Modern Economic Growth and Recent Stagnation

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> Every day in every way, it's getting better and better.
> —John Lennon (*Beautiful Boy*)

Life is dramatically better for the typical American born in 2000 than for someone born in 1850. A child born in 2000 can expect to live seventy-seven years on average. Survival to a first birthday is taken for granted: 99.4 percent of newborns reach age one. Education is likely to continue beyond high school, lasting more than thirteen years on average, and work life does not begin until age twenty. These statistics merely summarize patterns that are apparent from casual observation. They also provide a useful way to compare life today to life in 1850. A child born in 1850 could expect to live forty years, only slightly more than half the expected lifetime today. Only 85 percent of babies lived until their first birthday. Childhood was short, with a typical child staying in school only three years and starting work by age nine.

The transition from these conditions in 1850 to conditions today has been gradual and persistent. With little variation, this transition is consistent with changes in people's lives in much of Western Europe, Australia, Japan, and New Zealand. In an even shorter time span—less than one hundred years and in some cases fifty years—a similar transition has also occurred in Greece, Ireland, Portugal, Spain, South Korea, and Taiwan. In fact, every part of the world has seen some transformation of a typical newborn's life. In every region of the world, the probability of a baby's surviving to its first birthday has risen, life expectancy has risen, and a child spends more time in school than his ancestors did.

These improvements in general conditions of well-being are mirrored in more pedestrian measures of possessions. Although beginning work at age nine, an average American born in 1850 did not have much in the way of material possessions: He could expect to benefit from only about $5,000 dollars of output per worker (in 1985 dollars). The average output per worker in 1999 was over nine times as high: $46,000 (in 1985 dollars). These measures of living standards are abstract because they measure a person's command of goods and services in general. A less abstract measure of a person's command of goods and services is the number of hours a person must work to accumulate the income to buy specific goods and services.

People acquire many more goods today for far less time spent working than in the past. Although the data to make such comparisons are not available as far back as 1850, comparisons with 1919 are possible for some goods. In 1919, a worker in the United States worked nine and a half hours, on average, to purchase a dozen grocery items. By 1997, the typical worker worked only about one and a half hours to purchase the same groceries. Based on a forty-hour workweek, a year and a half of work was necessary to buy a refrigerator in 1919, and less than two weeks of work was necessary in 1997. In

1919, purchasing a Ford Model T, the first mass-produced "affordable" car, required almost one and a half years of work. By 1997, buying a Ford Taurus required working less than eight months.[1]

Measured by the goods people own, living standards are higher for people today. Eighty-five percent of households in the United States did not have flush toilets in 1900. Less than 1 percent of households did not have complete indoor plumbing in 2000. Four out of nine households owned a refrigerator in 1940; virtually every household had one by 1960. One out of seven households had air conditioning in 1960; almost three-fourths had air conditioning in 2000. Color television was in four out of

> **Rising real income throughout the world since the mid-1800s has been termed modern economic growth because increases in real income per worker that continue for decades were uncommon in earlier centuries.**

nine homes in 1970 and in virtually every home by 1990. Personal computers were in only one out of six homes in 1990 but in over half the homes in the United States ten years later.[2] Other goods tell the same story: People have far more goods today than they had even in the recent past.

As with the trends in infant survival, life expectancy, and education, this story of rising living standards in the United States is repeated in other parts of the world. Over the last fifty years or more, every region in the world has seen a transformation of its living standards.[3] Some regions have experienced a longer period of sustained growth, and others have more recently entered into an era of growth.

This improvement in living standards is not, however, invariable. Some parts of the world have experienced declining living standards in the 1980s and 1990s. Although these are bad times for the millions of people in these areas, these people still are better off than their ancestors forty or more years removed. And the bad times will not necessarily continue.

This article has two themes: (1) Economic growth has improved the lives of all people compared to those of their ancestors. (2) Economic decline over the past few decades applies to only a few regions and is unusual in the history of the world since 1800.

Overall Improvements in Living Standards

When I change my living standard and I move uptown . . .
—Janis Joplin (*Bye, Bye Baby*)

Long-term comparisons show the substantial improvements in living standards that have occurred everywhere.

Measures of living standards. *Living standard,* defined by the *Oxford Concise Dictionary* as "the degree of material comfort available to a person or class or community," may seem too vague a concept for making comparisons between the United States and Great Britain, let alone the United States and, say, Uruguay. Even so, there are ways of estimating people's living standard and changes in it. Three of these measures are life expectancy, infant survival rates, and income per worker. While not the only ways to compare living standards, these measures do represent people's ability to sustain life and buy goods and services.

Life expectancy at birth is an estimate of the number of years that a newborn will live given current mortality rates.[4] Life expectancies vary substantially around the world. For example, in 1999, Japan had the longest life expectancy, eighty years, and Sierra Leone had the shortest, thirty-eight years.

The infant survival rate is the number of infants who survive to one year of age per one thousand births.[5] Because infants are particularly susceptible to catastrophic events in their environment, such as famines, a higher survival rate indicates better care and a more supportive environment for children and implies less grief for parents. Like life expectancy, infant survival rates vary substantially across countries and have improved over time. In 1999, the highest infant survival rate was 99.6 percent in Finland, Norway, Sweden, Switzerland, and Singapore, and the lowest survival rate was 83.1 percent in Sierra Leone. These rates are noticeably higher than earlier ones. An infant survival rate of 67.7 percent in Mexico in 1910 is the lowest rate in the data underlying this article.

Real income per person is a measure of the average person's living standard because people with higher incomes can buy more, at least if prices do not change. Because inflation—an increase in overall prices—does happen frequently, the appropriate measure of income is real income: income adjusted for overall changes in the level of prices. *Real income per person* is a measure of how much a typical person can buy given the average income in the economy. If real income per person rises over time in a country, then the typi-

cal person in that country can buy more goods and services.

Real income per worker, used in this article, is closely related to real income per person and generally changes in the same direction. The number of workers is more directly related to the quantity of goods and services produced in an economy than is population. This article uses the terms real income per worker and output per worker interchangeably because *real income* and *output* are the same thing in standard National Income Accounting.

Changes in real income per worker, although more abstract than changes in life expectancy and infant survival rate, are an excellent summary measure of growth in people's well-being. For example, real income per worker grew by 2 percent per year in the Western Countries (see the appendix) from 1950 to 1999 and by 1.6 percent per year in Latin America. Real income per worker in 1999 (in 1985 dollars) was $40,398 in the Western Countries and $11,061 in Latin America.[6] These figures indicate that living standards have been increasing and that in 1999 they were higher in the Western Countries than in Latin America.

The data on real income used in this article were not previously available in computer-readable form

suitable for analysis (Baier, Dwyer, and Tamura 2002). These data on 145 countries cover 98 percent of the world in 1999, extend back before 1900 for twenty-four countries, and include education and experience for the workforce in all of the countries.

