

Capital [i.e. Wealth] in the Nineteenth Century: Definition, Distribution, and Disposition

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ABSTRACT

The title is intended to signal that this paper is a commentary on *Capital in the Twenty-First Century* by Thomas Piketty. The editorial insertion in the title calls attention to the point that “capital” as defined by Piketty is not the reproducible tangible capital that contributes to the production of output, the argument **K** in the economist’s production function. Rather Piketty defines “capital” as marketable (i.e., “bequeathable” wealth) at current market prices.

Piketty’s major focus is on the increasing magnitude of the ratio of national marketable wealth to national income over the last 25 to 30 years – where the data on wealth is fairly good – and his prediction that there will be further increases in this ratio and a growing concentration of wealth at the top as the twenty-first century unfolds. He has much to say about wealth and inheritance in the twentieth century. For the United States he also presents some speculative evidence for the nineteenth century. Piketty’s prediction about a worsening wealth distribution depends critically on his assertion that a strong bequest motive dominates the life-cycle motive for wealth accumulation. Inheritance, he suggests, is the major force that is propelling increasing wealth inequality.

The contribution of this paper is to explore wealth acquisition, the distribution of marketable wealth, and the magnitude of inherited wealth in the late **nineteenth century U.S.** For that era I find an abundance of evidence for life-cycle saving (even among industrial workers) and little support for a strong bequest motive (even among the wealthy). This does not mean that wealth inequality was not a serious problem during the Gilded Age nor that it is not a serious problem today, but my findings do challenge Piketty’s conclusion that inheritance has always been a driving mechanism producing growing concentrations of wealth and power in capitalist America. As a consequence his “fundamental laws” regarding the dynamics of capitalism may need to be reexamined. To develop effective policy to counter inequality, we need a better understanding of the forces driving the distribution of wealth over the life cycle of the household and over the population of households in the economy.

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*Everybody knows the fight was fixed
The poor stay poor, the rich get rich
That's how it goes
Everybody knows*

...
*Everybody knows the deal is rotten
Old Black Joe's still pickin' cotton
For your ribbons and bows
And everybody knows*

Leonard Cohen¹

The distributions of income and wealth in the United States have recently become an issue of broad public interest and partisan controversy. Beginning with the Occupy Wall Street encampments in Zuccotti Park, September through December of 2011, popular attention has been focused on the disparity between those occupying the top 1 percent of the wealth distribution and the bottom 99 percent. Informed by an article written by Joseph Stiglitz for *Vanity Fair* which appeared in May 2011, the protestors claimed that the top 1 percent controlled 40 percent of the nation's wealth.²

The level of salaries paid to top executives has become a routine feature not only of business-page news but of the opinion editorials as well [Velasco 2014]. To many Americans the compensation packages for top management not only appear exorbitant, but also seem to bear

¹ "Everybody Knows" lyrics by Leonard Cohen and Sharon Robinson © Sony/ATV Music Publishing LLC, Universal Music Publishing Group. "Everybody Knows" was first released on Cohen's Columbia Records album *I'm Your Man*, February 1988.

² An excellent and detailed history of the Occupy Movement is available from Wikipedia [2014]. Stiglitz's 2011 article in *Vanity Fair* does not include source references. Stiglitz's book, *The Price of Inequality*, cites Edward Wolff's analysis of the U.S. Survey of Consumer Finance [Stiglitz 2012: note 4, p. 377]. Wolff estimates the marketable wealth owned by the top 1 percent in 2007 at 34.6 percent of the national total, and the percent of wealth excluding the equity of the household's primary residence to be 42.7 percent of the national total [Wolff 2010: Table 2, p. 44]. The reason given for considering this second definition is that "non-home wealth is a more liquid concept than marketable wealth, since one's home is difficult to convert into cash in the short term. Moreover, primary homes serve a consumption purpose besides acting as a store of value. Non-home wealth thus reflects the resources that may be immediately available for consumption expenditure or various forms of investments" [p. 7]. Marketable wealth excludes consumer durables and the value of future pension benefits from both private plans and Social Security.

little relationship to the contributions made by the individuals receiving it. For example, Paul Krugman writing in the *New York Times* observed:

Executive pay, which has skyrocketed over the past generation, is famously set by boards of directors appointed by the very people whose pay they determine; poorly performing C.E.O.'s still get lavish paychecks, and even failed and fired executives often receive millions as they go out the door [Krugman 2011].

The Occupy Movement has been seen as a failure that produced no lasting changes. Most executive compensation plans have remained as generous as ever (and are becoming more so) despite attempts to reign in the most egregious packages at prominent companies [Das, Esterl, and Lublin 2014]. However, a new energy has been injected into the debate with the publication of an English translation of Thomas Piketty's, *Capital in the Twenty First Century*. Piketty's goal is "putting the distributional question back at the heart of economic analysis" [2014: 15]. He finds that *income inequality* as measured by the proportion of the total income received by the top 1 percent in the U.S. has exploded in recent years and is now "probably higher than in any other society at any time in the past, anywhere in the world" [p. 265 and Figure 8.5 at p. 291].

What has attracted the most popular attention, however, is his prediction of ever-*increasing* concentrations of wealth. The take-away message of the book is this:

It is almost inevitable that inherited wealth will dominate wealth amassed from a lifetime's labor by a wide margin, and the concentration of [wealth] will attain extremely high levels – levels potentially incompatible with the meritocratic values and principles of social justice fundamental to modern democratic societies [Piketty 2014: 26, 377-378].

This "remarkable claim" implies that, as Paul Krugman suggested, we are "on a path back to 'patrimonial capitalism,' in which the commanding heights of the economy are controlled not by talented individuals but by family dynasties" [Krugman 2014].

Without denying the dangers or likelihood of the increasing control of wealth by the top 1 percent, this paper will suggest that the inheritance mechanism alluded to in this passage has probably been exaggerated because of a failure to appreciate the full range of motives for accumulating and holding wealth. To convince you of that, I take a somewhat counterintuitive

approach. Rather than (re)analyzing recent data on the distributions of income and wealth from France or the United States, I cast an eye back to the nineteenth century and focus on saving and wealth in America's Gilded Age.³ The story of the Gilded Age, populated by "Robber Barons," "captains of industry," and "empire builders," is fascinating reading, simultaneously colorful and insightful. Yet, less frequently told is the story of the working men and women of this age of gilt and glitter.⁴ As it turns out, these anonymous folks were the savers: the true financiers of American economic growth. The *low finance* of those with modest income deserves as much attention and credit as the high finance of the opulent citizens of Manhattan and Newport. That other story is also fascinating, colorful, and insightful. It just might change your view of the Gilded Age.⁵

My focus on the nineteenth century is not an entirely discordant intrusion into the debate given Piketty's own methodology. His analysis is essentially that of an economic historian. Alexander Field's review for the *Journal of Economic History*, for example, praises the book as "both an exemplary work in quantitative economic history and economic literature in the finest sense, written with the Cartesian clarity we associate with the French scientific tradition" [Field 2014: 916]. Piketty's quantitative history covers the two centuries spanning 1810 to 2010 and presents data on the share of national wealth owned by the top 1 percent and the top 10 percent for France, Britain, and Sweden. These are countries with reliable data on wealth drawn from

³ For American historians the period beginning with the end of the Civil War and ending sometime around 1917 (as dated by the first confiscatory income tax [Sutch 2014, SSHA paper: Figure 2]) is known as the "Gilded Age." That enduring appellation was assigned at the outset of the period by Mark Twain in the novel co-written with Charles Dudley Warner, *The Gilded Age: A Tale of Today* [1873]. The authors were suggesting that they were living during a false "golden age," gilded on the surface but base and vulgar underneath.

