The Enduring Elixir of Economic Growth

Xavier Sala-i-Martin on the wealth and poverty of nations

Brian Snowdon

> What makes some countries rich and others poor? Economists have asked this question since the days of Adam Smith. Yet after more than two hundred years, the mystery of economic growth has not been solved.
>
> Elhanan Helpman (2004)

> If we want to understand why countries differ dramatically in standards of living we have to understand why countries experience such sharp divergences in long-term growth rates…. Economic growth is the part of macroeconomics that really matters.
>
> Robert Barro and Xavier Sala-i-Martin (2003)

Introduction

Xavier Sala-i-Martin is widely recognised as one of the world's leading economists in the field of economic growth. Since 1990, he has made numerous theoretical and empirical contributions to growth analysis, recognised by numerous awards, fellowships, and research grants.[1] He is also the co-author, with Robert Barro, of *Economic Growth* (2003), *the* leading graduate textbook in the field.

Xavier Sala-i-Martin is Professor of Economics, Columbia University, USA. Brian Snowdon is Principal Lecturer in Economics at Newcastle Business School, Newcastle upon Tyne, UK.

[1] Details of Professor Sala-i-Martin's publications and professional activities can be found at his personal (and magnificently entertaining!) webpage: http://www.columbia.edu/~xs23/home.html.

Educated at the Universitat Autònoma de Barcelona, and Harvard University, Professor Sala-i-Martin has taught at Yale (1990–96), and Columbia (1996–to date), where he is currently Professor of Economics. He is also a Visiting Professor at Barcelona's Universitat Pompeu Fabra (1994–2005), and was Visiting Professor at Harvard University in 2003–04.

Among his many professional activities, Professor Sala-i-Martin has been a consultant to the IMF and World Bank (since 1993), and Senior Economic Advisor to the World Economic Forum (since 2002). In 2002 he founded the 'Umbele Foundation: A Future for Africa'. Professor Sala-i-Martin is a Research Fellow at the Centre for European Policy Research, London, the Institute for Policy Research, Washington D.C., and the National Bureau of Economic Research, Cambridge, Massachusetts. He is also Associate Editor of the prestigious *Journal of Economic Growth*.[2]

In the interview that follows, I discuss with Professor Sala-i-Martin several important issues relating to economic growth and development. First, to provide some background to the interview, I review the historical context of recent research.

The elixir of economic growth

The power and importance of economic growth in raising living standards is perhaps best illustrated by the history of the twentieth century. Despite two devastating World Wars, the Great Depression and collapse of international integration during the interwar period, and the rise and fall of the communist experiment, the *majority* of the world's population are better off than their parents and grandparents in terms of income per capita ($PPP). If the worldwide dramatic gains in life expectancy are also taken into account, there has been a remarkable improvement in welfare (see Maddison, 2001; Becker *et al.*, 2003; Crafts, 2003; Komlos and Snowdon, 2005). In McCloskey's (1994) words:

> No previous episode of enrichment approaches modern economic growth; not China or Egypt in their primes, not the glory of Greece or the grandeur of Rome.

[2] The *Journal of Economic Growth*, first published in 1997, is designed to serve as the main outlet for theoretical and empirical research in economic growth and dynamic macroeconomics.

Economic growth, not redistribution, is *the* single most powerful mechanism for generating long-term increases in income per capita. It will also act as the main source of divergences in living standards if growth rates differ across the regions and countries of the world. Over very short time horizons, the gains from moderate economic growth are often imperceptible to the beneficiaries, but the gains in the long run are highly visible. It is hardly surprising, then, that for many economists, to understand the causes of economic growth is far more important than gaining a better understanding of business cycles. As Barro and Sala-i-Martin (2003) argue, 'If we can learn about government policy options that have even small effects on long-term growth rates, we can contribute much more to improvements in standards of living than has been provided by the entire history of macroeconomic analysis of countercyclical policy and fine tuning'. Although Keynes (1930) is normally associated with his work on short-run macroeconomic issues, at the beginning of the Great Depression, the worst business cycle in the history of capitalism, we find him reminding contemporary observers that they should not be blind 'to what is going on under the surface—to the true interpretation of things…the power of compound interest over two hundred years is such as to stagger the imagination'.

Modern economic growth in historical perspective: extensive vs. intensive growth

As Maddison's data (Table 1) show, prior to the modern era living standards for the vast majority of the World's population progressed at a glacial pace. Reflecting on the 'Economic Possibilities of Our Grandchildren', Keynes (1930) commented that:

> From the earliest times of which we have record… there was no very great change in the standard of life of the average man living in the civilised centres of the earth…This slow rate of progress, or lack of progress, was due to two reasons—to the remarkable absence of important technical improvements and to the failure of capital to accumulate.

As the numerous growth models reviewed by Barro and Sala-i-Martin (2003) show, capital accumulation and technology play a central role in the analysis of the causes of growth.

Table 1: Level[1] and rate of (intensive) growth[2] of GDP per capita: world, major regions, and selected countries, 1–2001 A.D.

Region	1[1]	1000[1]	1820[1]	2001[1]	1–1000[2]	1000–1500[2]	1500–1820[2]	1820–70[2]	1870–1913[2]	1913–50[2]	1950–73[2]	1973–2001[2]
Western Europe	450	400	1,204	19,256	–0.01	0.13	0.14	0.98	1.33	0.76	4.05	1.88
UK	–	–	1,706	20,127	–	–	0.27	1.26	1.01	0.93	2.42	1.86
France	–	–	1,135	21,092	–	–	0.14	1.01	1.45	1.12	4.04	1.71
Germany	–	–	1,077	18,677	–	–	0.14	1.08	1.61	0.17	5.02	1.60
Italy	–	–	1,117	19,040	–	–	0.00	0.59	1.26	0.85	4.95	2.10
Western off-shoots[3]	400	400	1,202	26,943	0.00	0.00	0.34	1.41	1.81	1.56	2.45	1.84
USA	–	–	1,257	27,948	–	–	0.36	1.34	1.82	1.61	2.45	1.86
Japan	400	425	669	20,683	0.01	0.03	0.09	0.19	1.48	0.88	8.06	2.14
Latin America	400	400	692	5,811	0.00	0.01	0.16	–0.03	1.82	1.43	2.58	0.91
Eastern Europe	400	400	683	6,027	0.00	0.04	0.10	0.63	1.39	0.60	3.81	0.68
Former USSR	400	400	688	4,626	0.00	0.04	0.10	0.63	1.06	1.76	3.35	–0.96
Asia (excluding Japan)	450	450	577	3,256	0.00	0.05	0.00	–0.10	0.42	–0.10	2.91	3.55
China	–	–	600	3,583	0.00	0.06	0.00	–0.25	0.10	–0.62	2.86	5.32
India	–	–	533	1,957	0.00	0.04	–0.01	0.00	0.54	–0.22	1.40	3.01
Africa	430	425	420	1,489	0.00	–0.01	0.00	0.35	0.57	0.92	2.00	0.19
World	445	436	667	6,049	0.00	0.05	0.05	0.54	1.30	0.88	2.92	1.41

Source: Adapted from Maddison's tables, http://www.ggdc.net/Maddison
[1] Measured in 1990 Geary–Khamis international dollars.
[2] Annual average compound growth %.
[3] USA, Canada, Australia, New Zealand.

Since an increase in real GDP can either be absorbed by an increase in population, or lead to an increase in per capita income, it is important at the outset to distinguish between *extensive* and *intensive* growth. Extensive growth is a situation where an increase in GDP is fully absorbed by population increase, with no upward trend in per capita income (see Figures 1 and 2). Galor and Weil (2000) refer to this as a 'Malthusian Growth Regime'. The pre-modern world economy was not characterised by persistent stagnation. The fact that for thousands of years the world's population increased, even if 'glacially slowly', is evidence of extensive growth. If we assume that for the vast majority of people, subsistence living was the norm, then a larger population is only possible if total output also rises (Kremer, 1993). So extensive growth has been 'fairly common' throughout human history.

In contrast, intensive growth is where GDP growth exceeds population growth, allowing a sustained rise in living standards as measured by real income per capita. Periods of intensive growth have usually been preceded by a long period of extensive growth, often lasting several centuries, and the significant 'turning point' for any economy is the period of transition from extensive to intensive growth. However, throughout most of human history the possibilities for sustained intensive growth in predominantly agrarian (organic) economies were extremely limited. The availability and productivity of land determined the amount of extensive growth, but once the supply of suitable agricultural land was exhausted, diminishing returns set in. When these forces are combined with Malthusian population dynamics it is hardly surprising to find that many classical economists predicted the inevitability of a long-run stationary state involving subsistence standards of living for the vast majority of humanity.

Eric Jones (1988) distinguishes between two forms of intensive growth, namely, 'Smithian growth' and 'Promethean growth'. Smithian intensive growth relies on the gains to productivity that can be made from the division of labour, specialisation and trade. Such growth must eventually run into diminishing returns, as there are limits to the gains from resource reallocation. In contrast, Promethean intensive growth is sustainable, being driven by technological progress and innovation, and lies at the heart of the 'capitalist growth machine' (Baumol, 2002). It was in the latter part of the eighteenth century that we begin to see the emergence of Promethean

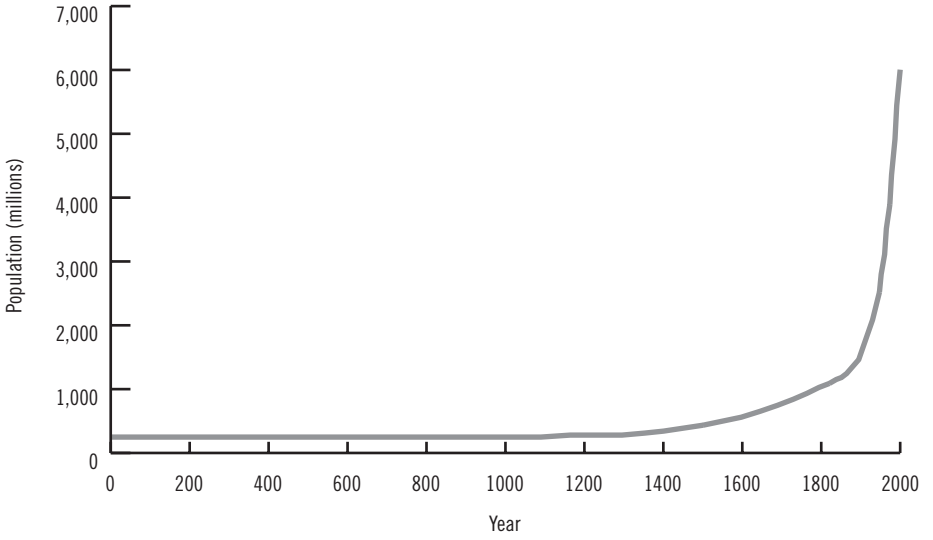
intensive growth in Britain with the coming of the Industrial Revolution. Why did Promethean growth first emerge at this specific point in history, and, in this specific geographical location, i.e., Britain? This is the billion-dollar question that many economists and economic historians have tried to answer (see, for example, Landes, 1998; Pomeranz, 2000; Jones, 2001; Mokyr, 2006).

The phenomenon of intensive Promethean growth represents a distinctive 'regime change' and several economists have recently argued that any story of the growth process, in addition to accounting for the modern experience of sustained intensive growth, should also be able to account for the long period of Malthusian stagnation (see Snowdon and Vane, 2005).