The countries are grouped into nine regions because it is easier to see developments for a few regions than for 145 individual countries. The regions are the Western Countries (which includes most of Northern Europe, Australia, New Zealand, Canada, and the United States), Southern Europe, Central and Eastern Europe, the Newly Industrialized Countries (NICs), Asia, the Middle East, Northern Africa, Sub-Saharan Africa, and Latin America.[7] Because there are large differences in the sizes of the countries, equally weighting every country in a region would misrepresent the experience of the typical person in a region. To avoid this problem, this analysis presents weighted averages for each country in a region, with the weight being the country's share of the region's labor force in 1999.[8]

Life expectancy at birth. Figure 1 shows that life expectancy at birth was higher in 1999 than in the past in each of the nine regions. Since the early 1800s, life expectancy in the Western Countries has increased from less than forty years to seventy-seven

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1. See Table A1 in the appendix for more information on the falling real cost of consumption items. The lone exception in the table is tuition at the University of Texas—payment for a service. Although higher education has become more expensive since the middle 1970s, higher earnings for college-educated workers compared to high school graduates more than compensates for the higher tuition.

2. More details on the rise in living standards in the United States are contained in Table A2 in the appendix.

3. Tables A3 and A4 in the appendix provide information for twelve European countries and the United States on household ownership of a variety of durable goods: clothes washers, clothes dryers, dishwashers, refrigerators, color televisions, video cassette recorders, personal computers, and automobiles.

   For most of the items and most of the years, the United States leads this group in material ownership, but there is convergence in many if not all of the goods. Even the poorest countries in the group—Poland, Romania, and Russia—have experienced substantial increases in the ownership of these consumer durables. Table A5 in the appendix shows that ownership of these items has increased in other countries as well.

4. The life-expectancy data in this article are from various issues of the *World Development Report*, produced annually by the World Bank; Keyfitz and Fleiger (1968, 1990); Keyfitz, Preston, and Schoen (1972); and the U.S. Department of Commerce (1975).

5. The infant survival rate can have a large effect on life expectancy because in some countries this survival rate is roughly 80 percent, dramatically lowering average life expectancy. Nonetheless, this correlation is less important in recent years. The data on infant survival are from the same sources as life expectancy data.

6. These dollars are adjusted for purchasing-power parity (PPP). One obvious way to measure real income per worker is to convert income per worker in local currency to dollars based on current market exchange rates and then convert the income in current dollars to real income. The presence of nontraded goods and services, however, implies that market exchange rates do not reflect the value of all goods and services across countries. For example, the prices of nontraded services such as haircuts and taxi rides in higher-income countries typically are higher than in lower-income countries. A more accurate method is to convert income into dollars using PPP exchange rates, which value goods and services at U.S. dollar prices rather than at exchange-rate-adjusted local currency prices.

7. The appendix lists the countries in the regions. Baier, Dwyer, and Tamura (2002, appendix) summarize information on the individual countries.

8. The figures can show estimates of either the level or the growth rate of the variables, but not both. The figures for output, aggregate input, and total factor productivity (TFP) show growth rates. (Baier, Dwyer, and Tamura 2002 provide details on how these figures were calculated.) The levels themselves are of substantial interest for life expectancy and infant mortality, so weighted averages of the levels are used at the risk of some distortion over time.

FIGURE 1

Life Expectancy at Birth
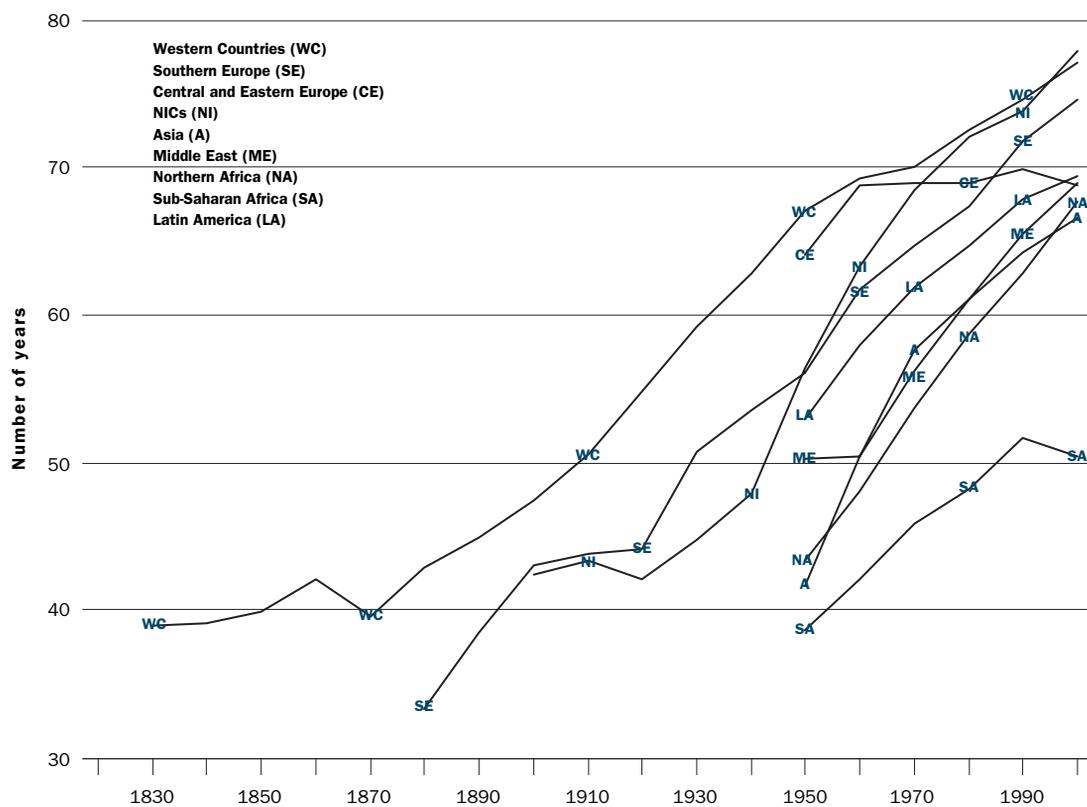
Western Countries (WC)
Southern Europe (SE)
Central and Eastern Europe (CE)
NICs (NI)
Asia (A)
Middle East (ME)
Northern Africa (NA)
Sub-Saharan Africa (SA)
Latin America (LA)

Sources: World Bank, World Development Report (various years); Keyfitz and Fleiger (1968, 1990); Keyfitz, Preston, and Schoen (1972); and the U.S. Department of Commerce (1975).

years in 1999. Life expectancy in every other region of the world has increased as well, generally more rapidly than in the Western Countries. This higher life expectancy is a result of better nutrition, improved health care, and improved sanitation.

Despite these impressive increases in life expectancy, two regions experienced stagnant or falling life expectancy in recent decades. Central and Eastern Europe had a stagnant life expectancy of about seventy years from 1960 to 1990 and falling life expectancy from 1990 to 1999. The decrease in life expectancy in Sub-Saharan Africa from fifty-two years in 1990 to fifty years in 1999 is striking and is at least partly related to deaths from AIDS.

Infant survival rates. Infant survival rates also have improved for every region over the entire period covered by the data. Figure 2 shows the regional infant survival rates per thousand live births by region. In the region with the lowest survival rate, Sub-Saharan Africa, 91 percent of babies born in 1999 survived to their first birthday compared to only 82 percent in 1950. In comparison, in the

Western Countries 99.4 percent of babies born in 1999 survived to their first birthday, and 96.6 percent born in 1950 survived for a year.

