

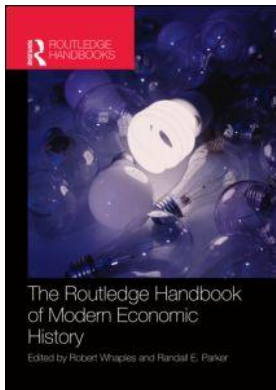
This article was downloaded by: 10.3.97.143

On: 08 Dec 2023

Access details: *subscription number*

Publisher: *Routledge*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: 5 Howick Place, London SW1P 1WG, UK



Routledge Handbook of Modern Economic History

Robert Whaples, Randall E. Parker

Measuring Economic Growth and the Standard of Living

Publication details

<https://www.routledgehandbooks.com/doi/10.4324/9780203075616.ch3>

Lee A. Craig

Published online on: 18 Dec 2012

How to cite :- Lee A. Craig. 18 Dec 2012, *Measuring Economic Growth and the Standard of Living from*: Routledge Handbook of Modern Economic History Routledge

Accessed on: 08 Dec 2023

<https://www.routledgehandbooks.com/doi/10.4324/9780203075616.ch3>

PLEASE SCROLL DOWN FOR DOCUMENT

Full terms and conditions of use: <https://www.routledgehandbooks.com/legal-notices/terms>

This Document PDF may be used for research, teaching and private study purposes. Any substantial or systematic reproductions, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The publisher shall not be liable for an loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

3

MEASURING ECONOMIC GROWTH AND THE STANDARD OF LIVING

Lee A. Craig

Defining the “standard of living”

Gross domestic product (GDP), the value of final goods and services produced within a country during a period of time, is the measure economists typically use to gauge aggregate economic activity in a modern nation state. It is essentially the sum of the product of prices and (final) quantities of goods and services destined for exchange in the market. The prices in this measure can be influenced by inflation (or deflation) – that is, a general increase (or decrease) in the price level unrelated to “real” economic activity. To control for these effects, economists hold prices constant for some “base year.”¹ This adjustment yields real GDP, which is purged of any inflationary (or deflationary) effect. Real GDP, then, is a key economic indicator, and its growth represents “economic growth.”

However, since real GDP captures aggregate economic activity, large countries will tend to have relatively large GDPs; conversely, small countries will have relatively small GDPs. For example, measured in U.S. dollars, in 2010 the real GDP of Indonesia is nearly four times larger than that of Norway (ADFAT 2011). However, per capita real GDP – that is, real GDP divided by population – is much higher in Norway than it is in Indonesia: \$52,239 versus \$4,380, again in 2010 U.S. dollars. Therefore, real GDP per capita, rather than GDP, is the standard economic indicator of “the living standard” within a modern nation state, and the growth of this measure is typically labeled an improvement in the standard of living.

Three intellectual milestones mark the history of measuring GDP, economic growth, and the standard of living. The first of these is the identification of the political or geographical unit that is to be measured. Exactly what constitutes an “economy”? More specifically, what are its political or geographical boundaries? The second addresses the conceptual issue of what represents economic activity within that unit, and how is that activity related to the standard of living. In other words, what economic activity or indicators are to be measured? Finally, there remains the practical question of how that economic activity is measured, and how its growth is characterized. What economic variables represent aggregate economic activity? Which of these measures the standard of living? And what does a higher standard of living mean? Since even the simplest notions of the economy, economic activity, and the standard of living involve many factors and variables, they necessarily have to be constrained in the actual measurement process for the concept of growth to be meaningful.

A history of measuring the standard of living

Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* is arguably the pivotal contribution to the measurement of economic growth. In his uniquely verbose way, Smith grappled with exactly the three issues posed earlier. What was the geographical or political unit to be measured? What constitutes the "wealth" of that unit? And how would one go about measuring it?

With respect to the unit to be measured, Smith's era saw the advance and proliferation of the nation state, which was emerging from the medieval fiefs and divine-right monarchies of earlier ages. Consequently, in Smith's view, and that of subsequent generations of economists, the nation state was the political *and* geographical unit of interest. Henceforth, we would speak of the English or the French or the American economy.