⁴ Peter Lindert has criticized Piketty for concentrating attention on the top ranks of the income and wealth distributions and neglecting those with "non-elite incomes" [2014: 11-12].

⁵ Periodization provides handy shorthand for identifying the historical processes and continuities under discussion, but the practice can also mislead by focusing too much attention on the lone characteristic captured in the era's name.

state archives that preserved reports on estate or inheritance taxes.⁶ He also presents estimates, somewhat less robust than those for Europe, for the top 1 percent of adults in the United States based on the U.S. estate tax beginning in 1916 [Wojciech Kopczuk and Emmanuel Saez 2004] and the top 1 percent of spending units (essentially family members living together) based on the Federal Reserve’s Survey of Consumer Finance beginning in 1962 [Kennickell 2009: Table 4, p.35].⁷

For the United States in the nineteenth century Piketty presents only a single data point, 32 percent for 1870. This is the proportion of the national wealth held by the top 1 percent based on the extract by Lee Soltow from the census of wealth taken at the time of the 1870 Census of Population [1975]. Piketty says, however, in the *Technical Appendix* to his book, that “huge uncertainties exist on these estimates” [Piketty 2014: 58].⁸ Other than a few passing comments about “industrialists and financiers” (that infamous trio of Carnegie, Morgan, and Rockefeller) during the Gilded Age, Piketty makes no effort to put the American data for the period before 1916 into any kind of historical context [358-349, 506]. This point is not meant to detract from painstaking empirical research on the trends *after 1916* and particularly those of the last twenty-five years. Lawrence Summers rather hyperbolically (and, I might comment, prematurely [see

⁶ An estate tax is levied on the remaining assets of the decedent. An inheritance tax is levied on the assets received by the beneficiaries. If there is more than one recipient, then the two forms of taxation are not equivalent. In popular use these two terms are interchangeable, which can lead to some confusion.

⁷ Wojciech Kopczuk reviews the reliability of the twentieth century data for the U.S. He suggests “Overall, the existing evidence on what happened to the concentration of wealth in the last few decades is not conclusive” [2014: 20]. In addition to the data on the wealth of the top 1 percent, Piketty presents a chart of the trends in the share of wealth owned by the top 10 percent [2014: Figures 10.5 and 10.6, pp. 348 and 349]. Unfortunately, for the years before 1962 these numbers are fabricated in a manner that I regard as unreliable. In an appendix I have provided a discussion of why these results should be disregarded.

⁸ In addition to his book, Piketty has made available an online *Technical Appendix* that gives sources and methodological details. Piketty cites the source for the 1870 observation as Lee Soltow as interpreted and reported by Peter Lindert [2000 *Three Centuries*: 188]. Both Soltow and Lindert give the total assets for the top 1 percent as 27 percent. Since Piketty wants net worth, not total assets, he adjusted Soltow’s figure upward but offered no discussion of how he came by this adjustment. See my discussion of this in the appendix to this paper. Piketty also plots a point in his Figure 10.5 for 1810. Despite his statement that it too comes from Lindert, Lindert has no observation to report anywhere near that date. Instead, as described in my appendix, Piketty used a rather dubious procedure to extrapolate from data based on probate records recorded around 1774, thirty-six years earlier.

my appendix]) deemed that that effort alone is “a Nobel Prize-worthy contribution” [Summers 2014]. Yet the weakness of Piketty’s nineteenth century data is reason enough to see what more might be said.⁹ After all, he prophesizes that the Gilded Age of Robber Barons dating from the late nineteenth century will be returning soon. According to Paul Krugman it has already arrived [2014].

Another reason to take seriously the available data from nineteenth-century America is that in addition to the 1870 Census of Wealth we have several remarkable data sets on the saving behavior of working-class families. These were government surveys undertaken in the period dating from the mid-1880s to 1900. They provide household-level quantitative information on family structure, demographic characteristics, occupations and wages, incomes, expenditures, savings, and asset holdings. Some of the reports also provide responses to retrospective questions concerning savings, incomes, and productivity.¹⁰ The two types of data, the savings surveys and the wealth census, taken together allow us to expand our focus from Piketty’s emphasis on the top 1 percent to the inequalities among the other 99 percent.

The nineteenth century perspective obtained from these sources allows me to examine the typical motivations for acquiring wealth during the Gilded Age, a key episode for Piketty’s narrative history. The prediction of the predominance of inheritance over saving in the twenty-first century is based on a key *assumption* by Piketty that wealth accumulation is primarily motivated by an altruistic desire to leave a bequest to children and grandchildren and is not significantly influenced by precautionary, retirement, or any other motives. The source of most

⁹ This paper is about the distribution of bequeathable *wealth* in the nineteenth century. Piketty gives equal weight to his estimates of the trend in the distribution of earned *income*. Interpreting this trend over the long run is a much more complicated task than for the distribution of wealth for a number of reasons. Patterns by age of labor force participation have changed over time as periods of non-employment during retirement and post-high-school education have become increasingly common. The figures that Piketty uses are before taxes and exclude transfers, gifts, employee benefits both public and private, and deferred compensation. The impacts of each of these have varied considerably over time thus affecting the evolution of income inequality. In any case, consistent data on these elements would be difficult to assemble for a lengthy period; data for the nineteenth century is virtually nonexistent.

¹⁰ A description of the Historical Labor Statistics Project which collected and coded this data is provided by Susan Carter, Roger Ransom, and Richard Sutch [1991].

wealth in the hands of individuals, by that assumption, is the intentional inheritances passed from one generation to the next [Piketty 2014: 428, also see Piketty and Zucman 2014: 22-23, 32-33]. This assumption is surprising in the light of the fact that the economics profession has come to a widely-shared consensus that the life-cycle hypothesis of saving is the primary explanation for saving and wealth holding.

The life-cycle model, originally due to the contributions of Franco Modigliani and Richard Brumberg [1954], embodies both the precautionary motive and the retirement motive for saving and downplays the significance of an altruistic bequest motive. In 2002 a classic paper published in the *American Economic Review* described the life-cycle model as “the workhorse of consumption and saving research for the past four decades” [Dynan, Skinner, and Zeldes 2002: 274]. The Berkeley economist and prominent blogger, Bradford DeLong, referred without qualification to a broad conclusion by economists that bequests *do not* play “an overwhelming role in the wealth accumulation of any cohort” [DeLong 2003: 33]. Even Piketty concedes that the life-cycle model is “taught to all students of economics” [2014: 391].