Since the middle of the eighteenth century, human history has been dominated by the emergence and impact of the first 'Industrial Revolution'. In the eighteenth and nineteenth centuries, economic growth was largely confined to a small number of countries, but gradually, modern economic growth spread from its origins in Great Britain to Western Europe, and initially to 'Western Offshoots' (overseas areas settled by European migrants; Maddison, 2001). As Figures 1, 2 and 3 indicate, even though world population has exploded during the last 250 years, *average* world living standards, measured by GDP per capita, have shown a marked improvement, and this achievement is due to the dramatic acceleration of world growth rates of per capita GDP. However, because the diffusion of the modern economic growth regime during the last 250 years has been highly uneven, and, in some cases, such as sub-Saharan Africa, negligible, the result is a current pattern of income per capita differentials between the richest and poorest countries of the world that almost defies comprehension. For example, the most recent World Bank data for 208 economies show that in 2004, Luxembourg (Rank 1) had a Gross National Income per capita (PPP) of $61,220, the USA (Rank 2) had $39,710, and the UK (rank 13) had $31,460. At the other end of the scale, Nigeria (Rank 193) had a GNI per capita (PPP) of $930, Ethiopia (Rank 200) had $810, and Malawi (Rank 208) had $620! Such huge disparities in living standards are a recent historical phenomenon.

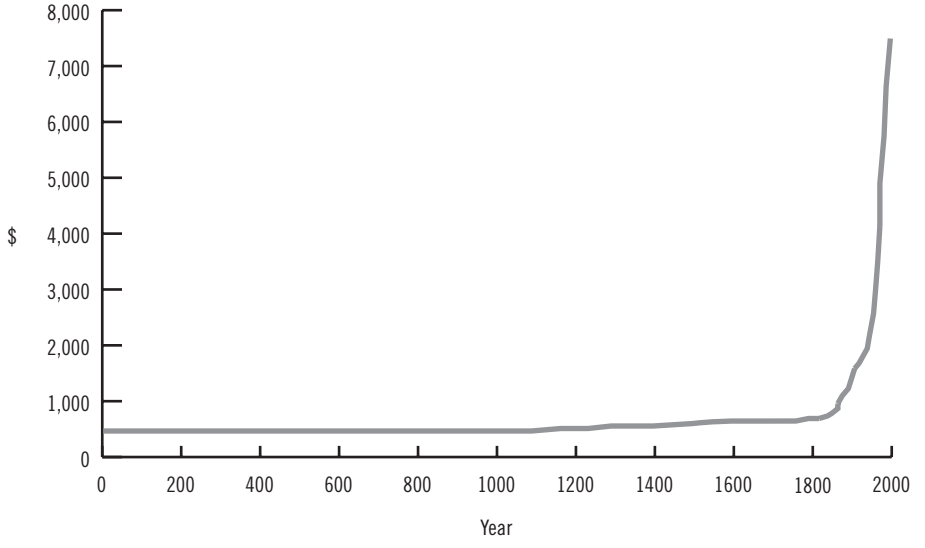
But it is not all bad news. Sala-i-Martin's recent research demonstrates that, especially during the last twenty-five years, significant improvements in living standards via growth have now spread to other heavily populated

Figure 1: World population over time



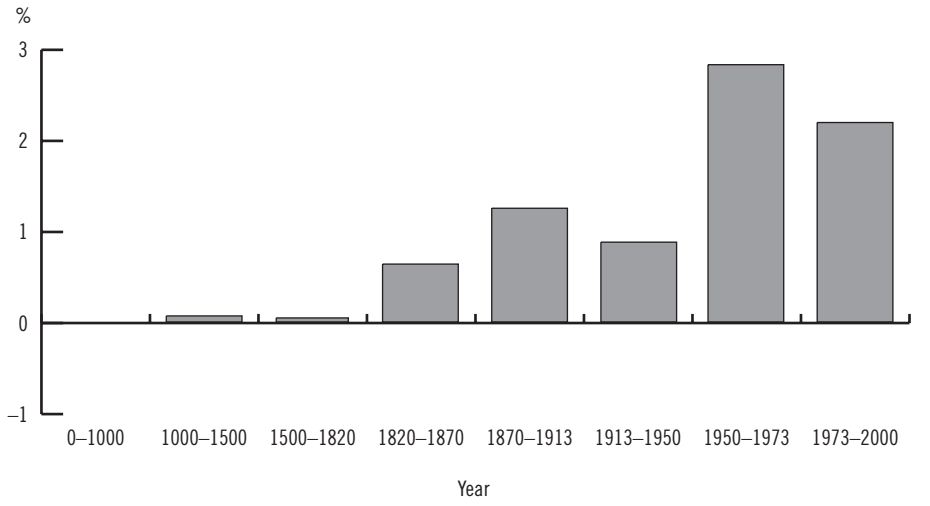
Source: Based on Maddison's data, http://www.ggdc.net/Maddison/

Figure 2: World per capita GDP over time



Source: Based on Maddison's data, http://www.ggdc.net/Maddison/

Figure 3: World per capita GDP over time: growth rates



Source: Based on Maddison's data, http://www.ggdc.net/Maddison/

parts of the world, most significantly to China and India (two countries with a combined population of 2.3 billion people). This is now having a dramatic impact on reducing world poverty *and* inequality (see Sala-i-Martin, 2002a, 2002b, 2002c, 2006). The main tragedy remains sub-Saharan Africa and 'there should be no doubt that the worst economic disaster of the twentieth century is the dismal growth performance of the African continent' (Artadi and Sala-i-Martin, 2003).

The importance of economic growth as a basis for improvements in human welfare and poverty reduction cannot be overstated, and is confirmed by numerous empirical studies (Dollar and Kraay, 2002). There is no better demonstration of this fact than the impact on living standards since 1960 of the comparative growth experiences of the 'miracle' East Asia economies with those of the majority of sub-Saharan African economies. Growth theory suggests that poor countries have enormous potential to 'catch up' through rapid growth. So, in many ways, the 'miracle' rapid growth of East Asia is much less of a puzzle to economists that the stagnation of sub-Saharan Africa.

Developments in growth theory and empirics

The classical economists, inspired by Adam Smith's *Wealth of Nations* (1776), gave prominence to the issue of economic growth. An important message from Smith is that 'little else is requisite to carry a state to the highest degree of opulence from the lowest barbarism, but peace, easy taxes, and tolerable administration of justice'. In contrast, the growth models of Thomas Robert Malthus and David Ricardo, each for different reasons, generated pessimistic conclusions with respect to the possibility of long-term growth of living standards. Karl Marx's model of capitalist development also predicted doom and gloom for the working classes. But, as Maddison's data confirm (see Table 1), Smith was right concerning the capacity of successful capitalist market economies to generate sustained increases in living standards. The real income and life style of the working classes in the leading capitalist economies has been transformed beyond belief (see Clark, 2005).

The post WWII scholarly interest in economic growth peaked in the 1950s, before declining markedly throughout the 1960s, 1970s, and early 1980s. Following the stimulating and important papers of Moses Abramovitz (1986), William Baumol (1986), Paul Romer (1986, 1990), and Robert Lucas (1988), this trend reversed itself abruptly after the mid-1980s. Since then, a surge of publications on economic growth, that shows no sign of letting up, indicates that the study of long-run economic growth is once again a very important research area for economists. Notable contributions have been made by several economists who, during the 1970–85 period, did seminal research in the business cycle field, in particular, Robert Lucas, Edward Prescott, Robert Barro, and Gregory Mankiw (see Snowdon and Vane, 2005). This reorientation of economists' research emphasis was long overdue and was stimulated by several factors, in particular:

1. new theoretical insights inspired by the 1980s research of Paul Romer and Robert Lucas, and, more recently, by the modern political economy analysis of economists such as Daron Acemoglu and his co-authors (Snowdon, 2004; Acemoglu and Robinson , 2006);

2. the availability of a rich array of new data sets for a large number of countries (e.g. Summers and Heston, 1991; Maddison, 2001), combined with innovative empirical research (Barro, 1991; Barro and Sala-i-Martin, 1991, 1992a);
3. a growing realisation that a large number of developing countries, particularly in sub-Saharan Africa, were not displaying 'catch up' tendencies with the levels of income per capita of the rich OECD economies (Baumol, 1986; Romer, 1986, 1994);
4. the sudden and unexpected collapse of the Soviet Union and other 'Eastern Bloc' economies at the end of the 1980s focussed economists' attention on economic reform processes, and the relationship between social, political and economic institutions (Desai, 2006); there is now widespread acceptance of the idea that 'good' governance and institutions are crucially important pre-conditions for successful growth and development (North, 1990; World Bank, 1997, 2002; Rodrik, 2006);
5. increasing concern, especially within the United States during the 1980s, that the economic position of the US relative to other major OECD economies, especially Japan and Germany, was being eroded (Thurow, 1992); during the last decade, China-phobia seems to have replaced the earlier phobias relating to Japan and Europe;
6. concern relating to the causes of the productivity growth slowdown, beginning in the late 1960s/early 1970s, but not clearly recognised until the early 1980s (Fischer *et al.*, 1988); more recently, in the late 1990s interest in the US has focussed on a productivity acceleration associated with the emergence of an information technology driven 'new economy' (Crafts, 2004);
7. increasing awareness of problems relating to the measurement of economic growth and that the true rate of progress is likely to be 'substantially underestimated' using conventional estimation techniques (Fogel, 1994, 1999; 2004; Nordhaus, 2001; Becker, *et al.*, 2003);
8. growing awareness of the spectacular growth performance displayed by the 'East Asian Tiger' economies as well as the 'growth disasters' and disappointments experienced in many developing economies, especially in sub-Saharan Africa, Latin America and Southern Asia (World bank, 1993; Artadi and Sala-i-Martin, 2003);
9. the increasing influence, during the 1980s, of the real business cycle approach to the study of economic fluctuations where the Solow

neoclassical growth model is used as the benchmark for studying both fluctuations and growth; real business cycle theorists argue that the growth process has a large random element and consequently aggregate instability is a manifestation of the stochastic growth process (Prescott, 2004);

10. for many economists, such as Robert Lucas (2003), Edward Prescott (2004), and Barro and Sala-i-Martin (2003), the renewed interest in growth stems in large part from their belief that business cycle fluctuations, of the magnitude experienced during the second half of the twentieth century, are not very costly to society, therefore it is far more important for economists to concentrate their research efforts on how to increase the rate of growth. Indeed, an obsession with short-run stabilisation could adversely affect long-term growth prospects.

Four waves of growth theory

Four main waves of growth theory were influential in the second half of the twentieth century, namely:

1. the neo-Keynesian Harrod–Domar model;
2. the Solow–Swan neoclassical model;
3. the Romer–Lucas inspired endogenous growth models;
4. modern political economy models.

The first three approaches emphasise the *proximate* determinants of growth. Interestingly, in each case the ideas developed represent examples of multiple discovery. The first wave of interest focussed on the neo-Keynesian work of Roy Harrod (1939, 1948) and Evsey Domar (1946, 1947). In the mid 1950s, the development of the neoclassical growth model by Robert Solow (1956, 1957) and Trevor Swan (1956) stimulated a second, more lasting and substantial wave of interest, which, after a period of relative neglect between 1970 and 1986, has been reignited (Mankiw, 1995). The third and most recent wave, initiated by the research of Paul Romer (1986) and Robert Lucas (1988), led to the development of endogenous growth theory, which emerged in response to perceived theoretical and empirical deficiencies associated with the neoclassical model (see Romer, 1994; Barro and Sala-i-Martin, 2003; Snowdon and Vane, 2005).