As for the conceptual issue of what to measure, although Smith chose the word "wealth" (an indicator of accumulated riches, what economists refer to as *stock* measure) to denote the concept for which he was grasping, his crucial insight was that the *flow* of goods and services consumed by a nation's citizens indicated the nation's wealth. He wrote, "Consumption is the sole end and purpose of all production ..." (Smith 1976, Vol. 2: 179). Even before the ink dried on the first edition of *Wealth of Nations*, economic writers were already leaning towards national "income" as a more propitious indicator than wealth of aggregate economic activity.² It followed that an economy that could generate a lot of goods and services for its citizens to consume was a wealthy economy. From personal observation, Smith supposed England was wealthy; Scotland was not; and France was somewhere in between – though he conjectured that Scotland was growing faster than France. However, he had no systematic way of confirming such suppositions. Thus, it was the third issue, the actual measurement of aggregate economic wealth (or income), that Smith struggled with, and he never generated anything like a formal system of national income accounting.

Smith's quest to understand and measure the wealth of a nation would clearly be classified by later generations of economists as "macroeconomic" in nature. Indeed, the issue practically defined the field of macroeconomics. One can also find in Smith's work topics that later generations would label as distinctly "microeconomic." One of his key insights was that the efficiency of a nation's individual producers (including his famous description of the division of labor in a pin factory) was the pillar upon which its aggregate wealth rested; that is to say, he recognized what economists today refer to as the "microfoundations" of macroeconomics. However, it was the actual counting and summing of economic activity that defeated him. When it came to the measurement of aggregate production, consumption, and wealth, Smith only offered anecdotal evidence, primarily examples and case studies from microeconomics, and that was where he left the subject.

The economists who came after Smith and took up his quest to understand the aggregate wealth of a nation largely proceeded along two paths, which, while not divergent by nature, did not in practice converge until well into the twentieth century. One of these paths was largely theoretical. Among the topics on which these so-called "classical economists" focused was "national" income. However, their emphasis was not so much on measuring it as understanding its source. Here they wandered into the minefield of the theory of value, the key juxtaposition of which, according to Smith, was what he called "value in use" versus the "value in exchange" (Smith 1976, Vol. 1: 32), the latter of which economists would eventually come to interpret as the market price. Smith hypothesized that the exchange value of a good was equal to the value of the labor used in the good's production. Subsequent economic theorists – including Thomas Robert Malthus, David Ricardo, and Karl Marx – wrestled with this so-called "labor theory of

value.” The issue was important, because mathematically the sum of the value of economic transactions over some period of time would offer an estimate of aggregate or national income.³

When it came to using the value of a transaction as the building block for aggregate income, the questions were: When such a transaction takes place, from whence did income come, and where did it go? And how was the value of the product distributed among the factors that produced it? This was what the classical economists referred to as the “distribution of the product.”⁴ Here then was the question around which modern national income accounting was constructed. Despite their focus on the labor theory of value, the classical economists recognized that labor was only one factor of production; its wage only one form of payment. Land, capital, and credit were others; and their payments were labeled rent, profit, and interest (Smith 1976, Vol. 1: 58–9). Smith had noted that private consumption was the primary objective of productive activity, but expenditures were made on more than just consumption, and to fully form the consumption side of the ledger economists eventually added investment activities, government purchases, and, reflecting the geographic boundaries of national income accounting, net exports. So the value of every final transaction represented a buyer’s consumption or investment, but it also generated a wage or profit for the producers.

While the classical economists struggled with the theoretical issues behind the source and distribution of national income, another less prominent group focused on the *measurement* of economic activity.⁵ Space prohibits a full accounting of the individuals who contributed to the evolutionary progress that led from Adam Smith to the modern national income and product accounts.⁶ However, a look at the work of four of the more prominent of these early academic “counters” gives one a feel for the evolution of the measurement of aggregate economic activity and hence economic growth. Two were Englishmen, Arthur Young and Thomas Tooke, and two were Americans, Henry Carey and David Wells. All offered seminal methodological and conceptual contributions to empirical economics.

Although he was 17 years Smith’s junior, Young, a successful writer and a less successful gentleman farmer, began accumulating and processing economic data even before the publication of *Wealth of Nations*. Because of the size of the agricultural sector in pre-industrial economies, it was common at the time to identify agricultural success with national economic success. And so, over a roughly 40-year period, Young collected microlevel data on farms in England, Ireland, and France. Importantly, he made the intellectual leap from the performance of an English farm to the performance of the English economy, writing that, “From the average [performance] of a great number [of farms] we may certainly be able to calculate with much truth the general state of the whole kingdom ...” (Young 1771: 367, as quoted in Allen and Ó Gráda 1988: 94). Antedating the work of the classical economists on the distribution of output, Young divided the sources of income between landowners, laborers, and capital, and he often wrote in conceptual terms that also antedated the wide use of real per capita GDP as the key standard-of-living indicator.⁷

Tooke, a financier, was born two years before the publication of *Wealth of Nations*, and, although he engaged in the debates with the classical economists on the distribution of the product and made original contributions to monetary theory, his most lasting contribution was his insistence on bringing data to bear on his arguments. He focused on the movements in agricultural prices, and his monumental *History of Prices and the State of the Circulation*, which ran to six volumes, established a model, not much followed at the time, for the scientific investigation of economic relationships.⁸ Tooke cast his net widely, studying, among other topics, money, banking, and distribution theory (Smith 2007), but it was his collection and use of data, including prices, the volume of credit and trade, and railway activity, that perpetuated his name.