In recent years, infant survival rates have increased more uniformly than has life expectancy. No regions have falling infant survival rates in recent decades even though life expectancy has been flat for fifty years in Central and Eastern Europe and declined from 1990 to 1999 in Sub-Saharan Africa.

Income per worker. For every region of the world, real income per worker was higher in 1999 than in the first year for which we have data for that region. Figure 3 shows real income per worker for the nine regions. The figure's vertical scale is proportional, which means that the slopes of the lines from one date to another are growth rates of real income. The rising real income throughout the world during this period has been termed *modern economic growth* because increases in real income per worker that continue for decades were uncommon in earlier centuries.

Economic growth is not inevitable, though, even in the modern period. For instance, real income per

FIGURE 2

Infant Survival Rate
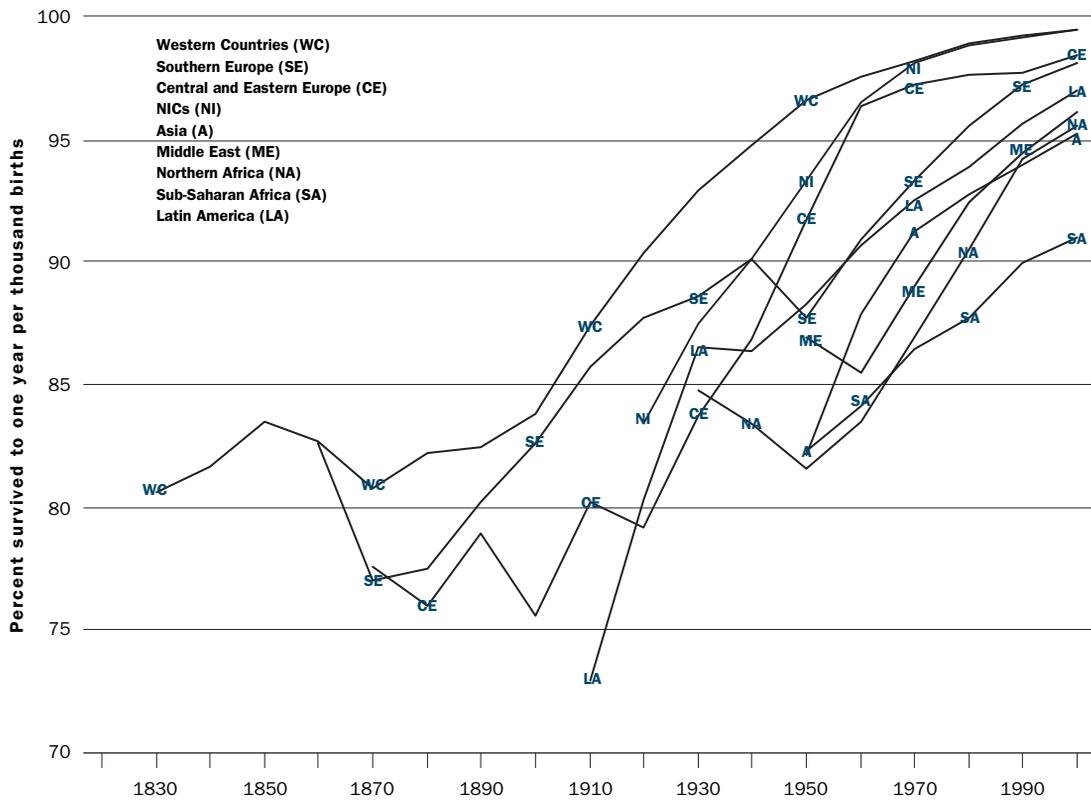
Western Countries (WC)
Southern Europe (SE)
Central and Eastern Europe (CE)
NICs (NI)
Asia (A)
Middle East (ME)
Northern Africa (NA)
Sub-Saharan Africa (SA)
Latin America (LA)

Sources: World Bank, World Development Report (various years); Keyfitz and Fleiger (1968, 1990); Keyfitz, Preston, and Schoen (1972); and the U.S. Department of Commerce (1975).

worker in the Western Countries was lower in 1920 than in 1910. More recently, real income per worker in the Middle East was lower in 1999 than in 1980. Latin America's real income per worker declined from 1980 to 1990 and then rebounded somewhat from 1990 to 1999. In Sub-Saharan Africa, real income per worker dropped 13 percent from 1980 to 1999. Perhaps not surprisingly given the turmoil associated with the downfall of Communism, measured real income per worker in Central and Eastern Europe fell from 1990 to 1999.

Clearly, most people in the world today are better off than people living fifty or one hundred years ago. Figure 3 shows that although real income in some regions has fallen during the last twenty to thirty years, these decreases are atypical. These decreases in real income are correlated with, and possibly caused, shorter life expectancies.

It is relatively straightforward to gain some understanding of why these decreases in real income have occurred. Real income per worker can decrease for only two reasons: (1) declines in the physical and human capital per worker available to produce output or (2) declines in productivity per worker. Are the decreases in real income per worker observed in these data associated with declines in physical and human capital, in productivity, or in both? The answer to this question, while not complete, provides clues to the underlying reasons.

Aggregate Inputs and Productivity

You don't get something for nothing.
—Neil Peart (*Something for Nothing,*
performed by Rush, music by Geddy Lee)

What explains these changes in living standards? A useful start is to examine changes in the resources available for production as well as productivity. The services of physical capital and of the labor force—including the effects of its education, training, and experience—can be summarized as *aggregate input*. By definition, the growth in output per worker that is not explicable by growth in aggregate input is attributable to growth in *total factor productivity*

FIGURE 3

Real Income per Worker
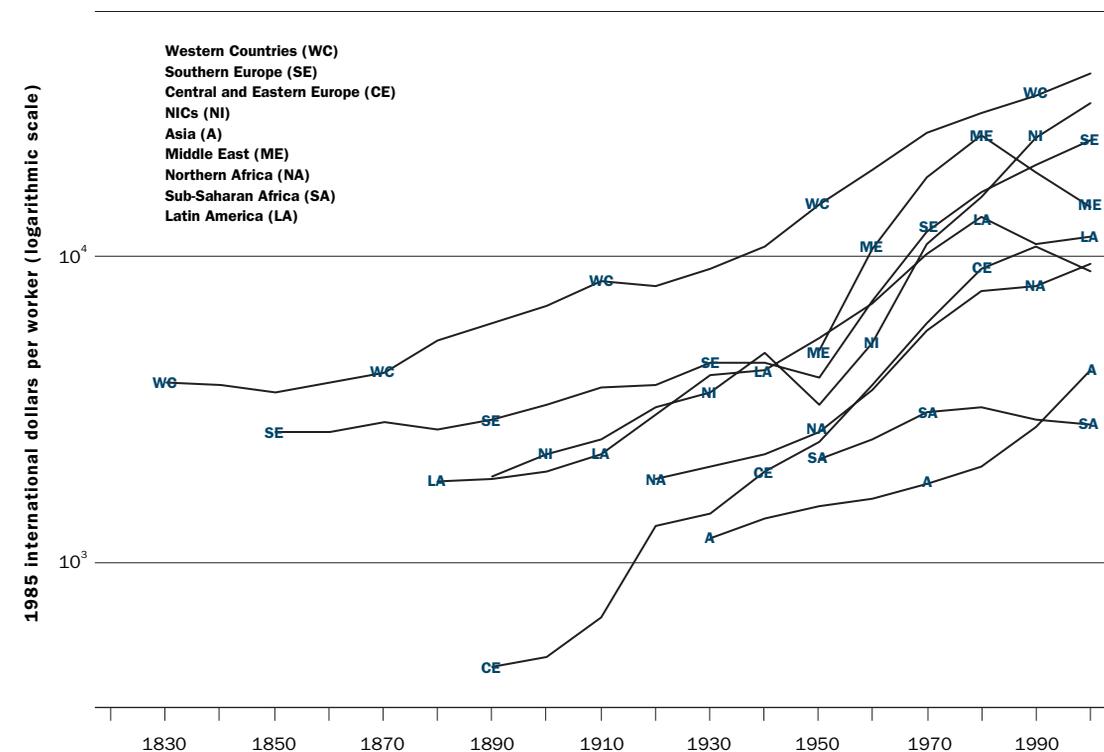
Source: Baier, Dwyer, and Tamura (2002)

