The American "Special Century" of Economic Progress, 1870-1970

by Stu Rosenblatt

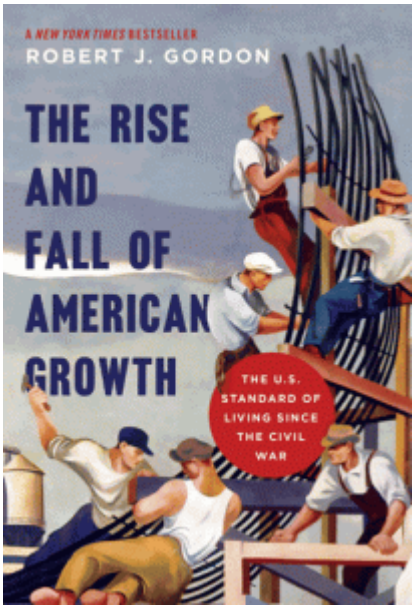
Editor's Note: The following is part one of a four-part review of a very useful book for those determined to return the American economy to productive growth. The full article will be available upon completion. The article has been edited by Bonnie James.

The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War

Robert J. Gordon

Hardcover; 784 pages; Princeton University Press (2016)

The Rise and Fall of American Growth is a landmark study of U.S. economic policy over the past 125 years. Focusing not on monetary or financial outcomes, but rather on the expansion, and later contraction, of physical production, the book is a welcome relief from the excess of banking-centered tomes. It paints a remarkable picture of the impact of technological progress in the nation, from the late 19th Century to the beginning of the 1970s, and offers a searing indictment of the early 1970's abandonment of that progress. Gordon develops new insights into the causes of the emergence of the United States as a great industrial power, while attacking many of the economic assumptions that have hindered serious appreciation of those breakthroughs.



His thesis is that the hundred-year period 1870-1970 represents a “Special Century” of durable economic growth, and that the period 1920-70 was the Golden Age of productivity gain and technological advance. He begins with the startling fact that real economic growth, measured in physical terms and increase in the standard of living, has only taken place in the last 200 years! From the dawn of what we might call modern civilization 100,000 years ago, the first 99,800 years were characterized by very little in the way of real expansion. The annual rate of growth on the planet was about 6% per century.

Gordon fails to acknowledge the correlation between population growth and critical scientific and technological expansion that occurred during and after the Renaissance in Europe in the 15th-16th centuries. Nor does he identify any of the offshoots of that movement, such as the prodigious accomplishments of 17th-Century France under Finance Minister Jean-Baptiste Colbert.

Nevertheless, his overall conclusion is sound. Until the advent of the American Revolution and the promotion of a manufacturing economy which began to take root in the United States in the 1820s, durable growth in the world changed little over centuries. Unfortunately, Gordon does not delve into the policy of Alexander Hamilton or his American System

protégés. Nor does he elaborate on the impact of the scientific breakthroughs that proliferated in the 19th Century, such as the discovery of electromagnetism, breakthroughs in thermodynamics, developments in basic chemistry, biology, etc.

His focus is on the gigantic impact of inventions and technologies that made their way into the economy and altered its trajectory upward. He points to the two big inventions that shaped the 20th Century beyond all else. They occurred in the same year, 1879: the inventions of the electric light bulb by Thomas Edison and the internal combustion engine by Karl Benz. Gordon traces the impact of those two defining innovations as "red dye" markers for the dramatic transformation of production in the United States.

Gordon recognizes that "some inventions are more important than others." He looks at the clustering of new inventions at the end of the 19th Century, whose implementation would take 40 years to be fully realized, as launching the Special Century.

Discarding the Shibboleths

Gordon's purpose in writing the book is to convey the monumental accomplishments of the U.S. economy during the Special Century, to examine the unprecedented increase in the standard of living, and to unearth the actual causes for the transformation. In the process, he discards as shibboleths the various economics truisms and measuring sticks, which have prevented serious analysis of real economic growth.

First, he repudiates the idea of a "steady-state economy" and says that his exposition proves that the real, physical, or productive economy moves upward in non-linear jumps. "Steady-state" economic theory assumes that a continuous flow of new ideas and technologies drive an economy forward, but the reality is that economic progress has been anything but

continuous. The period 1870-1970 represents a quantitative and qualitative leap above all previous history, and is not predictable from studying the previous centuries.

Electricity is one of the two major inventions Gordon credits with spurring productivity.

The flood of new technologies into the economy after the Civil War was generated by breakthroughs made in the first half of the 19th Century, which itself represented a definitive break over the previous periods. The Special Century is itself divided into three periods: 1870-1920, 1920-1950, and 1950-1970; the achievements of the 1930-50, however, period far surpass the earlier part of the century, as we shall see.

Also, Gordon is emphatic in overturning the assumption that Gross Domestic Product, GDP, or more precisely Real GDP, is a valid measure of the development of the standard of living or the economy. Real GDP is the total production of goods and services adjusted for price inflation, per member of the population, that is, real GDP per person. It is the widely accepted metric for analyzing an economy.