To sustain the credibility of his alternative view, “Piketty casts doubt on the current empirical validity of ... the Modigliani life cycle saving hypothesis” [Field 2014]. He is very explicit: “In quantitative terms ... [the life-cycle hypothesis] is not the primary mechanism at work” [Piketty 2014: 245]. “Clearly, saving for retirement is only one of many reasons – and not the most important reason – why people accumulate wealth” [391]. “The massive dissaving by the elderly predicted by the life-cycle theory of saving does not seem to occur” [400]. Piketty makes these assertions to discredit the life-cycle hypothesis; however, he provides no empirical data of his own to support his doubt. But, these assertions have been rejected by most recent studies.¹¹ Few who have reviewed the literature would take the hard line against the relevance of the life-cycle theory that is adopted by Piketty.

¹¹ Despite considerable and vigorous debate the life-cycle hypothesis has stood up well to both theoretical challenge and empirical test. In 1983 it could be fairly said that there was an “absence of a coherent alternative model” of saving [King 1985: p. 3 in the 1983 working paper version]. It is well known, however, that several early cross-sectional studies employing post-war twentieth century data (largely from the late 1960s and the 1970s) failed to observe dissaving in old age; some even reported a tendency for saving and wealth to increase after age 65 [see, e.g.,

Settling the issue of the relative importance of the life-cycle motive and the bequest motive is important for making predictions for the coming century. Piketty's concern about the dynamics of accelerating wealth inequality may be explained something like this [2014: Chapter 11]. The very wealthy (say the top ten percent) will be able to earn a flow of returns on their assets from rents, interest, and dividends that will be greater than they care to spend on themselves. They might consider this a great advantage since it would give them the means and the time to engage in philanthropy.¹² Many of the super wealthy of the Gilded Age are famous for the philanthropies they founded and the charities they funded. Carnegie, for example, expressed his own commitment when he announced that "The man who dies thus rich dies disgraced" [1889 "Wealth": 664]. Piketty ignores this possibility in the modern world (the book's index does not contain an entry for "philanthropy"). Presumably the wealthy of the twenty-first century will not have the same sense of duty, which animated Carnegie – the duty "to consider all surplus revenues which come to him simply as trust funds ... [to be used] to produce the most beneficial results for the community" [1889: 661-662].¹³ Piketty also ignores the possibility of spending the entire flow of asset earnings on consumption. Certainly, the Gilded Age offers many examples of extreme spending as a visit to the tourist attractions of Newport, Rhode Island would reveal. What will hold back such extravagance in the decades to come? For Piketty the only answer he considers is a strong bequest motive. Thus his key assumption that wealth accumulation is primarily motivated by a desire to leave an estate to children and grandchildren.

Andrew Carnegie asked:

Mirer 1979: 435; Danziger et al. 1982/83: 224; Attanasio 1994: 121]. A number of more recent studies, however, have shown this observation to be wrong. Bequeathable wealth, in fact, declines with age in cross-section [Hurd 1990: 610-614]. "Bequeathable wealth" excludes annuity wealth such as the present value of future Social Security benefits. Since annuity wealth *by definition* declines with age during the years that benefits are paid, the sum of bequeathable and annuity wealth must also decline in the cross-section.

¹² It is possible to distinguish philanthropy from charity. The former endows an institution and is administered for the "common good." Charity is doled out in small sums to individuals.

¹³ Piketty does not explain why this loss of duty has occurred nor does he present evidence that it has diminished.

Why should men leave great fortunes to their children? If this is done from affection, is it not misguided affection? ... [I]t is not well for the children that they should be so burdened. ... Wise men will soon conclude that, for the best interests of the members of their families and of the state, such bequests are an improper use of their means.” [Carnegie 1889: 658]

Carnegie would think that Piketty is predicting a twenty-first century where the wealthy are neither dutiful nor wise. But, clearly, Piketty is also rejecting a view of the Gilded Age populated by wealthy, wise, and public spirited men like Carnegie.

Piketty reports that wealth inequality “in all countries and all periods for which data is available” “is always greater than income equality with respect to labor” [Piketty 2014: 244]. He claims that this fact requires a behavioral motivation for accumulating wealth beyond the life-cycle motive.

If wealth is accumulated primarily for life-cycle reasons (saving for retirement say), as Modigliani reasoned, then everyone would be expected to accumulate a stock of capital more or less proportional to his or her wage level in order to maintain approximately the same standard of living (or the same proportion thereof) after retirement [245].

This inference from the life-cycle hypothesis is correct only if it refers to the level of wealth and the level of income on the day of retirement. However the evidence that demonstrates that wealth inequality is greater than income inequality refers to the population as whole, not just for individuals on the cusp of retirement. Actually, even when labor income is evenly distributed, the hypothesis implies a considerable *inequality* of wealth. Look ahead to Figure 3 (on page 20), what Piketty calls the “Modigliani Triangle.” In that familiar schematic the wealth-income ratio at the age when the individual enters the labor force is zero. As the person grows older, his or her savings accumulate and thus household wealth rises until the day of retirement when it would reach a peak. Thereafter wealth falls as it is drawn upon to finance consumption in retirement. At death it would be zero (under Modigliani’s simplifying assumption of perfect foresight).¹⁴

¹⁴ Figure 3 should be thought of as a preparatory drawing for the finished picture – a “cartoon.” Modigliani called it the “stripped down version” of the life-cycle hypothesis [Modigliani 1986: 300]. There are several rather unrealistic assumptions made to simplify this schematic illustration of the life-cycle model. For example, both the life span, L,

For the purpose of a back-of-the-envelope calculation, Modigliani set the earning span at 40 years and the years of retirement at 10 years. Those numbers put the wealth-income ratio equal to 8 on the day of retirement.¹⁵ For the sake of illustration, assume that there is *no wage inequality* – every worker is paid an identical wage at each year – and also assume that there are the same number of individuals at every age. Aggregate wealth in Modigliani’s stationary society would come to five times annual income [Modigliani 1966: 165-166]. Even in this highly-stylized world, the top 10 percent of the wealth distribution would hold 19 percent of the wealth. The bottom 20 percent would hold only 4 percent of the wealth. The inequality of wealth in this equalitarian setting is striking. When the rigid assumptions of the schematic model are relaxed, particularly the assumption of a perfectly egalitarian distribution of income, the assumption of foreknowledge about the age of death, and the assumption that assets earn no income, it becomes even more evident that the greater concentration of wealth than labor income is consistent with life-cycle characterization of saving behavior.