(TFP).[9] How much of the growth in output per worker is associated with growth in aggregate input, and how much is associated with growth in productivity?

Aggregate input in the regions. Aggregate input has been an important contributor to the growth of output per worker. Figure 4 shows that measured aggregate input almost uniformly increases for every region. The only exception to this pattern is a decade of virtually no change in aggregate input from 1840 to 1850 for the Western Countries. Increases in education, experience, and physical capital are an important part of the explanation of the growth of real income per worker, and TFP is not the major source of the growth of income per worker over longer time periods.[10]

Even so, fluctuations in physical and human capital cannot explain the evident decreases in real income per worker in Latin America and other regions in Figure 3. These decreases must be due to declines in TFP.

Productivity in the regions. Figure 5 shows the growth of TFP for the regions. Growth of TFP is the growth of output per worker that is not due to growth of aggregate input. Aggregate input growth reflects the growth of physical and human capital,

and TFP growth reflects everything else. "Everything else" includes a great many events. Events that have positive effects on TFP growth include improvements in the stock of physical capital that are not associated with higher market prices, for example, improvements in personal computers in the last twenty years; gains in knowledge that are not associated with more schooling, for example, improved knowledge of building semiconductors; and changes in government regulations that enhance the operations of markets, for example, clearer enforcement of property rights. Events that have negative effects on TFP growth include investment in capital stock that has no useful purpose, for example, building a road in the middle of nowhere; decreases in the amount learned per year of time in school, for example, time spent in school with no pencils, paper, or other resources (Easterly 2001, 288–89); and changes in government regulations that impede the operations of markets, for example, government grants of monopoly rights to some individuals.

TFP per worker in Figure 5 does not grow as rapidly as real income per worker or aggregate input per worker. The slower growth of TFP per worker than real income per worker reflects the

FIGURE 4

Aggregate Input

Western Countries (WC)
Southern Europe (SE)
Central and Eastern Europe (CE)
NICs (NI)
Asia (A)
Middle East (ME)
Northern Africa (NA)
Sub-Saharan Africa (SA)
Latin America (LA)

Aggregate income per worker (proportional scale)
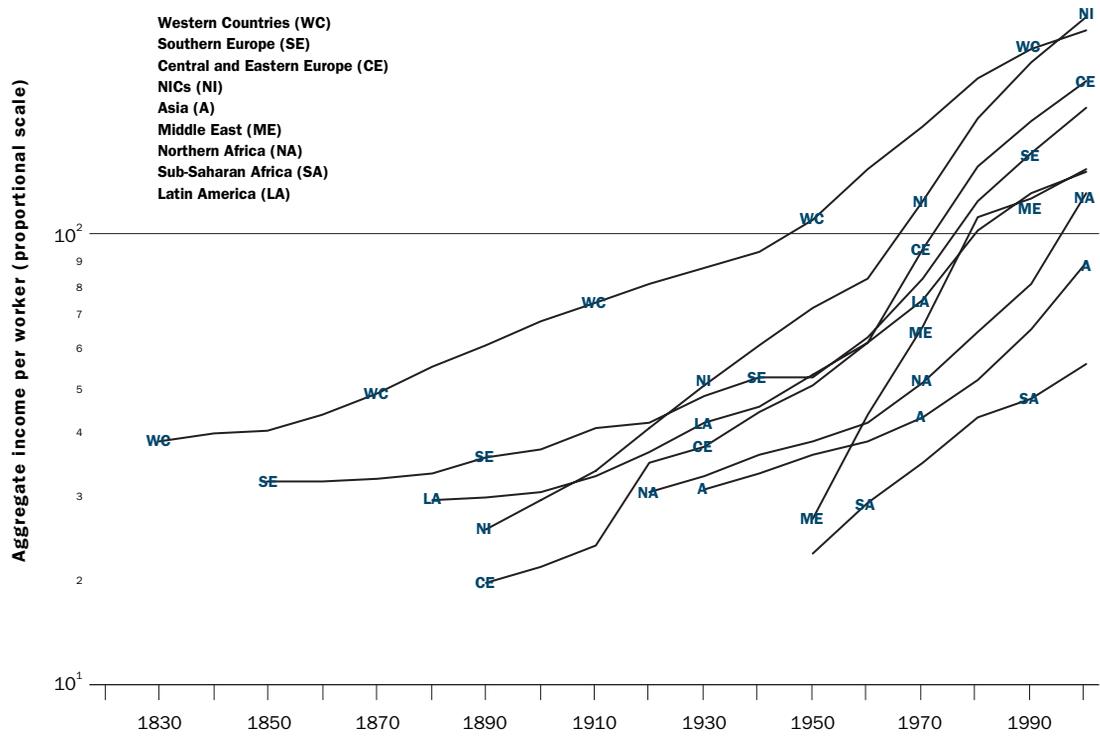
Source: Baier, Dwyer, and Tamura (2002)

growth of aggregate input per worker.[11] The slower growth of TFP per worker than aggregate input per worker reflects the large contribution of aggregate input growth to the growth of output per worker (Baier, Dwyer, and Tamura 2002).

Figure 5 also shows that the growth of TFP per worker is bumpier than the growth of real income per worker in Figure 3. TFP shows an overall upward trend in the Western Countries in the 1900s. On the other hand, Latin America, North Africa, Central and Eastern Europe, Sub-Saharan Africa, Southern Europe, and the Middle East all recorded decreases in TFP in recent decades. In fact, some of these decreases are precipitous.

9. In this analysis, it is assumed that the relationship between output and resources can be summarized by an aggregate production function, which can be written

(1) $Y(t) = A(t)F[K(t), H(t)],$

where $Y(t)$, $K(t)$, and $H(t)$ are output, physical capital, and human capital, respectively, at time t and the parameter $A(t)$ represents the level of TFP at time t. Writing the production function this way restricts changes in the production function to Hicks-neutral changes in TFP. If social marginal products equal private ones and there is perfect competition, equation (1) implies that

(2) $a = y - \alpha k - (1 - \alpha)h,$

where α is capital's share of income and a lowercase letter denotes the growth rate of a variable per worker. The growth rate of aggregate input is defined by $i = \alpha k + (1 - \alpha)h$. While the factor shares, α and $1 - \alpha$, generally vary over time, we assume that such variation is relatively unimportant. The growth rate of TFP per worker, a, in equation (2) is a residual computed from the other variables, which are observable. Equation (2) is used to estimate the growth rate of TFP per worker as well as the variation in its growth over time and across countries.