Even more so than Tooke, Carey, born after Smith's death, rejected the abstract theorizing of the classical economists and "emphasized history and empirical observation" (Landreth and Colander 2002: 410–11), which, with a perspective of time not available to those earlier economists, revealed the unprecedented long-run economic growth generated by the Industrial Revolution. He argued, and attempted to demonstrate, that economic growth was driven by labor productivity – that is, output per worker – which was in turn driven by technological changes, which were happening all around. By tying the productivity of workers on the shop floor to aggregate living standards, Carey empirically established the link between micro-foundations and macrogrowth. Though his arguments were much ridiculed at the time,⁹ his empirical approach was subsequently much imitated.

Despite the contributions of these early counters, which were not fully appreciated at the time but which, in terms of measuring the wealth of a nation, were more important than those of their more famous classical colleagues, neither Young, nor Tooke, nor Carey articulated a set of national income accounts. However, Wells (born 1828) did. Like Young, Wells was a prolific writer on a diverse set of topics. Trained as an engineer, which perhaps helped discipline his mind to the rigors of constructing a set of accounts that would generate estimates of national income, Wells constructed what were arguably the first reliable estimates of national income. Indeed, in private correspondence, Simon Kuznets, the father of modern national income accounting, told Joseph Schumpeter that "Wells' estimates of [nineteenth-century national income] are deserving of confidence" (Schumpeter 1954: 524).

Despite Wells's breakthrough in national income accounting, in the late nineteenth century, the mainstream of Anglo-American economics revolved around price theory. John Stuart Mill's contributions on the theory of value and the subsequent work of Alfred Marshall dominated the scene.¹⁰ However, the work of Marshall's most prominent student, John Maynard Keynes, and the onset of the Great Depression revived interest in empirical macroeconomics. After *Wealth of Nations* and Marx's *Das Kapital*, arguably the most influential volume in the history of economic thought was Keynes's *General Theory of Employment, Interest and Money*, the first edition of which was completed in 1935. In it, Keynes referred to aggregate output as "output as a whole" (1935: *passim*), but he did not define this whole, even as competing theories that were emerging to explain the Depression cried out for such a measurement.

The creation of the national income and product accounts

Arguably, the person to whom the most credit is due for ultimately supplying that measurement is Simon Kuznets, the "patron saint" of national income accounting, according to Martin Feldstein (Feldstein 1990: 10).¹¹ Kuznets, born in Pinsk in 1901, in what was then Czarist Russia, migrated to the United States during his college years. After concluding his graduate studies, Kuznets began working with Wesley Mitchell at the National Bureau of Economic Research (NBER). Mitchell's work focused on identifying business cycles using various economic indicators, such as bank clearings and railroad traffic (an approach that had its antecedents in Tooke's *History*). Kuznets contributed to the effort by refining the measurement of output and capital formation, and in 1930 his early efforts yielded his first major work, *Secular Movements in Production and Prices*. Here Kuznets moved towards systematically doing for the whole economy what Arthur Young had unsystematically done for English agriculture; that is, he created a set of prices and quantities that when multiplied and summed could yield a single number that measured aggregate economic activity, an indicator of Adam Smith's wealth of a nation.

With the onset of the Great Depression, policy makers in Washington took a serious look at the work of academic economists, such as Kuznets, and in consultation with him, in 1934, the

United States Department of Commerce produced *National Income, 1929–32*, which became the standard reference volume for the construction of national income accounts. Kuznets immediately set about expanding the study, pushing it backward (to 1919) and forward (to 1935) in time (Kuznets 1937). However, in the process of that effort, he raised some terminological and methodological questions. The primary mechanism through which those questions would be addressed was the NBER's Conference on Research in Income and Wealth, which was created through Kuznets's efforts.¹²