The life-cycle model as presented by Modigliani is a characterization of the saving behavior of workers, people who earn income from labor and from the interest on their accumulated wealth. For Piketty, however, the center of attention, his *cynosure*, is the wealth held by the super-wealthy one-percenters and by the very-wealthy who occupy the top decile. In recent decades the share for the top 10 percent has been around 70 to 75 percent [Piketty 2014: Figure 10.5, p. 348] and, as I noted, Stiglitz has suggested that the share owned by the top 1 percent is near 40 percent. While labor incomes are also very concentrated in the hands of a few (think CEO salaries), it is quite possible that the life-cycle story cannot fully explain all of the

and the date of non-employment, N , must be known with certainty from the outset for the individual to precisely exhaust his or her life-time income with a constant level of consumption.

¹⁵ In Figure 3 annual income is \bar{Y} , the length of life after entering the labor force is L , and the length of the working life is N . Wealth, $A(t)$, grows until year N when it reaches $(L-N) \cdot (N/L) \cdot \bar{Y}$.

wealth at the top.¹⁶ If so, Piketty is right to look for a motive beyond the life cycle to hold wealth. My complaint is that he considered only one alternative, the bequest motive.

I propose that in addition to life-cycle and bequest motivations for holding wealth there is an “entrepreneurial motive.” The owner of or partner in a business, the “entrepreneur,” will consider the value of that business as part of household wealth yet he or she may feel that it is essential to maintain the business intact. The annual income received either as salary or dividends could be consumed or saved as desired, but the wealth tied up in the business cannot be redirected without harming the on-going concern. If the owner intends never to sell, then he or she would have no reason to save for retirement. If the owner chooses to sell at some point, then the household can live off the proceeds. So again there would be no reason to save. These entrepreneurs would be characterized by Greg Kaplan, Giovanni Violante, and Justin Weidner as “wealthy hand-to-mouth.” These households hold little or no liquid wealth despite owning sizable amounts of illiquid assets. Kaplan, Violante, and Weidner estimate that approximately twenty percent of current U.S. households can be described as wealthy hand-to-mouth and that the “frequency of wealthy hand-to-mouth status has a hump-shaped age profile that peaks in the early forties” [Kaplan, Violante, and Weidner 2014: 47]. Thus some entrepreneurs sell their businesses and live off the proceeds. At the owner’s death or at the time of the sale, the business survives. Businesses don’t leave bequests.

I will suggest in this paper, the entrepreneurial motive for holding wealth has relevance for the Gilded Age. The concentration of business, industrial and commercial, in the hands of a

¹⁶ Yet, it is possible that it could. In recent years the income share of the top 10 percent in the U.S. ranged between 45 and 50 percent while the wealth share of the top 10 percent ranged from 70 to 75 [Piketty 2014: Figure 8.5, p. 291; Figure 10.5, p. 348]. In a simulation, the stylized and over-simplified life-cycle model suggests that if the incomes of the top 10 percent were distributed equally among the members of that elite group and they saved only for life-cycle reasons (that assumes that they planned to retire), an income share for them of 45 to 50 percent generates a wealth distribution where they hold 68 to 76 percent of total wealth. Apparently a good fit to the data. Note, however, that members of the top decile of the income distribution are not necessarily members of the top of the wealth distribution as my simulation assumed.

few direct owners was a frequent explanation for the large fortunes reported during the Gilded Age.

The nineteenth century is the appropriate place to test Piketty's assumption about the importance of the bequest motive. He argues that the "laws of capitalism" are currently at work to return the economy to a new Gilded Age. He draws inspiration for focusing on bequests from eighteenth- and nineteenth-century sources (mostly European novelists) and from the concerns about the threat of inequality expressed at the close of the era by the Yale economist Irving Fisher [Fisher 1919, Piketty 2014: 506].¹⁷

What is Wealth?

Piketty created some confusion, evident in the outpouring of commentary and criticism flooding the blogosphere, about the definition of wealth and the dangers of its overconcentration with the title of his book. "Capital," as defined by Piketty, is not the reproducible tangible capital that contributes to the production of output, the argument **K** in the economist's production function. Rather Piketty defines capital as marketable wealth at current market prices [Field 2014]. This includes currency, government bonds, business capital (i.e. **K**), intellectual property (patents, copyrights), residential structures, cropland, undeveloped land, livestock, and (in the United States before emancipation) slaves. He excludes consumer durables (automobiles, household appliances, furniture, and the like), but includes valuables (works of art, jewelry, gold and silver) [Piketty 2014: 179-180]. Marketable wealth excludes the capitalized value of future pension benefits and human capital. Piketty's focus is on *marketable* wealth, because only marketable wealth can be passed onto heirs.

¹⁷ While Fischer thought that the growing presence of enormous fortunes were dangerous to democracy and social harmony, did not believe that inheritance was the source of the problem.

The ordinary millionaire capitalist about to leave this world forever cares less about what becomes of the fortune he leaves behind than we have been accustomed to assume. Contrary to a common opinion, he did not lay it up, at least not beyond a certain point, because of any wish to leave it to others. His accumulating motives were rather those of power, of self-expression, of hunting big game [Fisher 1919: 12].

Wealth is a legacy of the past. In essence it comes in three elemental forms. Natural resources, primarily land and the minerals and water that come with land, constitute the primary form of wealth. Land has value because its owner may claim rent from whoever uses the land to grow crops or site a building. Our society has adopted rules by which ownership of land is established and has created procedures to recognize and record the history of ownership.

The second form of wealth consists of tangible things that are durable. This wealth was manufactured sometime in the past when labor, land, and capital cooperatively produced such things as buildings, machines, and Picasso's oil paintings. Society values these durables and assigns them to owners using accepted rules. Sometimes individuals own these items directly as is typical with owner-occupied homes, jewelry, and works of art. More often people own durable wealth indirectly by holding an intermediary asset such as stock in a corporation that owns the buildings and the machines.

A third type of wealth is intangible. Intangible assets come in two flavors. First, there is what we might call "artificial land." These are monopoly rights created by society to claim a flow of rent in the future. One example of a land-like form of intangible wealth is a patent on a specific technology. The patent is a legal right to reap a stream of income, "pure rents" in the economist's jargon, generated by the exclusive right to use that specific technology in the future. All forms of marketable intellectual property such as copyrights and transferable sources of commercial advantage such as trademarks and brand names would also count as artificial land. The other form of intangible wealth includes such future claims as the right to receive a pension in retirement, as stock options that can be executed at some point in the future, as a time share on a ski cabin, and as a promissory note signed by your brother. While this type of intangible wealth is valuable to the individual owner, it disappears in the aggregate. Each such asset is counterbalanced by an equivalent liability assigned to someone else. Your brother's promissory note is part of your wealth but for your brother it is a debt that cancels out some of his wealth. The pension you have been promised is offset by the liability of the entity that owes you. If what interests us is marketable wealth *in the aggregate*, we need only to concentrate on net worth. But once we take an interest in the distribution of wealth (and this is what interests Piketty),

cannot be ignored. It is certainly possible to imagine a wealthy class of individuals with claims on future incomes.