10. Baier, Dwyer, and Tamura (2002) provide more analysis and support for this assertion.

11. The growth rate of output per worker equals the growth rate of aggregate input per worker plus the growth rate of TFP per worker.

FIGURE 5

Total Factor Productivity

Western Countries (WC)
Southern Europe (SE)
Central and Eastern Europe (CE)
NICs (NI)
Asia (A)
Northern Africa (NA)
Sub-Saharan Africa (SA)
Latin America (LA)
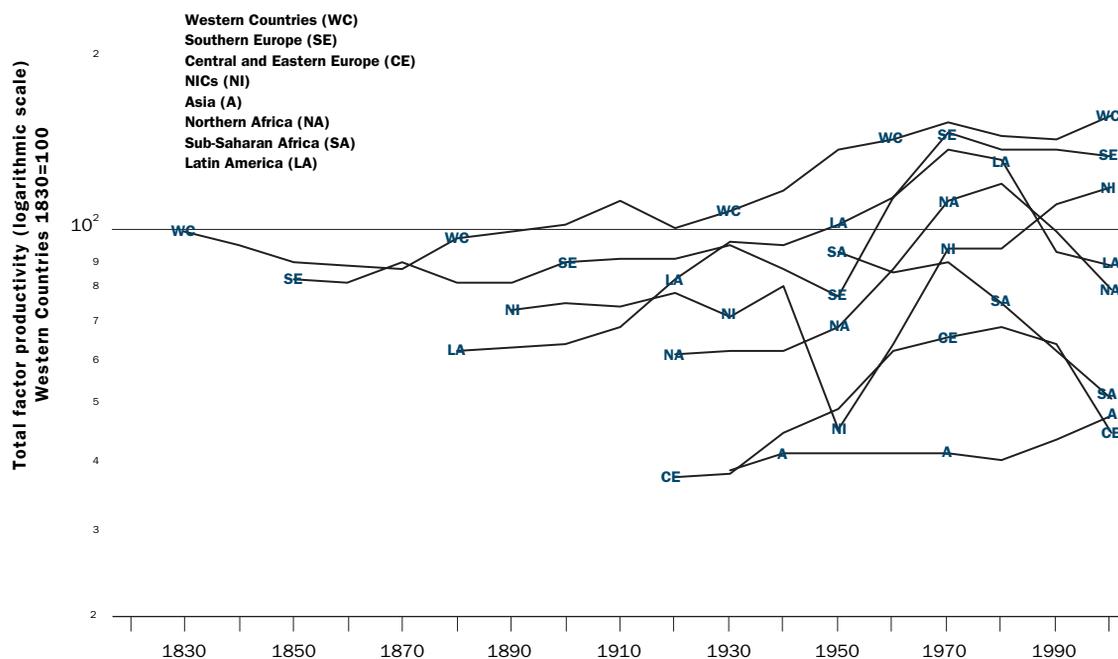
Note: The TFP values for the Middle East are 1950, 183.73; 1960, 243.05; 1970, 279.72; 1980, 234.17; 1990, 160.82; 199, 107.45. These values exceed the range of this graph and therefore are not shown.
Source: Baier, Dwyer, and Tamura (2002)

These declines in TFP are often, but not always, associated with decreases in income. The decrease in TFP in Latin America at a 2.2 percent rate from 1980 to 1999 is associated with real income falling at a 0.8 percent rate; TFP continued to fall from 1990 to 1999 at a 0.5 percent rate, but income per worker increased at the relatively slow rate of 0.6 percent per year.

The decrease in TFP in North Africa since 1980 reflects precipitous drops in TFP in three countries: Egypt, Libya, and Morocco. The ratios of TFP in 1999 to TFP in 1980 are 56.3 percent for Egypt, 48.2 percent for Libya, and 61.3 percent for Morocco. These decreases in TFP make it all the more remarkable that income per worker in the region rose over the same period.

Central and Eastern Europe includes Russia, countries that were part of the Soviet Union, and countries that were Soviet satellites, such as Poland. Since the demise of the Soviet Union, TFP growth has fallen quite dramatically in this region. The decrease in TFP in the region since 1990 has been concentrated in Russia and the Ukraine, which together make up about 50 percent of the region's labor force.

Sub-Saharan Africa experienced a precipitous drop in TFP of 1.9 percent per year from 1970 to

1999, resulting in a TFP per worker about 42 percent lower in 1999 than in 1970.

Recent Reversals in Income and Total Factor Productivity

Looks like we're in for nasty weather.
—John Fogerty (*Bad Moon Rising*,
performed by Creedence Clearwater Revival)

What explains these reversals of the patterns of modern economic growth? Falling real income per worker and even more rapidly falling TFP characterize the recent history of Latin America, Central and Eastern Europe, Sub-Saharan Africa, and the Middle East. Are these decreases in real income per worker and TFP a harbinger of the future, or are they a temporary setback in the course of modern economic growth? It is impossible to provide a definitive answer to this question. Nonetheless, we can combine our data with the available literature to draw informed inferences about the reasons for the recent reversals.

Latin America. From 1900 to 1980, the growth rate of output per worker in Latin America was roughly the same as the growth rate of output per worker in the Western Countries. From 1980 to 1990,

however, output per worker for the average person in the Latin American countries fell. What led to this "lost decade" of the 1980s for Latin America, and will this pattern continue?

A set of economic policies called import substitution is often cited as the main cause of Latin America's problems in the 1980s. These policies had large negative effects on economic growth in the 1980s in response to developments in the 1970s and 1980s.[12]

Import substitution encourages consumption of domestically manufactured goods over imported goods by placing high tariffs or small quotas on imported goods that compete with domestic industries. Entry into these industries is encouraged, which results in an inefficient allocation of resources and resulted in overcapacity in many industries in Latin America. The lack of competition provides little incentive for the industries to produce goods efficiently, and import substitution policies can result in large government bureaucracies to pick the winners and provide credit. In Latin America, the expenditures to provide credit worsened very large government deficits at the same time that low real interest rates designed to encourage investment also discouraged domestic saving. Instead of providing funds to local industries or the government, people either consumed more or invested their funds abroad at higher interest rates.

From 1950 to 1980, import substitution policies had little success in transforming Latin American countries into exporters of manufactured goods. The problems caused by these policies did not have a noticeable effect on growth, however, until external shocks occurred in the 1970s and 1980s. In the 1970s, oil prices increased dramatically, and the current accounts for the oil-importing countries in Latin America went into deficit. Funds to finance these current-account deficits were available in the 1970s from the oil-exporting countries. Most of the developed world was in a period of slow economic growth, and more credit was extended to many of the governments in Latin America.[13] These loans were dollar denominated at initially low but variable interest rates, but these low rates did not continue forever.

Higher interest rates in the United States and other countries at the end of the 1970s raised the interest rates on Latin American debt, thereby making it more difficult for Latin American countries to service their debt. By 1982, fears of default slowed or reversed foreign purchases of Latin American debt, and Latin American countries monetized government deficits that could no longer be financed abroad. This monetization led to collapses of exchange rates and higher inflation in many countries.