In the most recent wave of growth theory and empirics, modern political economy models have been used to investigate the *deeper* or *fundamental* determinants of growth. This research focuses on the impact on growth of such factors as the quality of governance, legal origins, ethnic diversity, democracy, trust, corruption, and institutions in general (for example, Zak and Knack, 2001; Glaeser and Shleifer, 2002; Landau, 2003; Acemoglu and Robinson, 2006). Major debates relating to the deeper determinants of growth also consider the relative importance of geographical constraints (Bloom and Sachs, 1998; Sachs, 2005), the natural resource curse (Sala-i-Martin and Subramanian, 2003), and the links between international economic integration and growth (Sachs and Warner, 1995; Bhagwati, 2004; Wolf, 2004).

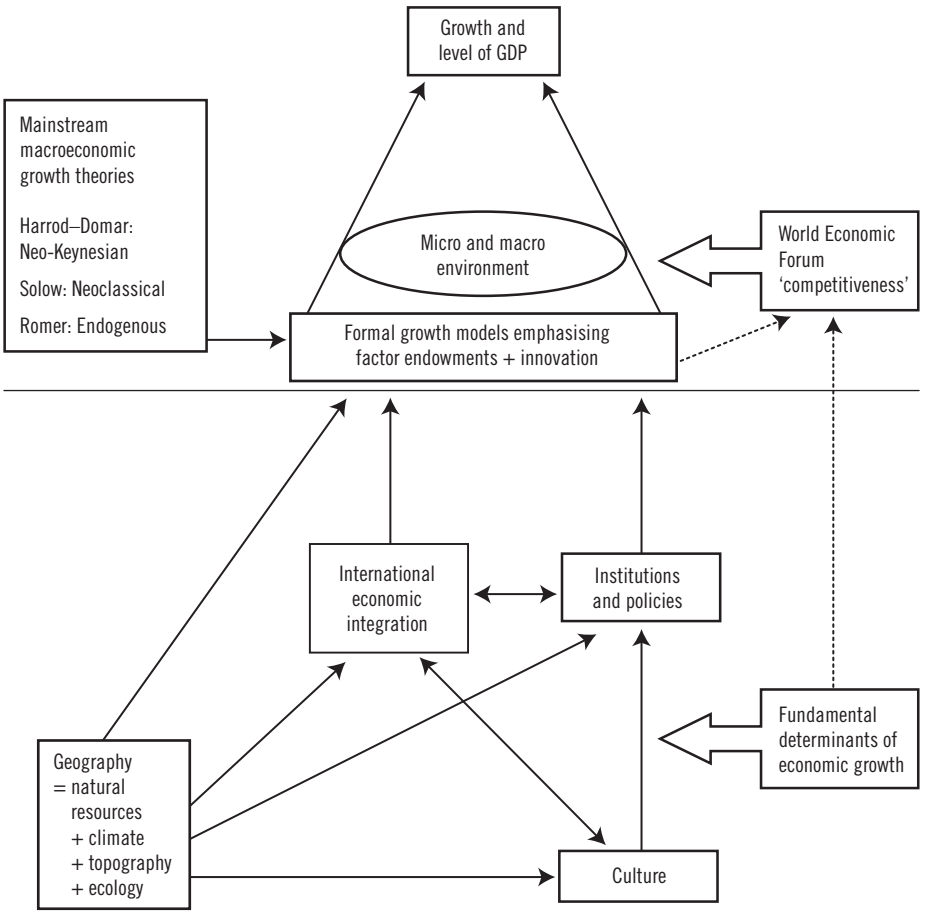
Figure 4 provides a suggested framework for thinking about the major proximate and fundamental (deeper) factors that influence the rate of growth.

While growth theory and empirical research show that poor countries have enormous *potential* for catch-up and convergence, these advantages will fail to generate positive results on growth in countries with an inadequate growth supporting institutions (Rodrik, 2003, 2006).

Conditional convergence: The Barro–Sala-i-Martin hybrid growth model

If all economies were intrinsically the same in terms of factors such as savings rates, preferences, access to technology, and population growth, then according to the neoclassical growth model, poor countries should grow faster than rich countries because of diminishing returns to capital accumulation (Barro, 1997; Sala-i-Martin, 2002d). This would result in *absolute convergence* of living standards. However, in a heterogeneous world, the growth rates of poor countries may be high or low depending on their initial per capita GDP *relative* to their long-run steady state positions, which are determined by savings rates and the other key variables. That is, we should expect to see in the data evidence of *conditional convergence* (Barro, 1997). The research of Barro and Sala-i-Martin (1991, 1992a, 1992b, 2003) finds strong and robust support across countries and regions for the neoclassical growth model's prediction of conditional convergence.

Figure 4: A framework for growth analysis



Source: Adapted from Snowdon and Vane, 2005.

An important deficiency of recent endogenous growth theories is that they do not predict conditional convergence. To rectify this flaw, Barro and Sala-i-Martin (1997) develop an interesting hybrid model that combines elements of endogenous growth theory with the convergence implications of the Solow model. Their model has the following elements:

1. in the long run, the rate of growth in the world economy is driven by technological discoveries in the leading economies;
2. follower economies share in the new innovations via a process of imitation;

3. since imitation is generally cheaper than innovation, 'most countries prefer to copy rather than invent';
4. the relatively low cost of imitation implies that the follower economies will grow relatively faster than the leader economies and converge, at least part way, towards the leaders;
5. as the amount of un-copied innovations decreases, the costs of imitation will tend to rise and therefore the follower's growth rate will tend to slow down;
6. in the long run 'all economies grow at the rate of discovery in the leading places'.

The Barro–Sala-i-Martin hybrid model therefore establishes an intuitively appealing framework where long-run growth is driven endogenously by the discovery of new ideas in the 'leading-edge' economies, but also retains the empirically supported convergence properties of the neoclassical growth model via the impact of the imitation behaviour of follower countries.

Analysing global competitiveness: sustaining growth and the power of productivity

Since 2002, Professor Sala-i-Martin has been a senior economic advisor to the World Economic Forum, best known for its annual meeting in Davos and the publication of its annual *Global Competitiveness Report*. The objective of the World Economic Forum's 'competitiveness' project is to provide a detailed assessment of the competitiveness of a large sample of nations. Prior to 2004, the Forum's *Global Competitiveness Report* analysed the competitiveness of nations using two alternative but complementary approaches. The first approach uses the medium to long-term macroeconomic oriented 'Growth Competitiveness Index' (GCI), developed by John McArthur and Jeffrey Sachs (2001). The second approach to measuring competitiveness utilises the 'Business Competitiveness Index' (BCI), developed by Michael Porter (Porter, 2001, 2005). Both the GCI and the BCI combine hard data with information gleaned from the World Economic Forum's Executive Opinion Survey of leading business executives and entrepreneurs from over 100 countries. Tables 2 and 3 provide a sample of GCI and BCI rankings from the most recent *Global Competitiveness Report, 2005–06*.

Table 2: Selected growth competitiveness rankings and components, 2005–06

Country	GCI rank 2005*	GCI rank 2004**	Technology Index 2005	Public Institutions Index 2005	Macroeconomic Environment Index 2005
Finland	1	1	2	5	4
USA	2	2	1	18	23
Sweden	3	3	4	17	12
Denmark	4	5	5	2	3
Taiwan	5	4	3	26	17
Singapore	6	7	10	4	1
Japan	12	9	8	14	42
UK	13	11	17	12	18
Germany	15	13	16	8	28
Korea Republic	17	29	7	42	25
Chile	23	22	35	22	15
Malaysia	24	31	25	29	19
Spain	29	23	27	36	24
France	30	27	24	20	27
Thailand	36	34	43	41	26
Hungary	39	39	30	34	63
South Africa	42	41	46	47	31
Italy	47	47	44	46	47
Botswana	48	45	76	39	36
China	49	46	64	56	33
India	50	55	55	52	50
Poland	51	60	39	64	53
Egypt	53	62	58	53	55
Mexico	55	48	57	71	43
Columbia	57	64	74	49	61
Brazil	65	57	50	70	79
Turkey	66	66	53	61	87
Tanzania	71	82	86	60	72
Argentina	72	74	59	74	86
Indonesia	74	69	66	89	64
Russian Fed.	75	70	73	91	58
Pakistan	83	91	80	103	69
Ukraine	84	86	85	90	78
Nigeria	88	93	90	98	76
Kenya	92	78	71	94	106
Bolivia	101	98	108	84	103
Ethiopia	106	101	115	79	108
Zimbabwe	109	99	98	80	117
Bangladesh	110	102	101	117	83
Chad	117	104	117	116	114

Source: Adapted from *The Global Competitiveness Report, 2005–06.*
* Full sample for 2005 = 117 countries.
** Full sample for 2004 = 104 countries.

Table 3: Selected business competitiveness rankings and components, 2005–06

Country	BCI rank 2005*	BCI rank 2004**	Company operations and strategy, 2005	Quality of national business environment, 2005	GDP per capita $PPP, 2004
USA	1	1	1	2	39,498
Finland	2	2	9	1	29,305
Germany	3	3	2	4	28,889
Denmark	4	7	4	3	33,089
Singapore	5	10	14	5	26,799
UK	6	6	6	6	28,968
Japan	8	8	3	10	29,906
France	11	12	10	11	27,913
Sweden	12	4	7	14	28,205
Taiwan	14	17	13	15	25,614
Malaysia	23	23	24	23	10,423
Korea Republic	24	24	17	24	21,305
Spain	25	26	25	26	23,627
South Africa	28	25	26	30	10,603
Chile	29	29	31	29	10,869
India	31	30	30	31	3,029
Hungary	34	42	40	32	15,546
Thailand	37	37	35	37	7,901
Italy	38	34	28	39	28,172
Poland	42	57	43	46	12,224
Brazil	49	38	32	52	8,328
Turkey	51	52	38	51	7,503
Botswana	55	62	76	50	10,169
Colombia	56	58	49	57	6,959
China	57	47	53	58	5,642
Indonesia	59	44	50	59	3,622
Mexico	60	55	55	62	9,666
Argentina	64	74	52	64	12,468
Pakistan	66	73	68	65	2,404
Kenya	68	63	60	69	1,075
Egypt	71	66	58	74	4,072
Russian Fed.	74	61	77	70	10,179
Ukraine	75	69	71	76	6,554
Nigeria	76	81	65	79	1,120
Tanzania	82	90	93	81	673
Zimbabwe	84	82	78	84	2,309
Bangladesh	100	95	99	101	1,875
Ethiopia	111	99	113	110	814
Bolivia	113	101	115	112	2,902
Chad	116	–	116	116	1,555

Source: Adapted from *The Global Competitiveness Report, 2005–06.*
* Full sample for 2005 = 116 countries. **Full sample for 2004 = 103 countries.

In addition to the GCI and BCI, the *Global Competitiveness Report 2004–05* introduces a new index of competitiveness developed by Xavier Sala-i-Martin and Elsa Artadi (2004). The new 'Global Competitiveness Index' aims to 'consolidate the World Economic Forum's work into a single index' that reflects the growing need to take into account a more comprehensive set of factors that significantly influence a country's growth performance.