While wealth is a product of the past, it gives its owner power over the future. If society recognizes your ownership of some form of wealth, you can trade that away to obtain non-durable things like food or services like yard work from a gardener or advice from a lawyer. Wealth gives you the power to consume more than you currently earn. Wealth with proper management can also be a source of income. Many assets earn a return, which takes the form of interest, or dividends, or capital gains. It is up to the owner of these income-earning assets to manage her wealth and to decide whether and how much to save of the income generated just as it is up to wage earner to decide how much of each paycheck to save.

Motives for Saving

The life-cycle insight might seem both simple and obvious, but before the 1950s economists and philosophers had a different view of the motivations for saving. Even John Maynard Keynes, the great macroeconomist of the twentieth century, found it difficult to explain the motivation for saving. One theme of Keynes' *General Theory* is that saving is a residual; it is what is left of income after paying taxes and consuming. For Keynes the key question was what determined consumption and investment, which in turn would determine income. If we knew income and consumption, the magnitude of savings would follow [1936: 63]. Keynes proposed a “fundamental psychological law” of consumption, “upon which we are entitled to depend with great confidence both *a priori* from our knowledge of human nature and from detailed facts of experience” [Keynes 1936: 96]. “The psychology of the community is such that when the aggregate real income is increased aggregate consumption is increased, but not so much as income” [p. 27]. This “consumption function” turned out to be one of the weakest parts of the Keynesian edifice, as Modigliani and Brumberg's Life-Cycle Hypothesis demonstrated.

One problem was that Keynes' proposition was about the total consumption of a *community*, not a descriptive theory that characterized individual motives for saving. Nevertheless Keynes briefly acknowledged the difference between his macroeconomic model of consumption and a behavioral description of saving. He listed eight subjective incentives which

lead individuals to refrain from spending. “Since, however, the analysis of these factors raises no point of novelty, it may be sufficient if we give a catalog of the more important, without enlarging on them at any length.” Here is his list, I quote:

- (i) To build up a reserve against unforeseen contingencies;
- (ii) To provide for an anticipated future relation between the income and the needs of the individual or his family different from that which exists in the present, as, for example, in relation to old age, family education, or the maintenance of dependents;
- (iii) To enjoy interest and appreciation, *i.e.* because a larger real consumption at a later date is preferred to a smaller immediate consumption;
- (iv) To enjoy a gradually increasing expenditure, since it gratifies a common instinct to look forward to a gradually improving standard of life rather than the contrary, even though the capacity for enjoyment may be diminishing;
- (v) To enjoy a sense of independence and the power to do things, though without a clear idea or definite intention of specific action;
- (vi) To secure a *masse de manoeuvre* [strategic reserves] to carry out speculative or business projects;
- (vii) To bequeath a fortune;
- (viii) To satisfy pure miserliness, *i.e.* unreasonable but insistent inhibitions against acts of expenditure as such [Keynes 1936: 107-109].

Keynes labeled the first of these motives “Precaution” and the second “Foresight.” These are the two motives that animate the life-cycle model. And he noted that the positive motive to saving described by these two motives has an “intended counterpart in negative saving at a later date, as, for example, with saving to provide for family needs or old age” [1936: 109]. The third and fourth motives, “Calculation” and “Improvement,” together describe what Irving Fisher called “patience” and which he put as the primary explanation for accumulating wealth. These two motives, which Fisher predicated on a now-discredited theory of biological inheritance, hold little attraction for modern economists studying saving [Fisher 1912: 478-481].

“Avarice,” the eighth goal, while sometimes encountered, is now thought by most economists (and psychiatrists) to be rare, symptomatic of ‘irrationality,’ and a mental illness (compulsive hoarding disorder) requiring “intensive treatment” [Mayo Clinic 2014]. Keynes would agree:

The love of money as a possession – as distinguished from the love of money as a means to the enjoyments and realities of life – will be recognised for what it is, a somewhat disgusting morbidity, one of those semi-criminal, semi-pathological propensities which one hands over with a shudder to the specialists in mental disease. [Keynes 1930: 369]

Number 7 in Keynes list, which I just skipped over temporarily, is what is usually labeled a “bequest” motive or a “dynastic” impulse. Keynes called it “Pride.” According to Piketty this motive, relabeled as altruism, is the primary source of wealth held by Americans today – the desire to “bequeath a fortune.” The simple version of the life-cycle model ignores this as a factor and the richer, augmented version minimizes it.

Keynes’ failure to integrate his list of subjective behavioral motives into his macroeconomic model has been a common complaint of his critics. The “fundamental psychological law” that both consumption and saving would rise with income led many to think that saving should be regarded as a luxury good that would be “purchased” in greater quantities by the rich than poor in order to “bequeath a fortune.” That idea didn’t resonate with Modigliani. “This explanation satisfied me not a jot” [Modigliani 2001: 52].

Quantitatively distinguishing between the two views is quite difficult given the scope and quality of data available. This will become evident when I discuss the distribution of wealth in the nineteenth century United States in Part II and address the issue of the proportion of wealth that is inherited in Part III. But first it may prove helpful to review the worker surveys. That will provide a sense of their reliability and the evidentiary basis for concluding that saving in the nineteenth century was primarily motivated by life-cycle considerations.

Part I: Saving in the Gilded Age

The aim of every normal man and woman is an old age free from care and want. To that end most of them toil patiently and live closely, seeking to save something against the day when they can earn no more.

Congressman Victor L. Berger (SDP-Wisconsin)
introducing a bill to provide old age pensions in the
62nd Congress, 1st Session, August 7, 1911.¹⁸

Congressman Berger, speaking in 1911, suggested that most Americans engaged in saving during their prime earning years to “gain a competence” with which to finance consumption later in life.¹⁹ “Life-cycle saving,” as understood by economists, refers to the propensity to save generated by the anticipated decline of income over the later part of the life course and a planned (or forced) retirement in late life. The strategy is to accumulate assets to be used to maintain consumption in old age. In the nineteenth century the motivation for life-cycle saving was not so much a planned retirement, but protection from the risks that Congressman Berger also alluded to in his speech to Congress:

In the life of the toiler there are weeks, and sometimes months, of enforced idleness, weeks of unavoidable illness, losses from cheating and swindling, and then, as age creeps on, from about his forty-fifty year, a constantly declining capacity to earn ...