Conditions worsened in the 1980s. As concerns about default increased, average annual inflation rose dramatically from 1980 to 1985. The economic distortions associated with increases in inflation are severe (Lucas 2000). Real wages fell, leading to more social unrest. These factors all contributed to

> Once modern economic growth—consistent increases in output, input, and productivity per worker—begins, it tends to continue on a regular basis and improve people's lives.

the fall in output and the designation of the 1980s in Latin America as "the lost decade."

In sum, import substitution policies are not the sole reason for the lost decade, but they are a major contributing factor. The higher price of crude oil created a bad situation for these countries. The import substitution polices deserve the blame, though, for making a bad situation worse.

Since 1990, several attempts have been made to mitigate the problems associated with Latin America's large external debt. Some of the reforms in the 1990s had no impact or were undone soon after they were introduced. For example, the Argentinean government recently defaulted on its domestically held debt. Whether all of Latin America will return to more continuous economic growth remains to be seen.

Central and Eastern Europe. The region called Central and Eastern Europe includes the countries that have developed from the collapse of the Soviet Empire, some of which always were independent countries to some extent, such as Hungary,

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12. Sachs and Larrain (1993) and Cardoso and Dornbusch (1989) argue that import substitution policies, along with external shocks, were the causes of the debt crisis in Latin America. Taking a different view, Rodrik (1998) argues that there is no direct link between import substitution policies and the poor Latin American performance in the 1980s. Bauer (1972) argues that import substitution is bound to lead to the problems confronted by Latin America.

13. Dooley (1995) discusses why the commercial banks in developed countries were more willing to loan funds to developing countries.

and some of which were part of the Soviet Union, such as the Ukraine. The common feature of these countries is that each had a command economy while it was part of the Soviet Empire.

In one sense, the experiences of these countries since the Soviet Union's collapse from 1989 to 1991 have been surprising.[14] Initially, output fell for all the countries, and many had lower measured output per worker in 1999 than in 1990.[15] This pattern raises the question: If a command economy is worse at organizing production than a market economy, why would output fall?[16]

Comparing output in a command economy and a market economy is tricky because output in market

> It is easy to overemphasize decreases in income and productivity in various parts of the world in the last ten or twenty years and treat them as if they were typical.

economies is measured at market prices. These market prices reflect the amounts that buyers want to buy and that producers want to produce and sell, and these prices determine which people receive the goods and services. The prices of goods and services in a command economy have little or no relationship to the value people place on them or to the quantities of the goods or services people receive. As a result, without substantial adjustments to the data, which our data lack, the data must be taken with a grain of salt. Even so, it is unlikely that the 30 percent decrease in output per worker in Russia is a statistical artifact.

After the fact, the initial decreases in output are not too hard to explain. At first, the transition from command economies to market economies was extraordinarily disruptive. Even if all the institutions for supporting a market economy were recognized and in place instantaneously, many purchases and sales that occurred regularly in the command economy no longer would occur. For example, the demise of the Soviet Union was followed by the collapse of the system for international trade among those countries. As a result, regular buyers for some goods and services found it no longer worthwhile to buy the same goods as before, and it took time for producers to adjust. Output fell during this transition.

That said, the presence or absence of institutions that support a market economy is an important part of the explanation of the behavior of output since the collapse of the Soviet Union.[17] The institutions in place in various countries at the beginning of the transition differed substantially across countries. For example, during the entire period after World War II, farmers in Poland owned the land they farmed. Farmers in most other planned economies worked on collective farms nominally owned by the farmers, but they had no property rights in the sense of rights to use the land as they wished or to transfer the land. As a result of these different property rights, Poland's farmers experienced a much less disruptive transition to a market economy than did farmers in Russia and most other Soviet satellites.

Central and Eastern European countries have also differed in the rate at which they have adopted institutions to support a market economy. Some countries, such as the Czech Republic and Latvia, are seeking to join the European Union in the next few years. At the same time, some countries such as Belarus and Turkmenistan still have command economies in place.

The most plausible explanation for the different rates at which countries have adapted to market economies is a simple one referred to by the evocative phrase "market memory."[18] Countries that were independent before the fall of the Soviet Union grew faster after the collapse (Havrylyshyn and van Rooden 2000). Some of these countries, such as Poland and Yugoslavia, had market economies before they had planned economies, and many of the institutional changes necessary to support a market economy were merely returns to previous institutions. In other countries such as Russia, with no history of a market economy, there were no prior institutions to return to.[19] Whereas Poland was partly reinstating Polish institutions after throwing off foreign control, Russia had to invent institutions new to that country.[20]

The transition to market economies has been rocky in Central and Eastern Europe, but many countries are completing that transition. The evidence suggests that countries that have not already started on a path of sustained growth, such as the Czech Republic and Poland, will experience modern economic growth similar to the Western Countries in the near future.

Sub-Saharan Africa. Real income per worker in Sub-Saharan Africa has been falling since 1980. A growth rate of –0.7 percent per year does not seem like much of a fall, but it adds up over twenty years. Output per worker in Sub-Saharan Africa in 1999 was 87 percent of its level in 1980. This decline in real income is not due to a decrease in physical and human capital used in production; it is associated with a dra-

matic decrease in TFP. In 1999, TFP was 68 percent of its level in 1980. In all of the regions, such a drop in living standards and productivity is unprecedented.

Researchers have arrived at a general consensus about Africa's decline in living standard. Africa has low rates of investment associated with low returns on investment and poor fiscal policy, high barriers to trade, and relatively little protection of private property rights.

Rodrik (1999) shows that Sub-Saharan Africa has higher tariff rates on all products from 1980 to 1990 relative to two other low-income regions—the Caribbean and East Asia—and has reduced these rates less than all other regions. These tariffs are exacerbated by larger government distortions in the foreign exchange market (Easterly and Levine 1997).

Government corruption also is higher in Sub-Saharan African countries compared with similar countries (Collier and Gunning 1999). In addition, ethnic heterogeneity, which can be associated with civil wars and strife, is greater in Sub-Saharan African countries than in any other region. Tamura (2002) shows that Sub-Saharan Africa would have a 50 percent increase in living standards immediately and possibly a six- to tenfold increase in living standards within twenty to thirty years if it eliminated poor government policies in regulation, fiscal policy, and trade policy.

Can government intervention help these countries grow, perhaps through international agencies? It is clear that government policies can throttle growth. It is less clear whether government policies can promote growth. It is hard not to notice that the period with the most abysmal growth in lower-income countries such as the Sub-Saharan countries is the period in which the most international aid was given. That fact does not imply that the aid was worse than useless: World events may have simply thrown up more difficulties than in earlier periods. On the other hand, individual projects examined by Bauer (1972) and Easterly (2001) suggest that some of the international aid, which generally is provided as low-interest loans to be repaid by the country's citizens, has been misguided at best.

Population growth is often thought to be a major problem in Sub-Saharan Africa. People in the region do have a higher fertility rate and fewer years of schooling than people in other parts of the world. Tragically, Sub-Saharan Africa is more likely to have a population implosion than a demographic transition or overpopulation. Sub-Saharan Africa has much higher AIDS and HIV infection rates than any other region in the world. Deaths from AIDS and HIV infection account for the declining life expectancy at birth in the region between 1990 and 1999. The table on page 24 shows the change in life expectancy between 1990 and 1999 and HIV infection rates by regions. A simple statistical estimate suggests that the greater incidence of AIDS explains 80 to 90 percent of the decrease in life expectancy at birth in Sub-Saharan Africa from 1990 to 1999. Unless the incidence of AIDS and HIV falls, life expectancy in Sub-Saharan Africa will continue to drop.