Formed in 1936, the Conference first convened early in 1937 and met annually for several years. From those meetings came a series of volumes containing scholarly papers on, among other things, the measurement and growth of aggregate output. Through the Conference Kuznets refined his methods and in 1941 produced his masterpiece, *National Income and Its Composition, 1919–1938*, which explains in a thousand detailed pages the methodology for aggregating transactions across the whole economy into national income.¹³

With the creation of a systematic and comprehensive methodology, the way was set to go forward with the annual production of the national income and product accounts, an activity formally managed by the Bureau of Economic Analysis within the U.S. Commerce Department. Other countries and international organizations followed suit. But neither Kuznets nor the policy makers who funded and oversaw the Commerce Department were interested in national income accounting as merely an intellectual exercise. They wanted to analyze the sources of long-run economic growth, as well as the deviations from long-run trends, which drove the business cycle. For that purpose, simply moving forward one year at a time for several decades until enough data were collected to say something intelligent about the process was unacceptable. Thus Kuznets pushed his estimates backwards in time.

Casting backwards to generate real gross national product (GNP) figures for the nineteenth century, Kuznets eventually came up with estimates that went back to 1889 (Kuznets 1961). These were subsequently revised by many scholars using different methodologies and data. Figure 3.1 shows Kuznets's original series and four subsequent revisions. Although, at first glance, the series look similar, by the end of the period, a substantial difference emerges among them. Indeed, the highest and lowest figures for 1913 differ by 14 per cent, and the differences between the rates of growth between the fastest- and slowest-growing series is greater than one half of a percentage point per annum (4.04 per cent for Kendrick's estimates versus 4.61 per cent for Romer's). Although that might seem like a small difference, consider that in two lifetimes a difference of that magnitude would generate estimates of real GDP that differed by more than a factor of two!

Space constraints prohibit a detailed explanation of the different data and assumptions that went into generating the estimates in Figure 3.1; however, Kuznets's original methodology served as the base for all of them (Balke and Gordon 1989; Johnston and Williamson 2008; Kendrick 1961; and Romer 1989).¹⁴ A primary difference between the estimates is in the timing and magnitude of fluctuations in the business cycle. (Figure 3.2 shows the annual percentage changes in each series.) The average annual growth rate of the U.S. population between 1889 and 1913 was 1.90 per cent; thus the per capita growth rates of the series in Figure 3.1 range from 2.14 per cent to 2.71 per cent. Kuznets called this "modern economic growth," by which he meant aggregate growth rates that exceeded population growth rates by enough and for long enough that periodic downturns would not disrupt the long-run increase in the standard of living, as it was measured by per capita GDP (Kuznets 1966). Figure 3.2 reflects this phenomenon. Using, as an example, the Johnston and Williamson series, which has the median growth rate of the five series, and which goes back to 1870, we see that 13 of the 43 years show a decrease in real GDP, what might reasonably be called "recession" years, and

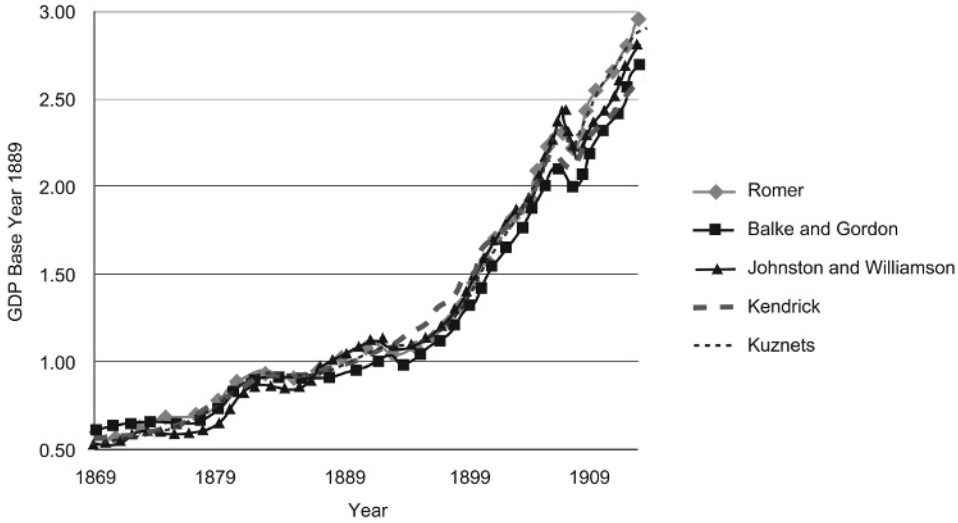


Figure 3.1 U.S. real GDP estimates, 1869–1913 (1889 = 1.00)
 Sources: Balke and Gordon (1989), Johnston and Williamson (2008), Kendrick (1961), Kuznets (1961), and Romer (1989).