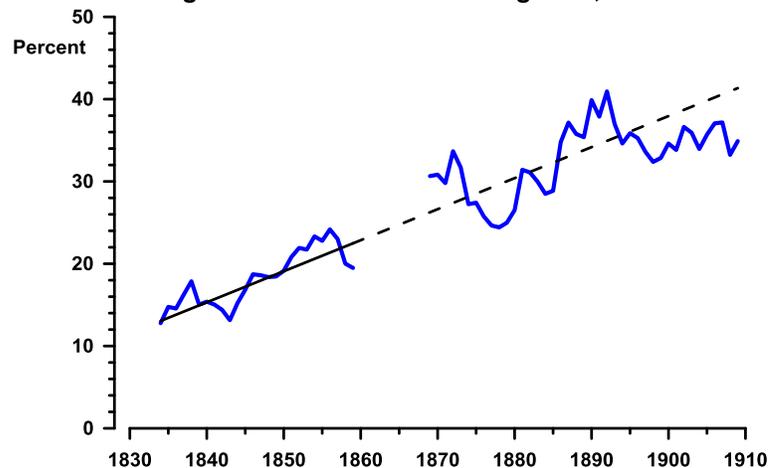
In this Part of the paper I will demonstrate that these concerns were ubiquitous among the working class in the latter half of the nineteenth century and, because familial and government support was inadequate, saving was common and saving rates were by high.

¹⁸ *Congressional Record*, Volume 47, Number 101, page 3913, reprinted in Berger [1929: 639].

¹⁹ Berger was a founder of the Social Democratic Party of America and the first socialist elected to Congress [Gordon 1941]. His proposed remedy for the problems faced by the elderly was a federal pension system for everyone over the age of sixty who were citizens for at least 16 years (and not convicted felons). This would be paid from current tax revenues. His bill failed to pass [Miller 1973: 82-83]. Of course, twenty-four years later his vision became federal law with the passage of the Social Security Act. Berger’s act would have set the retirement age at 61; the Social Security Act set the standard retirement age at 65.

At the aggregate level we know that gross private saving rose over the course of the nineteenth century. By the end of the century this measure exceeded 30 percent of gross national product. **Figure 1** plots the time series and indicates that there was a steady increase in the saving rate from the mid-1830s to the 1890s.²⁰ I suggest that the

Figure 1. Gross Private Saving Rate, 1834-1909



underlying reason for this rise was the gradual spread of life-cycle motives to save and invest as industrial employment and urban living became increasingly common.²¹ Roger Ransom and I suggested that during the nineteenth century there occurred a gradual transition away from a pre-modern family-based set of institutions which featured patriarchy, dynastic inheritance, high fertility, and grown-children's responsibility for their aging parents to a new set of institutions based on individual responsibility, reduced fertility, saving, and self-financed support in old age [Ransom and Sutch 1986, Sutch 1991, and Sutch 2006: Volume 3, 291-293].

This transition links two great trends evident in nineteenth-century American economic development, the continuous decline in fertility and the dramatic rise in the rate of saving. As young couples increasingly turned to saving in order to secure their old age, the demand for assets increased and the demand for children fell. In a sense, *society* gradually substituted bank accounts for babies, financial accumulations for large families, and self-reliance for community

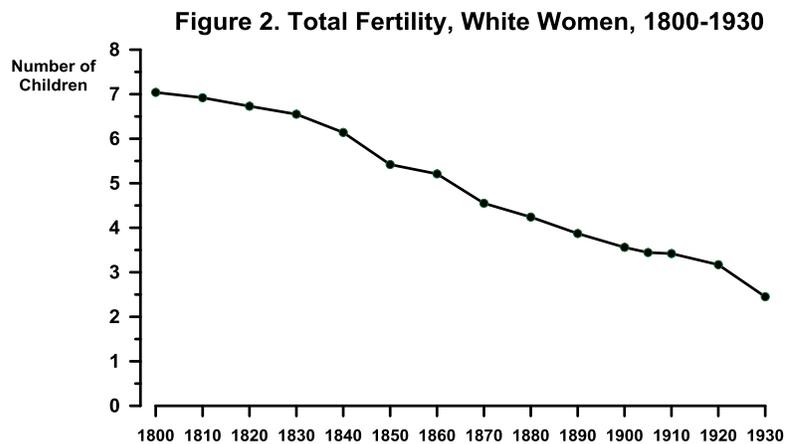
²⁰ Gross private saving includes investment in housing and consumer durables. For the years before the Civil War, 1834-1859, saving also includes the increase in the value of slaves. The original underlying estimates were made by Robert Gallman [1960]. These were revised by Paul Rhode [2002: Table 1] and Rhode and Sutch [2006: Table Ca219-232 and Table Ca233-240]. For the years following the Civil War, 1869-1909, the underlying estimates were also made by Robert Gallman [1966]. These were revised by Rhode [2002: Tables 2 and 3] and reproduced in Rhode and Sutch [2006: Table Ca192-207]. For more details see the documentation accompanying these tables and my discussion [Sutch 2006: 291-293]. There are no estimates spanning the decade of the Civil War. The solid straight line is a trend fitted to the antebellum data. The dashed line extrapolates that trend into the postwar years.

²¹ In a companion paper [Sutch 2015] I discuss the beginnings of life-cycle saving following the War of 1812.

altruism and intergenerational reciprocity.²² Over the century the life-cycle strategy became the dominant method of providing for old-age security. Initially my coauthors and I tracked the spread of life-cycle institutions by mapping and charting the national fertility decline [Carter, Ransom, and Sutch 2004; also see Steckel 1992; and Haines, Jarmski, and Hacker 2014]. That effort suggested that the life-cycle transition was well underway by the 1860s and had reached all parts of the country outside of the slave South. Thus it would not be surprising to discover that a majority of industrial workers were heavy savers in the latter part of the century.

Figure 2 displays a time series on the total fertility of white women.²³ These data imply that in 1800 the average American woman would have given birth to seven children by the end of her reproductive period.

Because some women never marry and others are infertile or develop secondary infertility, seven children per women is a number close to the biological maximum for a large and heterogeneous population such as characterized the United States in 1800. From this high level, the series shows a continuous decline for the next 130 years.



²² I stress the point that it is society making this substitution, since established families typically could not easily switch between the two strategies.

²³ Figure 2 is based on Susan Carter *et al.* [2006: Figure Pa-C, p. 12, and Series Ab63]. The estimates are originally from Ansley Coale and Melvin Zelnik [1963: 36]. Total fertility is an age-adjusted rate. The number for each year is calculated assuming a hypothetical group of one-thousand women have the same birth rate at each age as was observed in the cross section of women that year. If so, these women would collectively have a certain number of children by the time they reached the end of their reproductive period. The total fertility rate is usually expressed per 1,000 women. By dividing the total fertility rate by 1,000 the chart offers an estimate of the number of children that would be born to a woman in her lifetime assuming she survived to the end of the child-bearing period.

1.1 The Life-Cycle Hypothesis

Save it when you need it least, have it when you need it most.