The 'Global Competitiveness Index'

As noted in the *Global Competitiveness Report 2004–05*, the year 2004 represented a transition period, because future reports will begin to make use of a new single 'Global Competitiveness Index' (GLCI) that consolidates and extends the current dual-track approach involving the construction of the macroeconomic oriented GCI and the microeconomic oriented BCI. In constructing the new 'flagship' GLCI, Sala-i-Martin and Artadi (2004) take as their starting point a productivity based definition of competitiveness similar to the one recommended by Michael Porter's (2005):[3]

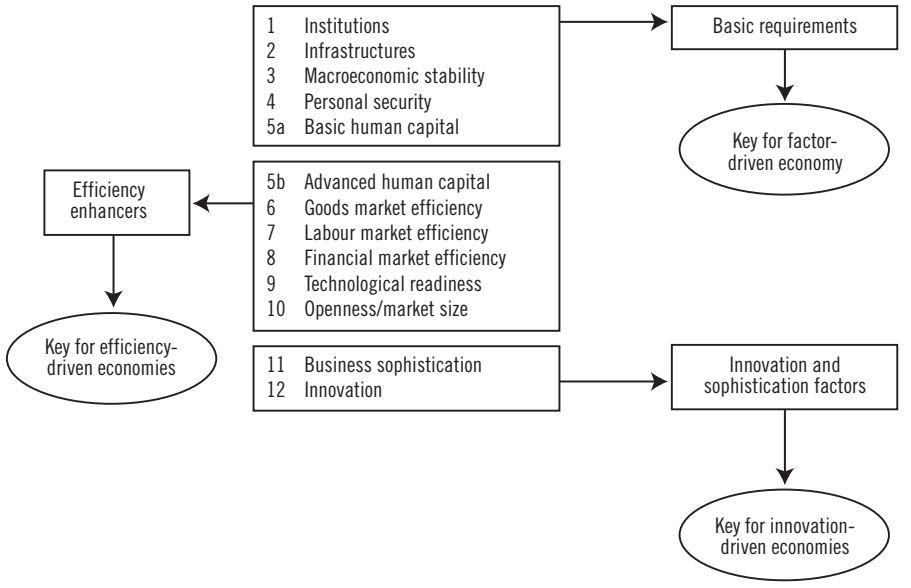
> Competitiveness is defined as the set of institutions, policies, and factors that determine the level of productivity. The level of productivity in turn, sets the sustainable *level* of prosperity that can be earned by an economy (and) a more competitive economy is one that is likely to *grow* at larger rates over the medium to long run.

In other words, productivity, as a measure of competitiveness, has both static and dynamic elements. Because the 2003 rank correlation between the GCI and BCI was 95.4 per cent, Sala-i-Martin and Artadi argue that 'the macroeconomic and microeconomic determinants of competitiveness cannot and should not be separated'. Consequently, the new GLCI is based on three basic principles:

Principle 1: The main determinants of productivity can be encompassed within twelve *pillars of competitiveness* and each pillar plays a major role, depending on the stage of development, in one of three broad areas, namely, 'Basic Requirements' (BR), 'Efficiency Enhancers' (EE), and 'Innovation and Sophistication' factors (IF). The GLCI is therefore a

[3] Emphasis added.

Figure 5: The twelve 'pillars' of the Global Competitiveness Index



Source: Adapted from Sala-i-Martin and Artadi, 2004.

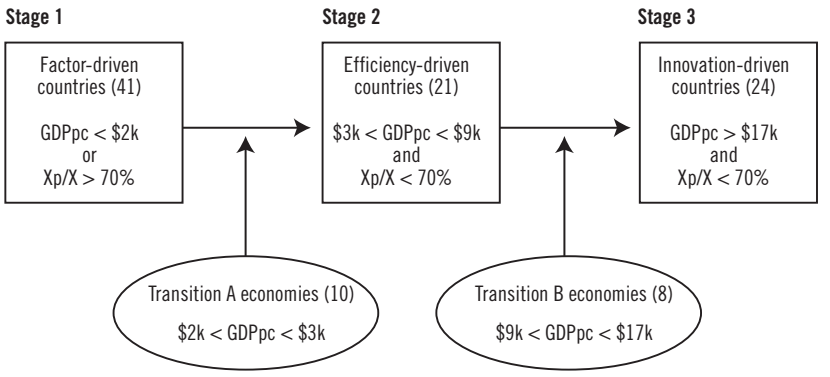
weighted composite index comprising these latter three elements, as follows:

$$GLCI = \alpha_1 BR + \alpha_2 EE + \alpha_3 IF, \quad \text{and } \alpha_1 + \alpha_2 + \alpha_3 \equiv 1$$

Figure 5 illustrates the components of Principle 1.

Principle 2: The process of economic development evolves in three stages, namely a factor-driven stage, an efficiency-driven stage, and an innovation-driven stage (Porter, 1990, 2005). The classification of countries, according to stage of development, is based on GDP per capita and the proportion of total exports in the form of primary commodities (Xp/X). While basic requirements, efficiency enhancers, and innovation factors play a role in all economies, they are given different weights in the construction of the GCLI, depending on a country's stage of development. The assignment of weights is as follows:

Figure 6: Five stages of development



At the '*Factor Driven Stage*' $\alpha_1 = 0.5, \alpha_2 = 0.4, \alpha_3 = 0.1$
At the '*Efficiency Driven Stage*' $\alpha_1 = 0.4, \alpha_2 = 0.5, \alpha_3 = 0.1$
At the '*Innovation Driven Stage*' $\alpha_1 = 0.3, \alpha_2 = 0.4, \alpha_3 = 0.3$

Principle 3: As economies develop they move smoothly from one stage to the next. Therefore, there are also two additional groups of *transition economies* and the weights of the sub-indexes 'change smoothly as a country develops'.

This overall framework, set out by Sala-i-Martin and Artadi (2004), is captured in Figure 6. Table 4 provides the 2005–06 Global Competitiveness Rankings for a range of countries representing each of the five country groupings.

The theoretical underpinnings of the GLCI reflect one of the main lessons to come out of over two hundred years of economists' thinking on the causes of economic growth. As Sala-i-Martin and Artadi (2004) note, 'The process of economic development is complex and many factors are needed for a country to succeed'. From 2006, the Global Competitiveness Index, developed by Sala-i-Martin and Artadi, is expected to become the main analytical tool in the World Economic Forum's research on competitiveness.[4]

[4] In the 2005–06 *Global Competitiveness Report*, the determinants of productivity are encompassed within 9 rather than 12 pillars of competitiveness, and the stages of development are defined in terms of GDPpc only.

Table 4: Selected global competitiveness rankings and components, 2005–06*

Country and stage of development	GCI** rank 2005	GCI*** rank 2004	Basic requirements	Efficiency enhancers	Innovation factors
USA (3)	1	1	18	1	1
Finland (3)	2	2	2	5	5
Denmark (3)	3	3	1	3	7
Singapore (3)	5	7	3	2	14
Germany (3)	6	6	8	19	3
Sweden (3)	7	5	7	9	6
Taiwan (B)	8	11	19	6	8
UK (3)	9	9	17	4	11
Japan (3)	10	10	25	17	2
France (3)	12	17	16	18	9
Korea Republic (B)	19	26	20	20	17
Malaysia (2)	25	23	26	25	25
Chile (2)	27	29	24	31	32
Spain (3)	28	24	28	27	28
Thailand (A)	33	33	34	41	38
Hungary (2)	35	46	49	30	39
Italy (3)	38	56	44	36	30
South Africa (2)	40	36	46	43	29
Poland (2)	43	72	57	38	45
India (1)	45	37	65	46	26
China (1)	48	32	45	62	48
Egypt (1)	52	47	53	68	71
Russian Fed. (2)	53	64	60	53	66
Argentina (2)	54	75	62	57	52
Brazil (2)	57	49	77	51	36
Colombia (A)	58	69	63	67	49
Mexico (2)	59	60	55	61	57
Ukraine (1)	68	73	74	64	60
Indonesia (1)	69	48	71	74	55
Turkey (2)	71	67	89	54	44
Botswana (2)	72	58	61	69	77
Nigeria (1)	83	77	78	90	72
Kenya (1)	93	84	108	83	51
Pakistan (1)	94	87	105	87	63
Bangladesh (1)	98	94	95	100	90
Tanzania (1)	105	97	103	105	88
Zimbabwe (1)	110	101	113	93	87
Ethiopia (1)	116	102	115	116	111
Chad (1)	117	103	117	117	116

Source: Adapted from *The Global Competitiveness Report, 2005–06.*
* A = Transition A Economy, and B = Transition B Economy
Full sample for 2005 = 117 countries. * Full sample for 2004 = 104 countries.

INTERVIEW[5]

Background information

How did you become interested in economics?

In high school I was unsure what to do, so I asked my parents …Who is the richest member of our family? It turned out to be one of my uncles, so I then asked … What did he study? He studied economics, so that's how I chose *(laughter)*.

Were there any people who during your student days particularly influenced the development of your thinking?

Yes, although I have to confess that I was not a very good student as an undergraduate because I did not find many of the subjects that interesting. However, I did very well in those areas that did interest me, in particular, microeconomics. At that time I was an undergraduate student at the Universitat Autònoma de Barcelona, and microeconomics was being taught by a Visiting Professor from the University of California, Davis. His name was Joaquim Silvestre, and he changed my way of thinking and the way that I saw economics. He really raised my interest in economic theory, first micro, then macro. I also enjoyed the mathematical approach to economic analysis. Because of Joaquim's influence, I then went on to Harvard where I met people like Jeff Sachs and Robert Barro and my interest gradually moved towards macroeconomics, development, and growth.

The renaissance of growth research

You have written a large number of influential papers in the field of economic growth[6] *as well as a very successful graduate textbook, co-authored with Robert Barro.*[7] *What is it about economic growth that fascinates you?*

[5] I interviewed Professor Sala-i-Martin in his office at Columbia University, New York, on 6th May, 2005.
[6] For example, Sala-i-Martin, 1990a, 1990b, 1994, 1997a, 1997b, 2006; Barro and Sala-i-Martin, 1991, 1992a, 1992b, 1992c, 1997; Mulligan and Sala-i-Martin, 1993, 2000; Roubini and Sala-i-Martin, 1992, 1995; Barro, Mankiw and Sala-i-Martin, 1995; Doppelhofer, Miller, and Sala-i-Martin, 2004.
[7] Barro and Sala-i-Martin, 2003.

To me the interest comes from the fact that economic growth is potentially so important for improving human welfare. I think that the most important question that an economist can ask is, What is it that makes a country grow? More than anything else it is economic growth that affects human welfare, including the discovery of an AIDS vaccine. Millions more people have died as the result of bad economic policies than have died of AIDS![8] It is also a very old question, since it is the one that Adam Smith set out to answer in his classic *The Wealth of Nations* (1776). This question remains unanswered even though many organisations, such as the World Bank, IMF, OECD, United Nations, and many policy advisors, act as if we economists did know the answer. I don't think that we do know with any certainty what we need to do in sub-Saharan Africa today to turn economic performance around. If you look at poverty eradication, something that also interests me, you do find that the countries that are successful in eradicating poverty are the countries that grow and vice versa.[9] So the absence of sustained growth has incredibly important consequences for human welfare and this is why it must remain a major research interest for economists.