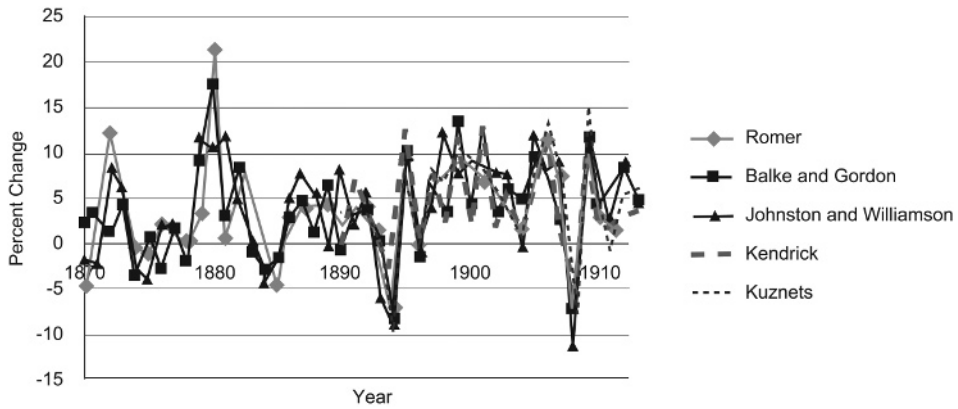


Figure 3.2 Annual per cent change in U.S. real GDP, 1870–1913
 Sources: Balke and Gordon (1989), Johnston and Williamson (2008), Kendrick (1961), Kuznets (1961), and Romer (1989).

that the average decrease in real GDP during those years was 3.4 per cent. The other 30 years were growth years, with a mean increase of 7.0 per cent. In short, the standard of living roughly doubled over this period because there were more good years than bad years, and on average the good years were better than the bad years were bad. This is Kuznets’s modern economic growth at work, and it is a fairly recent phenomenon in human history. In fact, Gregory Clark argues that, for the 3000 years before 1800, the average annual per capita growth rate of income was zero (Clark 2007).

Kuznets’s GDP per capita provided an indicator of the living standard, but it is not without flaws. Broadly speaking, scholars have grouped these into three categories: 1) failure to reflect the distribution of income, 2) omissions or flaws in the measurement of some types of economic activity, and 3) the under-appreciation of quality-of-life issues.¹⁵

With respect to the distribution of income, in essence, GDP per capita gives us the output available for an *average* person's consumption (and investment, government expenditures, and so forth). It tells us nothing about what a *typical* person would consume. An economy could grow substantially; GDP per capita could indicate a rising standard of living; but, if all of the growth is enjoyed by, say, the top 20 per cent of the income distribution, the standard of living of the typical person or family would remain unchanged. Thus countries that appear to have a high standard of living, as measured by GDP per capita, could in fact be populated by masses of miserably poor families. In practice this is not the case. Among a large sample of countries from around the world, there is strong positive correlation between the growth of GDP per capita and the average income of the poorest 20 per cent of the population (Dollar and Kraay 2002).

As for its omissions, GDP per capita omits non-market activity, illegal activity, and the value of time spent at leisure. If you clean your house, then that economic activity does not show up in GDP; if you pay someone else to do it, it does. If your doctor writes a prescription for you and you purchase medicine from a pharmacy, then that economic activity shows up in GDP; if you purchase a controlled substance from a kid down the street, it does not. You might place a high value on fishing with your daughter, but the activity will not show up in GDP per capita. In short, GDP per capita probably understates the "true" standard of living. Furthermore, since average annual hours worked have declined by roughly 40 per cent over the past century or so in the world's richest countries (Huberman and Minns 2007), GDP per capita understates the growth in the standard of living over that time period.

Finally, one of Kuznets's students, Richard Easterlin, has argued that GDP suffers from its inability to reflect the quality of life, variously defined. In particular, he argues that there is no correlation between people's happiness and GDP per capita in the countries in which they live. This is the so-called Easterlin Paradox (Easterlin 1974). Kuznets recognized these shortcomings.¹⁶ In 1971, he received the Nobel Prize for his contributions to national income accounting, and in his Nobel address, subsequently published in the *American Economic Review*, he cautioned economists and policy makers against relying too much on real GDP or real GDP per capita as an economic indicator. He emphasized the "problem aspects of modern economic growth," which, in his view, included unexpected and "negative results" on the quality of life in industrializing countries (Kuznets 1973: 257). He hypothesized that the result might be a positive relationship between growth and the standard of living on the one hand (both conventionally measured by GDP per capita) and an increase in the inequality of the distribution of income on the other. This relationship came to be known as the "Kuznets curve."