-- Franco Modigliani 1985²⁴

It may be helpful at this point to step back and briefly review the logic of the life-cycle hypothesis. That will focus attention on the patterns of saving and wealth that are thought to be indicators of life-cycle saving and to distinguish that motive from alternative ones. **Figure 3** reproduces a diagram employed by Franco Modigliani to articulate the life-cycle hypothesis of saving. The diagram, first published in his famous article in *Social Research* in 1966, represents a stylized temporal profile of income and consumption for an individual who enters the labor force at time zero and lives for L years. The diagram illustrates a case with labor income

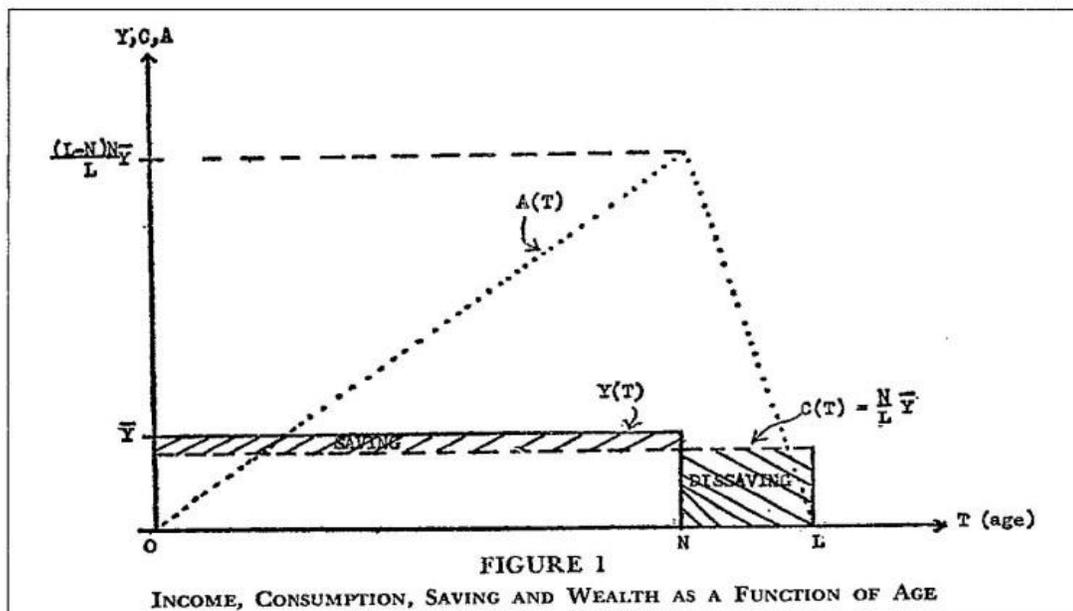


Figure 3. The “trademark” of the life-cycle hypothesis of saving

²⁴ As quoted in the *Boston Globe* [Warsh 1985: A1]. According to the *Chicago Tribune*, Modigliani claimed that the life-cycle hypothesis was inspired by an old advertising slogan from a savings bank [Goodman 1985]. The only newspaper ad I was able to locate with this slogan was placed by the City Savings Bank of Pittsfield, Massachusetts in the *Berkshire Eagle* on February 27, 1952: “SAVE MONEY when you need it least. HAVE MONEY when you need it most. Latest dividend 2 ½ % a year.”

constant at \bar{Y} for N years and zero thereafter. Consumption is also assumed to be constant over the individual's entire life. This simplified version of the life-cycle hypothesis assumes that the individual will choose to exhaust his or her total life-time income through consumption. To accomplish this goal the constant level of consumption must be $(N\bar{Y})/L$ and the rate of saving while working will be equal to $1-(N/L)$. The savings are invested in asset holdings, $A(t)$, which rise from zero at the outset to a peak magnitude at year N just sufficient to finance consumption for the final $L-N$ years of life, when the worker is assumed to be without employment either because of voluntary retirement or involuntary unemployment or disability. In retirement the assets are "dissaved" and eventually drawn down to zero at the predetermined time of death. The individual's wealth profile would exhibit a triangular shape. Modigliani labeled this diagram with its hump-shaped asset profile the "trademark" of the life-cycle hypothesis [Modigliani 2001: 300].²⁵

There are several rather unrealistic assumptions made to simplify this schematic illustration; Modigliani called it the "stripped down version" [1986: 39]. For example, both the life span, L , and the date of non-employment, N , must be known with certainty from the outset for the individual to precisely exhaust his or her life-time income with a constant level of consumption. The level of labor income must also be known in advance. Assets earn no income because interest rates and capital gains are presumed (for simplicity) to be zero. However, these assumptions can be relaxed without damage to the core idea that the primary reason for saving is to amass wealth to finance late-life consumption. Since the date of death is uncertain, the prudent individual who wishes to avoid becoming dependent on grown children, public welfare, or charity will consume and save as if he or she might live to a "ripe old age." Since most individuals do not live so long, many will die leaving an "unintended bequest" to their heirs

²⁵ If I might brag a bit, I was Franco's graduate student research assistant at the time he prepared the *Social Research* paper for publication. I drafted the diagram reproduced here [Modigliani 1966: 165]. It was also included in Modigliani's Nobel Prize lecture [1986]. For a brief assessment of Modigliani's contributions to economics see Sutch [2009].

[Hurd 2002, 2003]. Thus the life-cycle hypothesis is consistent with the observation that many people die with a substantial positive estate.²⁶

The model represented in Figure 3 considers an individual who earns an income through labor and who contrives on net to save nothing on net over his life. The dissaving at the end of life cancels the saving during the working years. Assets, from the perspective of this worker, are an inventory of purchasing power that enables him or her to maintain a fairly stable rate of consumption in the face of variations in income, the most significant of which is the disappearance of income upon leaving employment. The fact that assets often generate income doesn't really change the picture. The typical worker will invest the savings in fixed income securities (interest bearing accounts, bonds), in equities, or in real estate. The asset income generated will contribute to the value of the portfolio and reduce the amount of saving from labor income that would be required to achieve the asset target that permits exiting employment. Thus unexpectedly high returns (e.g., high real interest rates) will tend to reduce the savings rate. This effect will be offset by the incentive to save more which a temporarily high rates of return would generate. Modigliani thought that the two effects would roughly cancel and that saving would be largely independent of the rate of interest [1986: 304].