Economic growth is crucially important and yet between the mid-1960s and mid-1980s, research into economic growth went into relative decline compared to other areas of macroeconomics.[10] *How do you explain this recession in the field, given its importance?*

I think the main reason is that many young economic theorists at American Universities are obsessed with math. The beauty of economic modelling is so attractive that some of the best young economists tend to focus on theorising in areas that are not always so important and relevant for the major problems facing the world. During the 1960s, the neoclassical revolution made growth theory highly mathematical and abstract. So many beautiful mathematical growth models were created but with results that were essentially irrelevant. The final product of a paper might be that a unique equilibrium for this particular model exists and everybody in the room would be very happy *(laughter)*. But the real world demanded

[8] The most extreme examples being the millions of lives lost as a result of policy-induced famines, for example, in the Soviet Union, 1931–34, 1947; China, 1959–61; Ethiopia, 1984–5; and North Korea, 1995–97.
[9] See the evidence presented in Dollar and Kraay, 2002.
[10] See Laband and Wells, 1998.

answers to important questions and so, beginning in the 1950s, there emerged an alternative, low-tech approach to providing answers, which we call 'development economics'. So interest in growth theory died for twenty years and discussions of growth were mainly confined within the field of development economics. But because development economics was not built on strong theoretical foundations, many of the answers it provided turned out to be wrong.[11] Then, in the early 1970s, new techniques associated with the equilibrium business cycle research of Robert Lucas, Thomas Sargent, Edward Prescott, Robert Barro and others were incredibly influential. This new methodology was very attractive to young economists just out of graduate school.[12] Macroeconomists became obsessed with business cycle theory during the 1970s and early 1980s. However, growth was reborn and today many macroeconomists see long-run growth as *the* major issue, much more important than the analysis of short-run fluctuations. Perhaps the most exciting aspect of the resurgence of interest in growth analysis has been the integration of theoretical and empirical research. In the new wave of research on economic growth, economists have taken economic theory more seriously when it comes to empirical research. A good example is the work on convergence.[13]

Growth and history

You mention the importance of empirical research, and obviously, such research requires good data. During the last quarter of the twentieth century, economists interested in economic growth have also had access to much improved data sets, notably the Heston–Summers Penn World Tables.[14] *Angus Maddison has also made some heroic attempts to estimate GDP per capita for a large sample of regions and countries going back 2000 years.*[15] *How much faith do you have in data sets that go back a long way into history?*

I don't think that the data are very reliable once you go back beyond 1960: data is a luxury good and only rich countries are likely to be able to collect

[11] See Krugman, 1997.
[12] See Snowdon and Vane, 1996.
[13] Barro, 1991; Barro and Sala-i-Martin, 1991, 1992a.
[14] The Penn World Table provides purchasing power parity and national income accounts converted to international prices for 168 countries for some or all of the years 1950–2000. For details go to http://pwt.econ.upenn.edu/
[15] Maddison, 2001.

reliable data. Once you start looking at poor countries, you need to have a large degree of imagination to collect data. Having said that, some of the lessons we get from these data sets are probably true, for example, the lessons on growing economic inequality (or divergence) between the 1760s and, say, 1980. Basically, the whole world was poor until about 1760, with the vast majority of people living on subsistence income. Regional differences in real GDP per capita were very small. The average income of a peasant in China was about the same as that of the average European serf or the average American or African farmer. From the beginning of organised agriculture until the mid-eighteenth century, Malthusian dynamics prevailed.[16] And then, around 1760, the Industrial Revolution arrived: initially, a small number of countries manage to take off, allowing them to experience sustained growth of per capita income for the next 250 years. The main distinguishing characteristic of the Industrial Revolution is not that incomes are higher, but that they grow continuously for the first time in human history. Because the spread of the Industrial Revolution is highly uneven, this led to the emergence of growing income inequalities between nations, which continued until about 1980. Fortunately, during the last two and a half decades, the process has been reversing as the majority of the citizens of the world are now experiencing rising incomes, especially as a result of the growth accelerations in China and India which together contain over 2.3 billion people, about 37 per cent of the world's population.[17] I think these big trends are correct, even though we do not have that much reliable data. However, I don't think we can tell with any real precision what the income per capita was in China or the United States, or anywhere else, in 1700, 1750 or 1820, never mind in 1100 AD.

One of the recent trends in the growth literature has been the attempt by many growth theorists to build models that can provide a unified explanation of the historical evolution of income per capita. Such models try to account for the Malthusian, post-Malthusian, and modern growth regime periods.[18] *Are you sympathetic to this recent work?*

[16] See Galor and Weil, 2000.
[17] See Sala-i-Martin, 2002a, 2002b, 2006.
[18] See, for example, Galor and Weil, 2000; Jones, 2001; Parente and Prescott, 2006.

This literature began with Michael Kremer's 1993 paper and the authors of these papers have produced some very innovative theories. But will we gain much from being able to explain from the same theory the stagnation of the pre-Industrial Revolution period, the Industrial Revolution take-off period, and the sustained growth of the post-Industrial Revolution era? I am not so sure.

Growth theory and empirics

Greg Mankiw has argued that 'whenever practical macroeconomists have to answer questions about long-run growth they usually begin with a simple neoclassical growth model'.[19] *To what extent is the Solow neoclassical growth model*[20] *still the central idea in the analysis of economic growth?*

The way that I look at theories or models is that they are tools that enable us to address particular questions. Relating back to your previous question, suppose we develop a theory that explains why, at a particular point in human history, income per capita starts to grow and people decide to reduce the number of children that they want. Such a theory is not much use if we want to answer questions such as, How do we get growth started in Malawi? Models address particular questions. The Solow model is an important framework for answering one very important question, namely: Is capital accumulation the key to economic growth? We do observe, by and large, that countries with high rates of growth have high investment–GDP ratios. For example, Africa has a poor record of growth, and has investment rates of about 5 per cent; the OECD grows at about 2 per cent with investment rates of about 20 per cent; and East Asia grows at 5, 6 and sometimes 10 per cent and has investment ratios at 30, 40, sometimes even 50 per cent. The Soviet Union also believed that investment would lead to growth. During the 1950s, Rostow's theory relating to the stages of development and 'take-off' into self-sustained growth was also based on increasing investment ratios.[21] Moreover, institutions like the World Bank claim that capital accumulation is the key to economic growth. In fact, the financing gap model (whose central element is that investment

[19] Mankiw, 1995, 2003.
[20] Solow, 1956, 1957, 2002.
[21] Rostow, 1956, 1960.

is the engine of growth) has guided official development aid for decades. Therefore, many economists believe that investment is a key variable in any explanation of economic growth. So the Solow model is an excellent tool for examining the importance of the relationship between capital accumulation and economic growth. The answer to that question is that if there are diminishing returns to capital accumulation, then increasing investment ratios are *not* the key. That is a very important insight.[22] An additional insight of the theory is that it leaves technological progress as the only long-run source of growth. Unfortunately, the Solow model *assumes* that technology is exogenous so it is obviously not a good tool for explaining technological progress. This is why theories of endogenous growth became so popular during the 1980s. The Solow model tells us nothing about why people have fewer children as their incomes increase: declining fertility is a very important phenomenon that occurs as an economy develops, but the Solow model has nothing to say about this.[23] The same applies to questions relating to the role of the financial sector and the importance of institutions in promoting growth. But the fact that the Solow model does not help us answer *all* economic development questions does not mean that it is not very useful for answering the questions for which it was designed. It is also a very simple tool, which means that it is easy to teach undergraduates the basics of growth theory. I suppose that is why it is the classic textbook model!

What are the most important lessons that economists have learned from the endogenous growth literature?

There have been various important insights from this literature. First, the endogenous growth literature attempts to deal seriously with important questions relating to technology. One major problem is this. In the classical world of Adam Smith we have classical goods that are both rival and excludable.[24] In this kind of world, the invisible hand and perfect competition lead to the best possible outcome. But technology is not a classical

[22] Robert Solow found this insight to be a 'real shocker' and 'not what I expected at all'. See Snowdon and Vane, 2005, p. 665.
[23] See Lee, 2003.
[24] A rival good is one where one person's use of that good reduces the availability of that good to other people. A non-rival good is one where one person's use of that good does not reduce the availability of that good to other people. A good is excludable if it has the property that people can be prevented from using the good. While all goods are either rival or non-rival, the degree of excludability can vary considerably.

good. Once someone invents a formula, everyone can use that formula at the same time and they can all use the formula as many times as they wish. Technology is a non-rival good. Take the example of a vaccine. The formula for the vaccine has to be invented and this can be a very expensive process because there is a large fixed cost. But once we know the formula many people can use it. In the case of perfect competition, we will not get an optimal outcome because prices converge to marginal cost and, consequently, there is no surplus to pay for the initial research cost. Therefore, in a world of perfect competition, very few things will be invented! Adam Smith's invisible hand does not work in the case of ideas.[25] So we need to think about what kind of institutions we need to create the ideas that lead to technological progress which is the driving force behind long-run economic growth. That is a very interesting insight. A second important idea is the focus of research on various social interactions and institutions that allow markets to work. For example, there is now a vibrant literature that investigates the importance for economic growth of trust or the rule of law.[26]

These are things that Adam Smith emphasised.

Absolutely. No economy can work in a lawless environment. However, the question of how countries develop and can best improve their legal systems and institutions is complicated. For example, when one country tries to impose the institutions that work in one setting on another country, it does not always work. In fact, it really never works. Take the example of the imposition of institutions by the West in the countries of Africa when they gained independence. Initially, these countries began as parliamentary democracies, with either British or French rule of law. Five to ten years later, the democracies had disappeared and had been largely replaced with autocratic dictators. We need to think how we can develop Africa-specific institutions that will allow markets to operate efficiently, because we all know that, at the end of the day, the only way out of poverty is growth, and sustained growth can be generated only through markets. The solution to Africa's poverty is not debt forgiveness and more

[25] See Jones, 2006.
[26] See, for example, Zak and Knack, 2001; Glaeser and Shleifer, 2002; Glaeser *et al.*, 2004; Helpman, 2004; Acemoglu and Johnson, 2005.

aid. Targets for the rich nations to provide assistance to poor nations of 0.7 per cent of GDP are not very useful. None of the rich nations of the world has reached that position because of aid and debt forgiveness. They became rich through being successful market economies.[27]

But there are many variants of the capitalist market system. For example, China has also developed a unique institutional approach that has been very successful during the last twenty years.

Yes, and who would have imagined that a capitalist system without a predominance of private property would work. Certainly not Adam Smith. No reasonable economist would have imagined that this would be possible. But it helped China during the first years of their transition from communism. The Chinese developed their own institutions that allow markets to work and reach similar outcomes to a Western-style market economy with private property. Certainly, the market systems of Sweden, Hong Kong and the US are very different; they all have their own peculiarities, but they all work in their own way.[28] So we know that for economic success you need markets, but how you achieve those markets, and how those markets are regulated by the state, is open for debate. If you try and impose a US, or Chinese, or Swedish style of market system in Malawi, it will not work. Japanese-style capitalism is not going to work in Zambia. Each country needs to develop its own market supporting institutions. Every time a new region of the world takes off, they do so with an entirely different and often surprising set of rules and institutions. For example, compare the growth take-offs of the UK, Japan, the 'Asian Tigers', and China. We as economists could not imagine in advance that the Chinese model of capitalism would work. If Jeff Sachs, Andrei Shleifer, Robert Barro or Adam Smith had been economic advisors to China in 1979, they would not have advocated or advised the institutional path actually chosen by the Chinese leadership. They would have advocated Western-style reforms. Most likely, their advice would have led to failure.[29] The Chinese have come up with a new style of capitalism that surprised everybody and, so far, it

[27] See Barro, 1997.
[28] See Dore, Lazonick O'Sullivan, 1999; Shleifer *et al*., 2003.
[29] Dani Rodrik takes a similar position. See Rodrik, 2003, 2006.

works.[30] Even if we learn what are the key differences between Chinese, US, Swedish and Japanese-style capitalism, I do not believe that comparisons, such as the relationship between the origins of the legal system and subsequent economic success, will provide lessons that will help us answer the question of what we need to advise in Africa in order to promote sustained growth.