Biological measures of the standard of living

Another student of Kuznets, Robert Fogel, himself a future Nobel Prize winner, recognized that the deterioration of the quality of life and an increase in inequality could show up in "biological indicators" of the standard of living (Fogel 2004). Among the indicators Fogel and his students focused on was human physical stature, the study of which is called "anthropometrics." The anthropometricians argued that stature serves as a good indicator of the biological well-being of a population, arguably better than per capita GDP. The consumption of nutrients – net of those exhausted during work or from fighting disease – determines whether *homo sapiens* achieve their genetic height potential. Thus stature differs from GDP per capita in that it reflects the consumption of nutrients and the biological costs associated with the production of goods and services; thus it reflects the distribution of economic output as manifest in consumption. The intensity of effort and number of hours worked, as well as working and living conditions,

determine the body’s demand for nutrients. When humans work harder for longer periods, or when they fight off disease, they are left with fewer nutrients for growth.

Net nutritional status, the key to human growth, is the difference between nutritional inputs and the demands of work, body maintenance, and disease. Before adulthood, a positive net nutritional status stimulates growth, while a negative net nutritional status will retard growth, *ceteris paribus*, of course.¹⁷ Thus adult stature can be viewed as a “cumulative indicator of net nutritional status over the growth years” (Cuff 2005: 10). Changes in nutrition, working conditions, and disease environment can all influence net nutritional status, and the disease environment itself reflects public health measures (or the lack thereof), urbanization, and economic growth. Hence, stature can reveal information about the distribution of income or wealth that might be hidden in real GDP or even real GDP per capita. An economy experiencing modern economic growth and hence sustained increases in real GDP per capita, which we typically think of as indicating an increasing living standard, might be experiencing an increasingly unequal distribution of income (the Kuznets curve), such that the welfare effects of growth are not widely spread and in fact result in a worsening of the biological standard of living.

The early anthropometric work confirmed Kuznets’s and Fogel’s suspicions. Figure 3.3 shows the growth in real per capita GDP in 2000 dollars and the mean adult stature of white males for the United States from 1800 through 1920. As the earlier discussion notes, the GDP figures reflect the modern economic growth that sprung from the Industrial Revolution. However, the stature data reveal a troubling decline throughout the earlier decades of the nineteenth century. This so-called “antebellum paradox” has been much studied by economic historians in recent decades (see Chapter 4 in this volume), and their research suggests that, as Kuznets hypothesized, the disamenities of urbanization and industrialization initially overwhelmed their positive effects on the standard of living. Thus, although aggregate economic activity expanded more rapidly than population, generating modern economic growth, that growth did not necessarily generate an improvement in the standard of living, at least as measured by biological indicators.

If nothing else, the history of measuring economic growth teaches us that it is often unhelpful to become too dogmatic about a particular set of output estimates. As Kendrick, one of the most important contributors to the measurement of economic activity and growth noted, “there is no unique definitive set of national product estimates. The selection depends on the theoretical predilections of the estimator, the analytical purpose of the user, and the availability

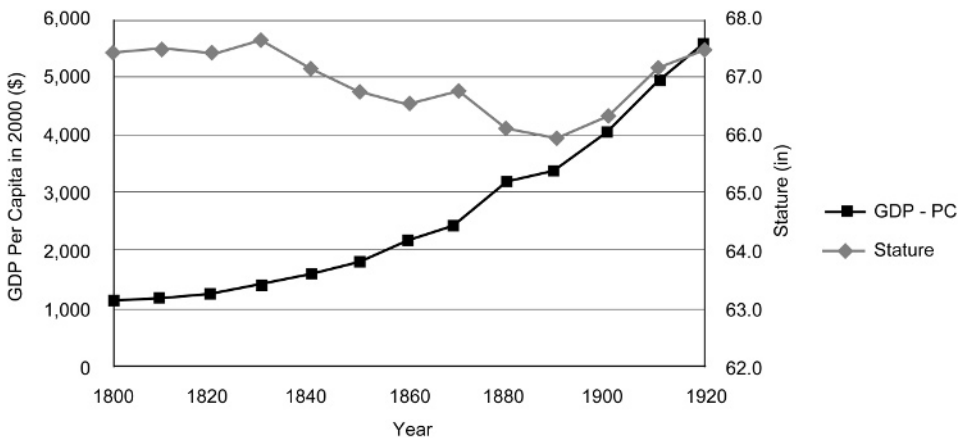


Figure 3.3 U.S. real GDP per capita and (white) adult male stature, 1800–1920
Sources: Johnston and Williamson (2008), Chanda *et al.* (2008).

of data” (1961: 21–2). In short, the successful measurement of aggregate economic activity, the standard of living, and economic growth answered many important questions in economics. It also raised many new ones. Both are important contributions to human progress.