Gordon rejects this standard on several grounds: It omits many aspects of the quality of life for the citizenry; it woefully understates changes in prices for goods, especially newly introduced products, making real calculations all but impossible; and, finally, GDP entirely omits many new technologies until years or decades after their

introduction. Changes in prices—e.g., for gasoline, over decades, or new products, such as the introduction of indoor plumbing, air conditioning, automobiles, automatic washing machines, electrified tools, etc.—are not reflected in real GDP in many cases. The advent of the automobile, central to progress in the 20th Century, is not accounted for in GDP until 1935.

These innovations, incorporated into the growing and varied standard of living of the population, are a central theme of Gordon's study. Real GDP entirely misses much of the impact.

Total Factor Productivity

Gordon replaces real GDP theory with an in-depth investigation of productivity expansion, and especially Total Factor Productivity (TFP). He delves into changes in output of goods and services that were generated by new innovations in technology, and makes this his measuring stick. Gordon elaborates this concept from the outset of the book. He analyzes output per person, per hour, and hours per person, for the entire 100 years, especially in light of introduction of new industries.

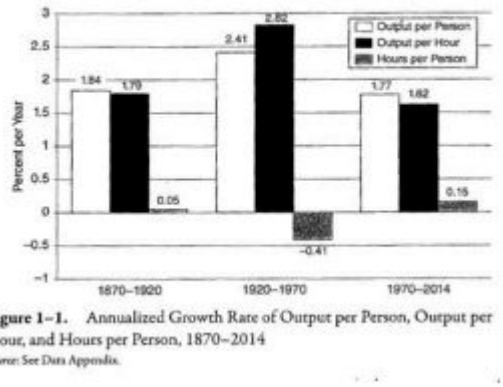


Figure 1–1. Annualized Growth Rate of Output per Person, Output per Hour, and Hours per Person, 1870–2014
Source: See Data Appendix.

His findings are eye-popping. He then divides the century into two sections, 1870-1920, 1920-1970, and adds the final period, 1970-2014 to complete his analysis. The first and last periods are almost identical in all statistics, while the middle period (1920-70) is significantly higher. Output per person is

much higher, individual hours are shockingly lower, and output per hour, productivity, is also significantly higher: 2.8% compared with 1.8% in the first, and 1.7% in the third. (See Figures 1-1 and 1-2).

Gordon's findings pose a useful paradox. Hours per person dropped dramatically in the middle period, yet productivity surged! He points to several causes of the fall in hours of labor, the most important being the labor reforms ushered in by the New Deal in the 1930s, resulting in the 8-hour day, 40-hour week, etc. But the most powerful marker appears in the dramatic rise in labor productivity.

Labor productivity is the driver of the process, so Gordon breaks that down further. He looks at education levels, which are relatively constant for all three periods; at the impact of capital input on labor hours (also called capital deepening), which is also relatively constant for the three time frames, and at what economist Robert Solow called "the residual." The residual is that which is unaccounted for in driving the overall rise in productivity. This segment is referred to as Total Factor Productivity, or Multi-Factor Productivity, and measures the impact of scientific and technological innovation on the economy. It is the measure for the success or failure of an economic system; the Special Century results jump off the page.

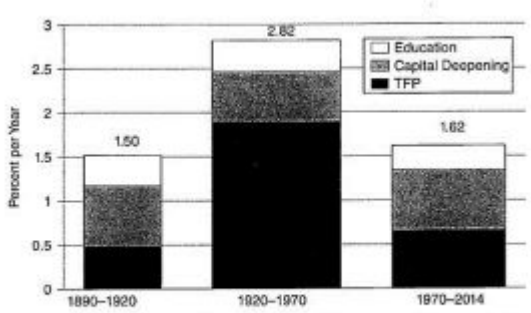


Figure 1–2. Average Annual Growth Rates of Output per Hour and Its Components, Selected Intervals, 1890–2014

Source: See Data Appendix.

TFP growth between 1920 and 1970 is triple the growth rate

registered in the preceding or succeeding periods! Within the period 1890-2014, the 1920-1970 period accounts for 66% of the TFP growth. Given that the contributions of education and capital deepening (ratio of capital input to labor hours) remain the same, the driving force is the innovation and technological development, also known as Total Factor Productivity.

Later, Gordon further investigates TFP and says that "labor productivity" can be subdivided into four categories:

> *1. Increases in labor quality, usually represented by changes in educational attainment*
>
> *2. Increases in the quantity of capital relative to the quantity of labor*
>
> *3. Increases in the quality of capital*
>
> *4. The leftovers, alternately called "total factor productivity" or "the residual," or even "the measure of our ignorance."*

While often treated as a measure of innovation and technical progress, the residual incorporates every aspect not just of major innovation but of incremental tinkering and anything else that improves efficiency, including the movement from low productivity jobs in agriculture to higher-productivity jobs in the cities. Gordon returns to TFP throughout the book, further refining its meaning. The first three-fourths of the book are devoted to his elaboration of the causes of the Special Century and their outcomes. (*to be continued)*