Growth, globalisation, and convergence

You mentioned earlier that a good example of the merging of theoretical and empirical work is to be found in the research on growth and convergence. You have made an influential contribution to this literature, especially during the early 1990s.[31] *Initially it was thought that the lack of evidence for the 'absolute convergence hypothesis'—that poor countries as a whole tend to grow faster than rich countries—was evidence in favour of the new endogenous growth theories and against the traditional neoclassical model.*[32] *However, your research with Robert Barro, and the paper by Mankiw, Romer and Weil* (1992), *made it clear that the neoclassical model predicts 'conditional convergence'. Has this hypothesis been confirmed in the data?*

Yes, I think so. There are many studies confirming conditional convergence, although the speed of convergence, at about 2 per cent per year, is slower than predicted by the neoclassical model with a capital share of 0.3. An important feature of the neoclassical growth model is the convergence property. This is the idea that the growth rate of per capita income will be inversely related to some initial level of income per capita. However, Solow's neoclassical growth theory predicts *conditional* convergence, that is, poor countries will tend to grow faster than rich countries only if they approach the same steady state. This requires rich and poor countries to have very similar preferences, population growth rates, and to have access to similar technology. Clearly this is not the case. In our research, we found strong evidence for conditional convergence in various data sets, providing diminishing returns set in slowly.[33]

[30] See Jeffrey Sachs's comments on China's institutions in Snowdon, 2005.
[31] For example, Barro and Sala-i-Martin, 1991, 1992a; Sala-i-Martin, 1990a, 1990b, 1996a, 1996b.
[32] See Romer, 1986; Rebelo, 1991.
[33] See Barro and Sala-i-Martin, 2003, for a survey.

While economists are in general pro-globalisation,[34] *we do observe considerable hostility towards globalisation from other social scientists, politicians, and large sections of the general public. To what extent is increasing international integration a powerful force promoting international convergence of per capita incomes?*

It is unquestionably a powerful force for convergence. There are five important aspects of globalisation, namely, the mobility of goods, capital, labour, and information, and the diffusion of technology. Look at the countries that have had a disastrous growth record and compare them with the countries that have experienced sustained steady growth or growth miracles. For example, compare sub-Saharan Africa's experience with East Asia. The US and Europe have sustained steady growth and are doing fairly well, Latin America has stagnated, and the Arab world is underperforming.[35] But when it comes to sub-Saharan Africa, you need to ask yourself the following question: Which of the five globalisation factors has arrived in Africa? What answer do you get? Is the problem of Africa that there is too much capital mobility and foreign direct investment? No. Not even Africans invest in Africa where private investment is less than 5 per cent of GDP. Is the problem that there is too much labour mobility? When people from Africa cross the straights of Gibraltar, Spain does everything it can to return them to Africa! Spanish people, on the other hand, can work in Germany, Belgium, or Sweden, for example, but Africans cannot freely move to Spain. Does Africa trade too much? No. If anything, the problem they have is that they are prevented from exporting to Europe and the US by our protectionism. In the US, Europe, and Japan we see these obscene agricultural subsidies that deter consumers in the rich countries from buying their products. Because of these subsidies, it is cheaper for people in many parts of Africa to buy agricultural products from the rich countries. This is crazy. So the idea that Africa suffers from too much trade is completely absurd. Does Africa have too much Western technology? No. In the West we have the anti-retroviral drugs that can help HIV-positive patients. We have the technology, and they cannot apply it because they have too few doctors and hospitals. Finally, information. Information is, perhaps, the only one of the five factors that moves easily

[34] See Sachs and Warner, 1995; Snowdon, 2002; Milanovic, 2003; Bhagwati, 2004; Wolf, 2004.
[35] See Artadi and Sala-i-Martin, 2002.

to Africa. That is the surprising thing when you visit Africa. You see people watching Real Madrid play Barcelona live on TV *(laughter)*. But you must agree with me that, of the five factors that define globalisation, information (as opposed to capital, labour, goods and technology) is the least important. Now ask the same questions about China. Take labour mobility. There are unlimited amounts of Chinese people working abroad. Moreover, there are numerous Chinese studying around the world. Take capital mobility. China has enjoyed a huge inflow of FDI. Take trade in goods. China has experienced export-led growth. Technology and information pour into China. There should be no doubt that globalisation helps countries to grow faster and catch up. I think that the experience of Africa and Asia over the last three decades has clearly demonstrated that globalisation is good, period. Numerous empirical papers try to estimate econometrically whether growth is positively correlated with openness.[36] Some papers show that openness is good for growth. Others show that this relation is weak. But none of them shows that this relation is negative. Given all of this, I do not think we can blame globalisation for what is going on in Africa. In fact, if you were to ask African political leaders what their opinion is of globalisation they will answer, What globalisation? We do not have globalisation!

Political barriers and the 'natural resource curse'

Given that capital and technology can migrate across political boundaries, the persistence of significant differences in the level of output per worker and lack of convergence suggests the presence of entrenched barriers to growth and development. Daron Acemoglu's recent research highlights the importance of political barriers to development.[37] *This work focuses on attitudes to change in hierarchical societies. Political elites deliberately block the adoption of institutions and policies that would help to eliminate economic backwardness. Acemoglu and Robinson* (2000) *argue that superior institutions and technologies are resisted because they may reduce the political power of the elite. Where there are abundant natural resource revenues to plunder by the politically powerful, this problem is likely to be a serious barrier to development.*

[36] For recent surveys of the literature on the relationship between openness, trade reform and economic performance, see Panagariya, 2004; Winters, 2004; Winters, McCulloch, and McKay, 2004.
[37] See Snowdon, 2004.

Yes, the political and economic elites in many poor countries certainly oppose the use of new technologies and they also oppose many reforms. Look at Nigeria, which by almost any measure has been a development disaster. If you look at the distribution of income for countries like Nigeria, you will see that eighty per cent of the population are making little or no progress, or even becoming worse off, and twenty per cent are doing very well.[38] In 2000, the richest 2 per cent of Nigeria's population had the same share of income as the poorest 55 per cent. So it is not surprising that the political elites do not want reforms that will threaten their wealth and power. Why change the legal system or the current arrangements for the distribution of oil revenues if it's working in your favour? Why introduce more competition and open up the economy when this will erode your power? Nigeria has had forty years of mismanagement under military rule. The natural resource curse in Nigeria's case has worked through the detrimental impact that oil revenues have had on domestic institutions and the consequent corruption and waste that has plagued Nigeria's economic and political history since independence. The oil revenues in Nigeria have fuelled rent-seeking activity which has adversely affected long-run growth of per capita income. In my paper with Arvind Subramanian, we show that Nigeria's per capita income between 1965 and 2000 did not increase, even though $350 billion of oil revenues were generated.

What can be done to reverse this cycle of failure?

Our proposal focuses on the management of the oil revenues. This should be taken out of the hands of government. We propose that all Nigerians should have a constitutional right to an equal share of the oil revenues. And this proposal would also apply to other countries suffering from a natural resource curse induced deterioration of institutions.

Religion, culture, and growth

Robert Barro has recently argued that empirical research by economists on the determinants of growth has neglected the influence of religion.[39] *Do you think that religion and culture have an important influence on economic growth?*

[38] See Sala-i-Martin and Subramanian, 2003.
[39] Barro and McCleary, 2003, 2005.

There are very few issues where I disagree with Robert but this is definitely one of them *(laughter)*. My reason for disagreeing is that you cannot explain something that changes rapidly with factors that do not change at all, or change only very slowly. In the nineteenth century, the first person to talk about religion and economic performance was Max Weber.[40] He believed that predominantly protestant countries would have superior economic performance compared to catholic countries because of differences between the protestant and catholic religions. He talked about the 'protestant ethic'. Obviously he was wrong because now there are many predominantly catholic countries that are as rich as protestant countries. There are many other examples that undermine the culture hypothesis. Many people at the beginning of the twentieth century believed that the future major powers in the world would be Argentina and Brazil, not the US. The reason for this line of argument was that the US was attracting many migrants who came from a cultural background that was not conducive to the spirit of capitalism. By this time, educated northern Europeans were migrating to Argentina. Of course today, Polish and Italian Americans are as rich as other groups. The English used to complain about the Irish. The Irish were characterised as lazy, always drinking, and would never become rich. But look at Ireland now. It is richer in per capita terms than the UK![41] So every time predictions are made on the basis of culture or religion they turn out to be wrong. We keep observing countries where all of a sudden income starts to grow even though culture and religion have stayed the same.

How does the East Asian miracle fit into this debate?

In the 1950s, many sociologists used to say Asia will always be poor. Buddhism and the Confucian philosophy were supposed to constrain the desire for material goods, and for capitalism to work effectively you need people who are motivated by the desire to accumulate material goods. So the analysis based on religion and culture predicted that Asia would always be poor. But as everybody now knows, during the last fifty years we have witnessed the remarkable 'miracle' growth of Japan, Hong Kong, Taiwan,

[40] Weber, 1904.
[41] World Bank data show that Ireland's GNI per capita for 2004 was 33,170($PPP) while the UK's GNI per capita was 31,460 ($PPP).

Singapore, South Korea, and, more recently, China. There has been a massive convergence of living standards between East Asia and the rich countries. Some now have a higher per capita income than many countries in Europe and the 'Western Offshoots'.[42] Now we hear the counter argument that this success is also down to culture and religion, because Asian people are submissive and non-conflictual and this allows capitalists to exploit the workforce! This sounds like Monday morning quarterbacking! Clearly there is a problem with these types of argument. Why all of a sudden did South Korea, Hong Kong, Singapore, Taiwan, Thailand or Malaysia start to grow without any change of religion? Why all of a sudden did China start to grow rapidly after 1978? China did not change its culture or religion in 1978, did it? China stagnated for hundreds of years then suddenly it started to grow. Why? To explain this dramatic change using religious and cultural variables you would have to find some dramatic change in those variables around 1978. And you will fail because nothing happened to religion or culture in China in 1978.

International inequality

You have written some widely cited papers on the issue of global poverty and inequality.[43] *In discussions outside of academia the concepts of poverty and inequality often become confused. Do you think that inequality matters so long as poverty is being effectively reduced?*

No. In my forthcoming *Quarterly Journal of Economics (2006)* paper I state clearly that in most cases I don't think that we should pay much attention to inequality, especially income inequality. Why do I say this? Well, inequality would go up if the rich become richer by 10 per cent and the poor become richer by 5 per cent. Is this a bad situation? No. Surely this is good because the poor have become better off. If inequality goes up because the rich become richer and the poor become poorer in absolute terms, then this might be something to worry about. Or we could imagine a situation where the rich become poorer and the poor also become poorer, but by an even greater amount. This would certainly be bad. In all three situations, inequality has increased but the implications are very different.

[42] See Maddison, 2001.
[43] See Sala-i-Martin, 2002a, 2002b, 2002c.

It follows that it is very important to look carefully at the data to see why inequality increases or falls. I also believe that measuring inequality just by using income is a bad idea. Imagine you have a situation where you have two brothers. One brother likes to work hard, the other does not like to work. One brother likes to study in order to improve his employment prospects, the other hates to study. They are both reasonable people. It just so happens that one of the brothers prefers to have as much free time as possible and spend his time walking on the beach, while the other works like crazy, and has a lot of material goods. In fact, they could be equally happy. Then along comes the government and guess what? It looks at the distribution of income, not happiness. It observes one rich brother and one very poor brother, as measured by income. So the government transfers some income from the rich brother to the poorer brother, who now ends up with leisure time, and similar income! Notice that, because the government cares about income as opposed to happiness, redistribution ends up creating more (not less) inequality.

Why are you writing papers on inequality if you do not think it to be that important?