The Middle East. Real income per worker in the Middle East was lower in 1999 than in 1980. This decrease reflects decreases in real income per worker in two countries: Iran, which accounts for 41 percent of the region's labor force in the Middle East, and Iraq, which accounts for 13 percent of the labor force. These declines appear to be associated with political regimes. The drop in real income in Iran occurred after the Iranian Revolution, and the decrease in Iraq was associated with Saddam Hussein's regime. The implications for the future are not obvious. As of this writing, Saddam Hussein's regime has fallen, but the replacement government may be little different in terms of economic policies, a command economy in many respects, or it may be dramatically different—a market economy. The regime in Iran may continue to depress economic growth, or it may not. In some

14. The Berlin Wall was opened by the government of East Germany on November 9, 1989, and the Soviet Union was formally dissolved into sovereign republics on December 25, 1991 (Encyclopaedia Britannica 2003 Ultimate Reference Suite CD-ROM, 15th ed., s.v. "Berlin Wall," "Communism"). Harrison (2002) provides a useful framework for thinking about the collapse.

15. More recent data, not included in this data set, show increases for more of the countries.

16. The World Bank (2002) and Campos and Coricelli (2002) summarize some of the research intended to answer this question.

17. In one sense, the lack of foresight about the importance of institutions is surprising. The economic analysis of law and property rights has been an important, substantive part of economics for decades (Alchian 1965), and there is a well-known textbook (Barzel 1997). Furthermore, economic historians and others have been analyzing institutions along related lines in the New Institutional Economics (North 1990), and more general analyses of economic growth are beginning to recognize the importance of institutions (Easterly 2001). In another sense, the failure to recognize the importance of institutions is not surprising: It takes time for innovations to take hold in economies, so why should it not take time in disciplines such as economics?

18. The International Monetary Fund (2000, chap. 3) provides a solid analysis.

19. For most of Russia's history, the czar owned everyone and everything (Pipes 1999).

20. Poland's situation points to another of North's analyses, that of the importance of culture (North 1990).

TABLE

Life Expectancy and AIDS/HIV Infection Rates by Region

	Change in life expectancy, 1990–99 (years)	AIDS/HIV infection rates, 1999 (% of population)
Western Countries	2.32	0.39
Southern Europe	2.78	0.27
Central and Eastern Europe	–1.02	0.22
Newly Industrialized Countries	4.04	0.03
Asia	2.39	0.35
Middle East	3.36	0.02
Northern Africa	4.97	0.03
Sub-Saharan Africa	–1.35	8.38
Latin America	1.78	0.60

Note: The changes in life expectancies and the infection rates are averages using 1999 labor force data.
Sources: Life expectancy data from the World Bank's *World Development Report* (various years). HIV infection rate data from the World Bank's *World Development Report* (2001), with the following exceptions: Puerto Rico data from <hardtruth.qti.net/map/PR.htm>; Taiwan data from <www.utopia-asia.com/aidstai.htm>.

ways, the situation in these two countries is similar to that in Eastern Europe before the fall of the Soviet Union. The strains are evident; the implications and possible results of the strains are far from certain.

TFP in every Middle Eastern country began falling before the region's real income per worker declined. TFP dropped in every country in the region, not just a few of them. These decreases may be partly associated with drops in oil prices, but that cannot be the whole story. Israel, which produces no crude oil, experienced little change in TFP from 1970 to 1999. The decreases in the other Middle Eastern countries during that period have not been uniform, and the falls have been precipitous in some countries. The largest decrease in TFP during the 1970–99 period has been in Yemen, with TFP falling 84 percent, and the second largest decrease in Saudi Arabia, with TFP falling 81 percent. These trends are partly a result of falling crude oil prices, but economic policies and the armed conflicts and unrest in the region also have been important influences.

Conclusion

But I still haven't found what I'm looking for.
—U2

Once modern economic growth—consistent increases in output, input, and productivity per worker—begins, it tends to continue on a regular basis and improve people's lives. This is consistent with the world's experience in the nineteenth and twentieth centuries.

Why did some countries start growing at one time and other countries at different times? No one knows the answer to that question. Evidence on this question has not been discussed for a good reason: There is a great deal of conjecture but little empirical basis for firm conclusions about why countries begin to grow.

Even so, it is fair to say that economic growth had spread around the world by the 1950s, with the possible exception of Sub-Saharan Africa. We can also say that economic growth such as that enjoyed by people in the Western Countries is typical and has been for some time. Output, input, and productivity per worker generally have been increasing even if at different rates than in the Western Countries.

It is easy to overemphasize decreases in income and productivity in various regions in the last ten or twenty years and treat them as if they were typical. Fortunately, the decreases in Central and Eastern Europe are likely to be transitory. Whether the recent problems in the Middle East, primarily Iraq and Iran, and Latin America are transitory is still uncertain.

Sub-Saharan Africa is a different case, not just in terms of the low level of income itself but also in terms of growth. With the exception of South Africa, these countries show little evidence of increasing productivity per worker in the available data. It is not clear that modern economic growth ever began in Sub-Saharan Africa. Unfortunately for this region, these countries provide more evidence about how government policies can throttle economic growth than about how to encourage it, let alone jump-start it.

Looking at the Data by Region

The underlying data used in this article are by country, but, for convenience, data are summarized by world regions. The countries in each region are determined by judgment based on similarity of growth patterns and geographic coherence. The countries in each region are

Western Countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, Canada, the United States, Australia, and New Zealand

Southern Europe: Cyprus, Greece, Italy, Portugal, Spain, and Turkey

Central and Eastern Europe: Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Czechoslovakia, East Germany, Estonia, Georgia, Hungary, Kazakhstan, Kyrgystan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, the Slovak Republic, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and Yugoslavia

Newly Industrialized Countries: Hong Kong, Japan, (South) Korea, Singapore, and Taiwan

Asia: Bangladesh, Cambodia, China, Fiji, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, the Philippines, Sri Lanka, Thailand, and Vietnam

Middle East: Iran, Iraq, Israel, Jordan, Kuwait, Oman, Saudi Arabia, Syria, United Arab Emirates, and Yemen

Northern Africa: Algeria, Egypt, Libya, Morocco, and Tunisia

Sub-Saharan Africa: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, the Central African Republic, Chad, Congo, Ethiopia, Gabon, Gambia (The), Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Uganda, Zaire, Zambia, and Zimbabwe

Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Trinidad, Uruguay, and Venezuela

TABLE A1

Work Time (Hours) Needed to Purchase Consumer Items in the United States

	1919	1930	1950	1970	1997
Dozen grocery items	9.5	6.8	3.5	2	1.6
Man's suit	—	79	—	49	40
Range	345[a]	—	292	113	22
Clothes washer	553[b]	—	138[c]	72	26
Clothes dryer	—	553[d]	118	57	26
Refrigerator	3,162	—	—	112	68
Coast-to-coast flight	—	366	71	—	16
Color television	—	—	562[e]	174	23
VCR	—	—	—	365	15
Microwave oven	—	—	2,467[f]	176[g]	15
Ford automobile	4,696[h]	—	1,638	—	1,365
Square feet of new home	7.8	—	6.5[i]	—	5.6
University of Texas tuition	—	125	80	80	200
Pneumonia care[j]	579[k]	—	—	—	1.8

[a]For 1910. [b]For 1911. [c]For 1956. [d]For 1940. [e]For 1954. [f]For 1947. [g]For 1967. [h]For 1908. [i]For 1955. [j]From *Forbes*, September 1992. [k]For funeral.
Note: The cost of items is measured as the number of hours that a typical person had to work to purchase the items.
Source: Federal Reserve Bank of Dallas (1997).