Notes

- 1 Or by “chaining” them to recent time periods (Cage *et al.* 2003).
- 2 In modern corporate accounting, the notions of flows and stocks, income and wealth are reflected in the income statement and the balance sheet, respectively.
- 3 The question was originally addressed by William Petty, who antedated Adam Smith by more than a century. See Ekelund and Hébert (1983: 91).
- 4 In his “Plan of Work,” Smith labeled the explanation of “how produce is naturally distributed” the primary objective of the first volume of *Wealth of Nations* (Smith 1976, vol. 1: 2).
- 5 Schumpeter collectively referred to their efforts as “factual work” (1954: 519–26).
- 6 For a concise discussion of many other important contributors, see Schumpeter’s appropriately entitled chapter “Review of the troops” (1954: 463–526).
- 7 See, for example, Mingay (1975: 184–7).
- 8 The final two volumes were co-authored with a protégé, William Newmarch, who himself made original contributions to the collection and processing of economic data (Schumpeter 1954: 520).
- 9 Referring to one of Carey’s volumes, John Stuart Mill said it was the “worst book on political economy I ever toiled through” (Schumpeter 1954: 516).
- 10 This is not to say that there were no important contributions to macroeconomics during this period. Indeed W.S. Jevons’s work on index numbers, to give but one example, which was motivated by Tooke’s earlier work on prices, was crucial to the subsequent construction of “real” GDP (Ekelund and Hébert 1983: 321–2).
- 11 In the UK, the task was initiated by two future Nobel laureates, James Meade and Richard Stone.
- 12 Carson (1990) offers a concise history of the Conference.
- 13 Kuznets subsequently refined his national income estimates to yield “gross national expenditure,” which eventually became GNP, the value of final goods and services produced by the labor and property supplied by a nation’s households, even if located in a foreign country. In the United States this measure was subsequently replaced by GDP in 1991. See United States Department of Commerce (2011).
- 14 Although Johnston and Williamson do not cite Kuznets directly, they do cite Kendrick, whose debt to Kuznets is explicit (Kendrick 1961).
- 15 There is a large literature on the flaws and omissions in national income accounting. For a reasonably concise summary, see Stiglitz *et al.* (2010). For an even more concise summary of why GDP per capita is nonetheless a good measure of the standard of living, see Hubbard and O’Brien (2010: 147–51).
- 16 It should be noted that recent research rejects the Easterlin Paradox. See, for example, Stevenson and Wolfers (2008).
- 17 Of course, there is a biological maximum to stature. Further consumption beyond that point merely leads to obesity (Komlos *et al.* 2008).

References

- Allen, R.C. and Ó Gráda, C. (1988) ‘On the road again with Arthur Young: English, Irish, and French agriculture during the industrial revolution’, *Journal of Economic History*, 48: 93–125.
- Australian Department of Foreign Affairs and Trade (ADFAT) (2011) ‘Fact sheets’, <http://www.dfat.gov.au/geo/fs/nway.pdf>
- Balke, N.S. and Gordon, R.J. (1989) ‘The estimation of prewar gross national product: methodology and new evidence’, *Journal of Political Economy*, 97: 38–92.
- Cage, R., Greenlees, J. and Jackman, P. (2003) ‘Introducing the chained consumer price index’, paper presented at International Working Group on Price Indices, Paris, May 2003.
- Carson, C.S. (1990) ‘The conference on research in income and wealth’, in E.R. Berndt and J.E. Triplett (eds) *Fifty Years of Economic Measurement: The Jubilee of the Conference on Research in Income and Wealth*, Chicago, IL: University of Chicago Press.