My main objective is to estimate the world distribution of income, because many people claim that this is important and because it allows me to study the fraction of the population below certain levels of income, a phenomenon we usually call poverty. Once I have this distribution, it is easy for me to estimate measures of inequality so that people who care about it can have a sensible debate about its evolution.

There has been a huge output of research on the issue of world poverty and inequality during the last decade.[44] *What is your assessment of the current state of economists' knowledge about trends in poverty and inequality? What do the data tell us?*

The world is moving in the right direction. Poverty is clearly going down. The World Bank did not agree a few years ago but now they also estimate that poverty is falling. Some economists say that it is not all good news, because the improvements come mainly from China and India with

[44] See, for example, Bourguignon and Morrisson, 2002.

2.3 billion people. But this is not a legitimate criticism: to remove from the data the two largest countries, where poverty has declined, and then declare that poverty in the world is increasing, is not acceptable.[45] Would it make sense to remove Africa from the data and declare that poverty is falling even faster? Of course not, and notice that, if we did, we would be ignoring many less citizens than if we were to ignore China and India! In assessing trends in world poverty, we need to include all countries in the data set. When you do that, the results show that poverty and inequality across the world is falling. Some people say that if you look across *countries*, inequality is increasing. That may be true, but it is not relevant for human welfare because looking at countries, rather than citizens, would give 700 times more weight to the farmer in Mozambique than to a Chinese peasant, simply because the former lives in a smaller country! We need to look at population-weighted measures of poverty and inequality, because China has 1.3 billion people and Mozambique has about 19 million people.[46] We are interested in human welfare and we therefore have to look at individual income.[47] The implications for human welfare of rapid growth in India and China are much more important than the effect of rapid growth in poor countries with small populations. This does not mean that all we should be talking about is human welfare. In much of my research I talk about countries because I want to test theories. If we want to know which policies produce growth then we need to look at countries, because each country is an independent experiment and we can compare the outcomes of different strategies. So when you are asking questions about policies you must look at country data. If you want to talk about human welfare, you need to look at individual data. Every data set is useful for a particular question. It is a conceptual mistake to assume that because different data sets provide different impressions that this implies we do not know anything.

Can the growth tragedy of sub-Saharan Africa be reversed? If we could look at the data on international inequality at the end of the twenty-first century, is there some possibility that lower international inequality will include Africa?

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[45] See Wade, 2004a, 2004b.

[46] The population-weighted variance of the log of income per capita represents a better measure of inequality than the variance of the log of per capita income which gives the same weight to each country, no matter how large or small the population.

[47] The analysis of global inequality is further complicated by changes in inequality over time *within* countries. See Milanovic, 2002.

It is possible. But, as I said earlier, what Africa needs is not more aid and debt relief but better policies, more businesses, more trade, and more domestic and foreign direct investment.[48] The share of public spending in GDP also needs to be reduced.[49] The rich countries can also play a major role by allowing easier access of goods into their markets. Above all, sub-Saharan Africa needs peace and an end to violence and civil wars.

Foreign aid and growth

Throughout 2005, Jeffrey Sachs, Tony Blair, and Gordon Brown have argued in favour of increasing substantially the aid flows to developing countries, especially to sub-Saharan Africa.[50] *From what you have just said, you clearly have little sympathy for this strategy as a way of promoting growth and development.*

The plans to increase aid over the next decade might be very dangerous if the recipient governments are corrupt, and lack accountability. By promising billions of dollars in development aid over the next ten years, what you are saying to the leaders of such countries is that they have ten years to enrich themselves. Moreover, you are telling them that after ten years all the money will be gone. The Blair–Brown plan to solve the 'poverty trap' in sub-Saharan Africa, by bringing forward future aid allocations for the next thirty years to be allocated during the next decade, is, potentially, a recipe for theft on a grand scale.

So there is no case for agreeing with Jeff Sach's (2005) *call for aid to be increased to 0.7 per cent of GDP of the developed nations?*

No, I am not at all sympathetic to calls for more foreign aid until we find better ways to distribute it without causing harm.

Is this because of the governance problems?

No, governance is one important reason, but not the only one. My feeling is that aid also has perverse consequences on the allocation of talent in a

[48] See Artadi and Sala-i-Martin, 2003.
[49] See Doppelhofer, Miller, and Sala-i-Martin, 2004.
[50] See Snowdon, 2005.

developing country.[51] Foreign aid is a very important industry, more than 15 per cent of GDP, in many African countries. The existence of all this money may very well lead potentially productive citizens to move away from productive activities into the international aid industry. In other words, rather than becoming engineers, many kids may find it more economically advantageous to become part of the bureaucratic network that specialises in channelling international aid, with the potential to allocate money to friends and relatives. A third problem is that donors do not know how best to spend aid resources. But whatever the reason, it seems clear to me that over the last fifty years international aid has been largely wasted.[52] While international aid was increasing in Africa, the growth rate of income per capita was declining continuously. I think international aid has, by and large, failed to promote widespread economic development.

Jeffrey Sachs would probably say that this failure is because we did not give enough in aid…

Jeff is very articulate and persuasive and I have often heard him use a very appealing parable to describe this situation: "The fact that one fireman is unable to put out a big fire does not mean that we should send less firemen to the fire. We should send more"! This sounds very good and very appealing, but a careful reading of the growing evidence is that foreign aid has failed almost everywhere. After some research from the World Bank[53] showed that development assistance was positively related to growth, provided that it was given to governments that follow "good policies", subsequent research showed that aid does not generate growth even in those countries that follow good policies.[54] One reason is that the aid institutions, like the World Bank, the IMF and the United Nations, are getting it wrong. And they are getting it wrong because we, by which I mean economists, do not know what to do. Given our ignorance on this issue, the Gordon Brown plan, which consists of bringing forward 30 years worth of international aid to the next 10 years, may be a bit dangerous because there is no guarantee that increasing aid will work. In effect, we are going to bet thirty years of resources on the next ten years. This is a huge (and

[51] See Murphy, Shleifer and Vishny, 1991.
[52] See Easterly, 2003a, 2003b, 2004; Snowdon, 2003.
[53] See Burnside and Dollar, 2000.
[54] See Easterly, Levine, and Roodman, 2004.

perhaps irresponsible) gamble. An additional problem is that the obsession over the Millennium Development Goals might be counterproductive. The Millennium Development Goals are set for 2015. That is, ten years from now. Devoting all development strategies (which are essentially long-term strategies) to *only* achieve goals by 2015 may end up inducing political and economic leaders of the developing world to follow the wrong development strategies. In other words, it might be that the best strategy is to channel resources into activities that will produce benefits to Africa after 2015—but this is too late to achieve the Millennium Development Goals, so those activities will never be financed!

What kind of strategy should the rich countries be following to help Africa?

I am not sure, but I think that one of the priorities should be the financing of R&D that searches for solutions to the three pandemics: AIDS, Malaria and TB. The payoff from this would be huge (although it may well come after 2015). I like Michael Kremer's idea of a research fund to purchase vaccines at prices that exceed marginal cost.[55] Africa cannot do this alone because they do not have the technology, the doctors, and the pharmaceutical industry to carry out the necessary research. The rich world should do this. Other things rich countries should do is to promote business activity in Africa (which does not necessarily mean more financial aid). One way to develop this business activity is to reduce trade barriers (including agricultural subsidies).

Human capital and growth

In your discussion paper 'Fifteen Years of Growth Economics: What Have We Learnt' (2002d), *you note that the cross-country regression literature, which attempts to identify the empirical determinants of growth, does not find a strong relationship between 'most measures of human capital and growth'. Does that not surprise you?*

The Lucas 1988 paper stimulated a huge literature on the impact of human capital on growth. But when researchers started to measure human

[55] See Kremer, 2002; Kremer and Glennerster, 2004; Kremer and Snyder, 2004.

capital accumulation, they found that very few measures of human capital have a positive sign in regressions.[56] Human capital has been a disappointment. If you actually look at Robert Barro's regression, many human capital measures come with a negative sign! The one measure that does seem to be positively related to growth is investment in primary schooling. Neither university education nor secondary schooling seem to matter. This is important because for a while the World Bank and other institutions spent millions of dollars building schools and promoting investment in human capital. Unfortunately, this did not seem to translate into a positive impact on economic growth. Perhaps the wrong investments were made. Perhaps the key ingredient in the process of education is the productive use of student's time, not the school buildings or teachers salaries. But the main lesson from the human capital growth literature is that the results have been disappointing.

Geography and growth

In recent years, several economists, notably, Jeffrey Sachs, have revived the idea that geography has an important influence on economic performance.[57] *This literature emphasises the direct impact that geography can have through climate, natural resources, and topography. Such factors obviously influence the health of a population, agricultural productivity, the economic structure of an economy, transport costs and the diffusion of information and knowledge. Do you agree with Sachs that geography matters for economic growth?*

I think that we can all agree that geography matters, but there is disagreement on the channels of causation. How does geography matter? Jeffrey Sachs says that the link is direct: it affects through geographically related diseases, such as malaria, which is a tropical disease, and therefore geographically concentrated or geographically related productivities, for example, tropical weather is less amenable to certain types of high-yield agricultural products. Daron Acemoglu and his co-authors think that geography matters because it created the wrong kind of colonial institutions.[58] The Europeans were reluctant to settle in locations with high

[56] See Mulligan and Sala-i-Martin, 2000.
[57] See Bloom and Sachs, 1998; Sachs 2005; Snowdon, 2005. See also, Gallup, Gaviria, and Lora, 2003.
[58] Acemoglu, Johnson and Robinson, 2001, 2002. See also Acemoglu, 2003; Snowdon, 2004.

malaria incidence. So in those areas, the Europeans established extractive institutions that had long-lasting adverse effects. Jeff Sachs believes that there are additional direct effects on technology and the health of populations from adverse geography. But they all agree that geography matters. It is obvious that tropical countries have problems with tropical diseases such as malaria, and that there is a relative lack of research and development relating to their specific health and agricultural problems.

You argued earlier that increasing international economic integration and globalisation are powerful forces for convergence. Since trade is obviously influenced by transport costs, do you agree with Sachs that in many cases landlocked countries are at a particular disadvantage when it comes to achieving satisfactory economic growth? [59]

But the highest growth country in the world in recent decades has been Botswana, which is a landlocked country in sub-Saharan Africa! Switzerland and Austria are two of the richest countries in the world and they are also landlocked. About half of US states are landlocked. Vermont and Ohio are landlocked. Obviously this hypothesis has problems.

Botswana is landlocked but how much of its success is down to the discovery of diamonds in the 1960s?

The diamonds have been important but as you know, the possession of valuable natural resources does not always lead to economic growth. In fact, most countries that discover natural resources end up going down the tubes. They become victims of the 'natural resource curse'.[60] In the early 1960s diamonds were discovered in Botswana, and King Seretse Khama, who became Botswana's first President in 1965, did not to steal the diamonds as happened in other parts of sub-Saharan Africa, and he also maintained democracy. He made sure that the diamond revenues were diverted to useful investments. The strategy worked, and Botswana has not been a victim of the natural resource curse. Why? I don't really know, but it is a very big exception.[61] It is true that other landlocked countries

[59] See Faye *et al.*, 2004.
[60] Sala-i-Martin and Subramanian, 2003; Sachs and Warner, 2001.
[61] See Acemoglu, Johnson and Robinson, 2003.

like Chad, Niger, and the Central African Republic have been development disasters. But are they disasters because they are landlocked? The Democratic Republic of the Congo is largely landlocked, it has diamonds and other natural resources, so why has it not been able to grow like Botswana? And of course there are lots of poor countries that are not landlocked. Take the countries of Central America such as Guatemala, El Salvador, Honduras, Costa Rica, and Nicaragua. They have oceans on both the east and west sides of the country but they are poor! Somalia is not landlocked and neither are the poor countries of West Africa such as Liberia, Sierra Leone and Guinea. So I think the quality of economic policies, regulations, and other factors are a far more important explanatory factor of economic performance than whether a country is landlocked or not.