TABLE A2

Rising Material Living Standards in the United States

	1900	1940	1950	1960	1970	1980	1990	2000
Homes	—	44	55	62	63	64	66	67
Homes without complete plumbing	85	72	60	30	15	5	<1	<1
Clothes washer	5	—	—	41	60	75	76	78
Clothes dryer	—	—	—	17	42	62	69	71
Air conditioning	—	—	—	15	37	55	68	72
Dishwasher	—	—	—	7	26	35	45	54
Microwave oven	—	—	—	—	—	10	79	83
Range	—	—	—	37	56	70	99	99
Refrigerator	18	44	80	98	100	100	100	100
Color television	—	—	—	—	42	90	99	99
VCR	—	—	—	—	—	1.1	88	97
Personal computer	—	—	—	—	—	—	16	64
Automobile	—	—	59	77	82	83	84	93

Note: The table shows the percentage of households owning an item.
Sources: U.S. Department of Commerce, *Statistical Abstract of the United States* (various years), with the following exceptions: plumbing, clothes washers, and refrigerators for 1900, Lebergott (1984); color televisions and VCRs for 2000, *New York Times Almanac* (2003); automobiles for 1950–70, U.S. Department of Commerce, *Historical Statistics of the United States: Colonial Times to 1970* (1975).

TABLE A3

Share of Households Owning Major Appliances

	1970	1980	1990	2000
Clothes washer				
Belgium	57	71	88	89
Denmark	42	56	76	78
France	68	79	88	98
Germany	79	89	88	98
Greece		30	74	85
Italy	51	94	96	98
Netherlands	85	85	91	96
Poland	—	14	40	51
Romania	—	—	—	5
Russia	—	—	—	11
Spain	58	79	87	82
United Kingdom	73	77	78	94
United States	60	75	76	77
Clothes dryer				
Belgium	—	—	19	27
Denmark	—	—	22	43
France	—	—	12	26
Germany	—	8	17	39
Greece	—	—	—	7
Italy	—	—	10	17
Netherlands	—	—	23	58
Poland	—	—	—	3
Romania	—	—	—	0.4
Russia	—	—	—	1
Spain	—	—	—	6
United Kingdom	—	38	42	54
United States	42	62	69	71

Share of Households Owning Major Appliances

	1970	1980	1990	2000
Dishwasher				
Belgium	7	12	26	44
Denmark	4	20	26	47
France	4	17	33	36
Germany	5	22	34	58
Greece	—	—	11	21
Italy	3	18	18	33
Netherlands	3	12	12	40
Poland	—	—	—	2
Romania	—	—	—	1
Russia	—	—	—	3
Spain	2	10	11	23
United Kingdom	2	4	11	26
United States	26	35	45	50
Refrigerator				
Belgium	56	91	—	100
Denmark	76	96	—	97
France	74	94	—	85
Germany	80	95	—	87
Greece	32	67	—	88
Italy	64	92	—	85
Netherlands	66	96	—	99
Poland	—	79	—	99
Romania	—	25	—	74
Russia	—	65	—	86
Spain	50	83	—	87
United Kingdom	60	93	—	99
United States	100	100	100	100

Source: Euromonitor (various years)

TABLE A4

Share of Households Owning Home Electronics and Automobiles

	1970	1980	1990	2000
Color television				
Belgium	4	51	—	99
Denmark	—	65	—	92
France	3	48	—	96
Germany	11	66	—	97
Greece	—	3	—	91
Italy	—	30	—	95
Netherlands	12	64	—	98
Poland	—	—	—	82
Romania	—	—	—	50
Russia	—	—	—	80
Spain	—	31	—	98
United Kingdom	4	69	—	98
United States	42	90	99	99

TABLE A4 (continued)

Share of Households Owning Home Electronics and Automobiles

	1970	1980	1990	2000
VCR				
Belgium	—	3	42	74
Denmark	—	3	39	84
France	—	1	35	61
Germany	—	3	42	66
Greece	—	—	37	44
Italy	—	0.4	25	68
Netherlands	—	3	48	78
Poland	—	—	—	75
Romania	—	—	—	5
Russia	—	—	—	13
Spain	—	0.2	40	66
United Kingdom	—	2	58	87
United States	—	1.1	88	97
Personal computer				
Belgium	—	—	11	46
Denmark	—	—	14	66
France	—	—	14	35
Germany	—	—	16	48
Greece	—	—	6	13
Italy	—	—	12	22
Netherlands	—	—	20	65
Poland	—	—	—	17
Romania	—	—	—	3
Russia	—	—	—	7
Spain	—	—	8	20
United Kingdom	—	—	14	41
United States	—	—	16	56
Automobile				
Belgium	48	50	—	78
Denmark	63	61	—	71
France	59	68	—	79
Germany	53	66	—	89
Greece	11	19	—	56
Italy	44	72	—	76
Netherlands	49	69	—	70
Poland	—	17	—	54
Romania	—	3	—	17
Russia	—	10	—	40
Spain	34	37	—	73
United Kingdom	61	56	—	73
United States	82	83	84	93

Source: Euromonitor (various years)

TABLE A5

Ownership of Goods around the World in 2000

	Clothes washer	Clothes dryer	Dishwasher	Refrigerator	Color television	VCR	Personal computer	Car
Algeria	6	2	3	76	69	8	4	26
Argentina	49	7	14	83	88	35	23	56
Brazil	24	2	6	82	86	18	24	41
Chile	45	7	2	61	59	30	18	42
China	2	1	1	6	45	1	14	3
Egypt	4	2	0	70	46	7	2	10
India	4	1	1	12	30	2	1	1
Indonesia	5	1	1	24	46	2	1	4
Japan	99	34	54	97	99	77	35	81
Jordan	9	2	6	66	91	27	9	27
Malaysia	80	26	2	97	90	67	24	64
Mexico	40	5	6	67	89	37	7	22
Nigeria	2	1	2	40	47	3	12	0
Pakistan	2	1	3	16	34	1	2	5
Philippines	8	6	1	38	63	22	2	8
South Africa	22	3	16	78	63	28	7	8
South Korea	68	32	3	98	92	68	27	44
Taiwan	94	22	4	99	99	58	31	51
Thailand	5	2	1	68	80	44	7	36
Tunisia	24	2	7	68	86	14	9	18
United States	78	71	54	100	99	97	64	93
Venezuela	38	5	3	80	90	28	10	47

Note: The table shows the percentage of households in the country owning the item in 2000.
Source: Euromonitor (various years).

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