- Chanda, A., Craig, L.A. and J. Treme (2008) 'Convergence (and divergence) in the biological standard of living in the USA, 1820–1900', *Cliometrica*, 2: 19–48.
- Clark, G. (2007) *A Farewell to Alms: A Brief Economic History of the World*, Princeton, NJ: Princeton University Press.
- Cuff, T. (2005) *The Hidden Cost of Economic Development: The Biological Standard of Living in Antebellum Pennsylvania*, Aldershot: Ashgate.
- Dollar, D. and Kraay, A. (2002) 'Growth is good for the poor', *Journal of Economic Growth*, 7: 195–225.
- Easterlin, R. (1974) 'Does economic growth improve the human lot?' in P. David and M. Reder (eds) *Nations and Households in Economic Growth: Essays in Honor of Moses Abramowitz*, New York: Academic Press.
- Ekelund, R.B. and Hébert, R.F. (1983) *A History of Economic Theory and Method*, 2nd edition, New York: McGraw Hill.
- Feldstein, M. (1990) 'Luncheon in honor of individuals and institutions participating in the first income and wealth conference', in E.R. Berndt and J.E. Triplett (eds) *Fifty Years of Economic Measurement: The Jubilee of the Conference on Research in Income and Wealth*, Chicago, IL: University of Chicago Press.
- Fogel, R.W. (2004) *The Escape from Hunger and Premature Death, 1700–2100: Europe, America, and the Third World*, New York: Cambridge University Press.
- Hubbard, R.G. and O'Brien, A.P. (2010) *Macroeconomics*, 3rd edition, Boston, MA: Prentice Hall.
- Hubbard, G., O'Brien, A. and Rafferty, M. (2012) *Macroeconomics*, Boston, MA: Prentice Hall.
- Huberman, M. and Minns, C. (2007) 'The times they are not changin': days and hours of work in old and new worlds, 1870–2000', *Explorations in Economic History*, 44: 538–67.
- Johnston, L.D. and Williamson, S.H. (2008) 'What was the U.S. GDP then?' MeasuringWorth, <http://www.measuringworth.org/usgdp/>
- Kendrick, J. (1961) 'Productivity trends in the United States', National Bureau of Economic Research, <http://www.nber.org/books/kend61-1>
- Keynes, J.M. (1935) *The General Theory of Employment, Interest and Money*, New York: Harcourt Brace Jovanovich.
- Komlos, J., Breitfelder, A. and Sunder, M. (2008) 'The transition to post-industrial BMI values among U.S. children', National Bureau of Economic Research Working Papers, No. 13898.
- Kuznets, S. (1930) *Secular Movements in Production and Prices*, Boston, MA: Houghton Mifflin.
- (1937) *National Income and Capital Formation, 1919–1935*, New York: National Bureau of Economic Research.
- (1941) *National Income and Its Composition, 1919–1938*, New York: National Bureau of Economic Research.
- (1961) *Capital in the American Economy: Its Formation and Financing*, Princeton, NJ: Princeton University Press.
- (1966) *Modern Economic Growth: Rate, Structure and Growth*, New Haven, CT: Yale University Press.
- (1973) 'Modern economic growth: findings and reflections', *American Economic Review*, 63: 247–58.
- Landreth, H. and Colander, D.C. (2002) *History of Economic Thought*, 4th edition, Boston, MA: Houghton Mifflin.
- Mingay, G.A. (ed.) (1975) *Arthur Young and His Times*, London: Macmillan Press.
- Romer, C. (1989) 'The prewar business cycle reconsidered: new estimates of gross national product, 1869–1908', *Journal of Political Economy*, 97: 1–37.
- Schumpeter, J.A. (1954) *History of Economic Analysis*, New York: Oxford University Press.
- Smith, A. (1976) *An Inquiry into the Nature and Causes of the Wealth of Nations*, Chicago, IL: University of Chicago Press.
- Smith, M. (2007) 'A survey of Thomas Tooke's contributions to political economy', *History of Economics Review*, 46: 106–35.
- Stevenson, B. and Wolfers, J. (2008) 'Economic growth and subjective well-being: reassessing the Easterlin paradox', *Brookings Papers on Economic Activity*, 39: 1–102.
- Stiglitz, J., Sen, A. and Fitoussi, J-P. (2010) *Mismeasuring Our Lives: Why GDP Doesn't Add Up*, New York: New Press.
- United States Department of Commerce (1934) *National Income, 1929–32*, Washington, DC: Government Printing Office.
- United States Department of Commerce, Bureau of Economic Analysis (2011) 'Concepts and methods of the U.S. national income and product accounts', <http://www.bea.gov/national/pdf/NIPAhandbookch1-4.pdf>
- Young, A. (1771) *The Farmer's Tour Through the East of England*, vol. 4, London: W. Strahan.