Perhaps Botswana has been more successful than resource-rich countries like Nigeria because it has had a more accountable democratic government?

That is true, but it remains to be explained why the government in Botswana did not become kleptocratic and steal the diamond revenues. Why was there no military coup after the diamonds were discovered? The diamond deposits are actually in Seretse Khama's own tribal territory. So the key question is: Why did Seretse Khama not behave like Mobutu Sese Seko in the Congo, or Sani Abacha in Nigeria, and transfer vast fortunes into a personal Swiss bank account? Unlike human capital or wages which are hard to steal, it is relatively easy for dictators of resource rich countries to enrich themselves. In rich democratic countries, when natural resources are discovered, good things tend to happen. Good examples are Norway and Britain after the discovery of North Sea oil. In poor countries, after the discovery of valuable natural resources, the norm is that terrible things happen.

Growth, and economic and political freedom

The impact of political institutions on economic performance is another area that has been receiving increasing attention from economists.[62] *Does the evidence support the idea that democracy is good for economic growth?*

[62] See Acemoglu and Robinson, 2005; Barro, 1996, 1997, 1999. See also Mulligan and Sala-i-Martin, 2004.

I agree with Robert Barro on this issue. There are lots of political dictatorships that have worked in terms of producing economic growth. China is the most recent example. But Singapore, Chile, Taiwan and South Korea have also had successful growth even though they have been dictatorships for much of their recent history. We also have many examples of successful democracies, including postwar Japan and Germany who experienced growth miracles during the 1950s and 1960s. There are also many examples of democracies and dictatorships that have been a disaster with respect to economic growth. In fact, most dictatorships have been disasters. The main point made in Robert Barro's research, and one that I completely agree with, is that democracy is not a critical factor for achieving growth. Let me be clear, this in no way suggests that dictators are a good idea. Remember, the correlation between growth and democracy is zero, not negative. However, for practical purposes, if you have $10 billion to spend in one country, and many things need to be created from scratch, then if the goal is to promote economic growth, democracy should not be the immediate priority. With a budget constraint, there are other projects that appear to be more important, such as investment in infrastructure, establishing law and order, or creating a vibrant business fabric.

The modernisation thesis suggests that growth and economic development are important pre-requisites for the establishment of a sustainable democracy. Do you think that growth promotes democracy?

This is the other part of Barro's story. Eventually, as people become rich, then they begin to demand democracy.[63] If you impose democracy on poor countries that are not ready, able, or willing to defend democracy, then it will invariably fail. This has happened many times. In the early 1960s, following the decolonisation process, most countries in Africa started out as democracies. By 1975, only one country was democratic! Military coups occurred everywhere, eliminating democracy.

[63] This is the so-called 'Lipset hypothesis', named after Seymour Lipset, 1959. 'From Aristotle down to the present, men have argued that only in a wealthy society in which relatively few citizens lived in real poverty could a situation exist in which the mass of the population could intelligently participate in politics and could develop the self-restraint necessary to avoid succumbing to the appeals of irresponsible demagogues' (Lipset, p. 75). For recent critiques of the Lipset–Barro hypothesis, see Feng, 2003, and Acemoglu, Johnson and Robinson, 2005.

Growth and competitiveness

The World Economic Forum's annual Global Competitiveness Report *analyses the competitiveness of nations.*[64] *Until recently, the Report used two alternative but complementary approaches to measuring competitiveness. The first approach uses the medium to long-term macroeconomic oriented 'Growth Competitiveness Index', developed by John McArthur and Jeffrey Sachs* (2001). *The second approach to measuring competitiveness utilises the 'Business Competitiveness Index', developed by Michael Porter* (2001, 2005). *In the Global Competitiveness Report, 2004–05, a new index of competitiveness, that you developed with Elsa Artadi* (2004), *made its debut. The new 'Global Competitiveness Index' aims to 'consolidate the World Economic Forum's work into a single index' that reflects the growing need to take into account a more comprehensive set of factors that significantly influence a country's growth performance. Michael Porter thinks that 'combining these two measures would suppress useful information'*[65] *while you seem to prefer a single index of Global Competitiveness. Why do you favour a single index of competitiveness?*

Michael Porter wants to separate static from dynamic influences, and micro from macro factors, in the construction of competitiveness indices. He thinks of the 'Growth Competitiveness Index' as a macroeconomic dynamic index, whereas he views his 'Business Competitiveness Index' as a static microeconomic index.[66] I think that conceptually it is very hard to distinguish between these influences on competitiveness. Both Porter and I define competitiveness in terms of productivity. There is no doubt that productivity determines the wealth of nations as Adam Smith so clearly pointed out in 1776. But productivity also determines the rate of return to investment, and so is a determinant of growth. Hence, the same concept, productivity, has both static and dynamic considerations. Also, it is difficult to decide what belongs in the realm of macro and micro. For example, take the rule of law which at the micro level obviously influences the effectiveness of business operations. But the rule of law is also an important factor in determining economic growth through its influence on institutions and regulations. So for me, it is very hard to distinguish the micro from the

[64] http://www.weforum.org/
[65] See Snowdon and Stonehouse, 2006.
[66] See Porter, 2005; Blanke, Paua, and Sala-i-Martin, 2004; Sala-i-Martin and Artadi, 2004.

macro and the static from the dynamic factors. All macro policies have micro consequences and all the decisions made at the micro level of the firm have macroeconomic consequences. That is why I prefer to use one 'Global Competitiveness Index'.

In developing your index you argue that the main determinants of productivity can be encompassed within twelve 'pillars of competitiveness' and each pillar plays a major role, depending on the stage of development. What led you to that approach?

I was influenced by Porter on this. He thinks in terms of stages of development. What competitiveness is for poor countries is not the same as competitiveness for rich countries. Porter distinguishes three levels of competitiveness. Poor countries are in the first stage of competitiveness where they compete through prices; you need to make things cheaply. For countries in the intermediate stage of development, they compete through quality—that is, you try to make things better than your neighbour rather than cheaper. For the developed countries, the key to competitiveness is innovation. This means that the factors that determine how cheap you can produce should be given more weight in countries that are poor than in richer countries. The factors that determine efficiency should be given more weight in intermediate countries, and the factors that drive innovation need to be given more weight in rich developed countries. Although the concept of stages of development appears in many of Porter's research papers, in his previous index all these factors are given the same weight. This means that a country like Zambia is penalised for not carrying out innovation. But I think that Porter would agree with me that, today, Zambia should not be pouring resources into innovation. Zambia needs to prioritise on other aspects. For example, it should integrate more with the rest of the world, reduce crime and guarantee property rights to produce an environment where enterprises can produce goods cheaply to sell on the world market. In contrast, if a country like Spain, which is quite a bit richer than Zambia, does not have a good record in R&D, it will be in trouble. The reason is that Spain can no longer compete with China by producing cheaper or better goods. Its only chance is, therefore, to do different or new things. That is, to innovate. Therefore, a competitiveness index should penalise Spain if it does not innovate. So all I did was to implement his idea of stages of development and assign

weights to the various factors depending on how important they are at each stage of development.

But how do you choose the weights?

Using maximum likelihood techniques I tried to find the weights that I would need, using my index, to explain the actual growth experience of countries during recent years.

Growth and happiness

In our earlier discussion relating to inequality you mentioned that what the government should be measuring is happiness inequality, rather than income inequality. What is your view of the recent literature on the economics of happiness?[67]

I had some interest until I read a paper which persuaded me to drop this literature *(laughter)*. In this paper, comparisons of happiness were being made across countries. This was done by comparing the level of income per capita plotted against a measure of happiness. The result was a curve showing an increasing but diminishing rate of increase of happiness with higher income per capita. The conclusion was that after you reach a certain level of income, then extra income does not bring much extra happiness. When I looked at the graph I noticed two things. First, happiness was measured on the vertical axis with an index number ranging between one and ten. People were asked how happy they were on a scale of 1–10. This is completely flawed, because if you are very happy and answer ten this year, and you are even happier in five years time, you can still only answer ten if you are very happy. You are not allowed to say eleven *(laughter)*. So the curve must be flat at the top… by construction! A further problem was that the 15 countries that were very poor, with low levels of happiness, were all former Soviet Republics. So I think that such measures do not really reflect happiness but *changes* in happiness relative to previous circumstances (former Soviet republics are countries that have deteriorated substantially over a very short period of time). Another puzzle to me is that

[67] See Easterlin, 2001; Kahneman *et al.*, 2004; Layard, 2005, Komlos and Snowdon, 2005. See also the discussion by Kahneman *et al.*, of the 'Day Reconstruction Method' of measuring well-being, in the December, 3, issue of *Science*.

it does not seem to matter which type of survey I see, Finland is always at the top. This suggests to me that different countries respond to surveys in different ways. Maybe in Finland it does not matter what is being asked, the answer will always be 10 *(laughter)*. So the Finns are supposed to be very happy and yet other evidence clearly conflicts with this. For example, they have one of the highest suicide rates in the world.[68] If they are so happy, why do so many Finns want to kill themselves?

Current research

What are your current research interests?

I am still working on problems of growth and development in Africa, trying to find out what the optimal economic policy strategy might be for each country. I am also trying to implement an idea related to the Umbele Foundation[69] that I helped to set up. I am looking at the issue of corporate responsibility and how firms can help Africa develop, not by giving money, but by actually moving to Africa and becoming associated with a particular town that wants to be helped. I think that we in the developed countries do not really listen to what the people in Africa want or need. But we don't have effective mechanisms for listening to what they say. Bill Easterly puts it brilliantly when he says that the market is generally a good instrument to achieve what people want. If a business wants to make profits it has to satisfy a demand. If you do not produce what people want, the market kills off your business. International aid is exactly the opposite. If the World Bank goes to help a country and the country does not grow and is worse off after the World Bank intervenes, what happens? The World Bank says that the country has 'moved away from the Millennium Development Goals'… and then asks for a bigger budget to solve the problem.

[68] In a recent paper, Helliwell (2004) also notes that 'very high Scandinavian measures of subjective well-being are not matched by equally low suicide rates'. Data from the World Health Organisation (http://www.who.int/topics/suicide/en/) shows that the male suicide rate in Finland was 32.3 per 100,000 in 2002. This compares with 80.7 for Lithuania, 69.3 for Russia, 60.3 for Belarus (2001), 52.1 for Ukraine (2000), 17.1 for the USA (2000), and 11.8 for the UK (1999). Limited data for China (1999) indicates that it is one of the very few countries where the female suicide rate exceeds that of males.

[69] The Foundation Umbele looks for 'experience, honesty, simplicity, transparency and efficiency' in order to return the future of Africa to its own citizens. See information on the activities of the foundation at www.umbele.org.

So how do we devise a responsive system of help to Africa that listens to what the people who live there actually want, and also penalises failure?

One way is to actually encourage firms, that have the technology, human capital and other resources, to go to Africa. Let these firms find out what the real problems are that the people want solving. What are the priorities in the face of budget constraints? Do the people want a new school, more doctors, or better roads? The World Bank doesn't know, the United Nations don't know, Bono doesn't know, and I don't know. Only the people in Africa themselves really know what the priorities should be. We need to find better ways of getting this information and meeting their needs.

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