The idea that life-cycle behavior was common at the end of the nineteenth century has been contested. Michael Darby, noting the high saving rate at the turn of the century (see Figure 1), suggested that the incentive to save at those rates could not have been generated by a life-cycle motive because retirement was, he thought, not very common at the time. Moreover, the presumed increase in the incidence and average length of retirement between 1890 and 1930 should, he argued, have increased life-cycle saving, but Darby could find no evidence of an upward trend in saving rates during this period. He concluded that this “appears to show that

²⁶ Since these estates are passed on to the younger generation, many individuals will inherit some wealth in midlife. That windfall should reduce their rate of saving from labor income or hasten the day of their retirement.

life-cycle motivations are a much less important source of aggregate saving than most persons have thought” [1979: 22-28, quotation on page 27].²⁷

I believe that that Darby’s conclusion rests upon a misunderstanding of the historical record. The obsolete data that Darby relied upon for the level and trend in retirement rates is misleading. He cites gainful occupation rates.²⁸ The Census Bureau’s concept of gainful occupation is not the same as employment and is different from the modern concept of labor force participation, which was not introduced until the late 1930s. As the Census Bureau noted:

The gainful worker concept differs radically from current labor force concepts ... [T]he term “gainful workers” includes all persons who usually followed a gainful occupation although they may not have been employed when the census was taken. ... The question as posed by the enumerator made no reference to time. The response thus varied substantially with the individual. Many persons who were retired or permanently disabled and who had not worked for some time reported their former line of work and were counted as gainful workers [U.S. Bureau of the Census 1975: 124].²⁹

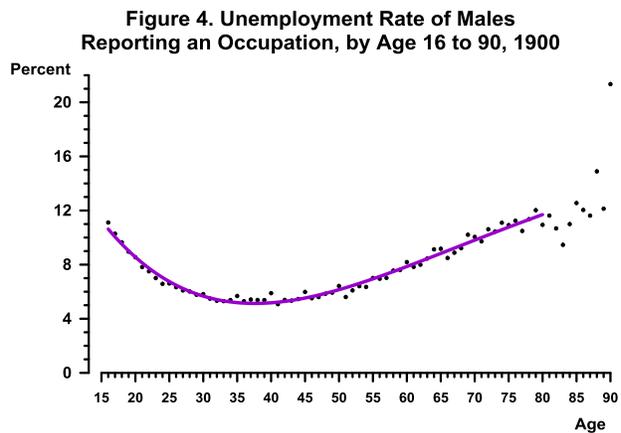
Thus many non-employed individuals were reported as having an occupation simply because they had accumulated life-cycle savings.

²⁷ In her history of retirement Dora Costa makes the related claim that “among men older than sixty-four, [labor force] participation rates fell steadily, from 78 percent in 1880 to 65 percent in 1900 [and to 58 percent in 1930]” [Costa 1998: 7]. Other skeptics include Jon Moen [1994], Chulhee Lee [1998 and 2001], and Joanna Short [2002].

²⁸ Darby [1979: table 3.1] cites Clarence Long [1958: table A-2] as his source and Long uses the census data on gainful workers with only minor adjustments [1958: appendix F]. Long apparently felt that the gainful occupations data excluded the retired and disabled, but they do not [p. 406].

²⁹ The inclusion of older non-employed individuals was also acknowledged in the reports of the 1900 and 1940 censuses [U.S. Census 1900, Occupations, pp. ccxxv and ccxxxiii; and Durand and Goldfield 1944: 197-198]. Also see Susan Carter and Sutch [1996 *Historical Methods*] for a specific discussion of the census returns for 1870 and 1880 which are more problematic.

Perhaps more important than this misclassification, the census records from 1880 and 1900 suggest that many older men who reported a gainful occupation experienced long spells of unemployment. **Figure 4** presents the age profile of the unemployment rate for men based on the returns of the census in 1900.³⁰



The hazard of unemployment began to rise after men reached their mid-40s. It is evident

that older men experienced a greater incidence of enforced idleness the older they were. Robert Margo has presented evidence from the 1900 census that long-term unemployment

enhanced the probability that an elderly person would leave the labor force in the near future. But in this respect, long-term unemployment was no different from many other factors (for example, poor health) that might have hastened the subsequent retirement of persons ... [Margo 1993: 421].

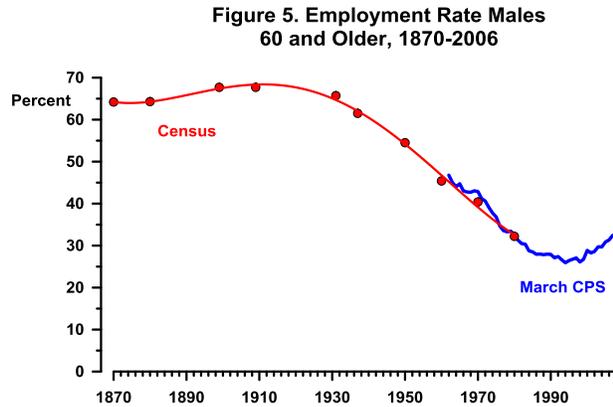
Gainful occupation statistics do not provide a reliable guide to the trend of employment for older men. Ransom and I reported that there was virtually no change in the employment rate of men, aged 60 and over, between 1870 and 1930 [Ransom and Sutch 1986: 6].³¹ **Figure 5** charts the trend for older men.³²

³⁰ The data used to calculate the series plotted in Figure 4 relies upon the 5-percent public-use sample of the enumerators' manuscripts from the 1900 census downloaded from the IPUMS-USA website [Ruggles et al 2010]. The 1900 census reported the number of months, out of the previous twelve, that a person who stated an occupation had been "unemployed." In 1900 the instructions to enumerators defined the unemployed as those "unable to secure work of any kind." The unemployment rate plotted was calculated by counting 1/12th of those who reported one month of unemployment in the previous year as unemployed (since the probability that such an individual would be unemployed in a given month would be one out of twelve), plus 1/6th of those who reported two months of unemployment, plus 1/4th who reported three months, and so on. This method of calculating unemployment from these census returns has been employed by Alexander Keyssar [1986: 357] and Robert Margo [1988: 328].

³¹ This conclusion was further supported and defended in Ransom and Sutch [1989], Ransom, Sutch, and Samuel Williamson [1991], and Susan Carter and Sutch [*Historical Methods*, 1996].

³² The data plotted in Figure 5 for 1870 and 1880 are from the published census returns. However, the data for those years are problematic. See Susan Carter and Sutch for a discussion [*Historical Methods*, 1996: 17]. The data points plotted for the census years 1900 through 1930 are based on the IPUMS files for those years and estimated with a consistent methodology to maximize the comparability of the four observation that span the period focused on by

The late nineteenth century surveys that I review in this paper canvassed only the families of individuals actually working at the time the survey was conducted. No retired individuals were included. So the dissaving phase of the life-cycle will be absent or muted. If wages are reduced or unemployment spells more frequent for older men, then saving may be reduced or halted, but a pronounced hump in the saving-age profile is not expected. What these data can reveal, however, is what proportion of working families were engaged in saving and what fraction were likely to become dependent upon grown children or community support in their old age. On a priori grounds, I expect that a significant fraction were saving primarily to satisfy precautionary and retirement motives, but that a minority were not. Those in the majority were life-cycle savers.



This paper examines several cross-section sources of data by age with information on household income, unemployment, and saving including some retrospective data which allow an examination of how circumstances and behavior changed for individual workers over time. These data sets are selected from a larger number collected by the University of California’s Historical Labor Statistics Project. The results presented here are based upon budget surveys taken at various dates between 1884 and 1899 in Kansas, Michigan, Wisconsin, and Maine by those state’s Bureaus of Labor. Each of these was a newly settled state just beginning the development of a manufacturing industry. If aggregate fertility rates are a reliable guide, the

Michael Darby. The figure for 1937 is extracted from the “Enumerative Check Census” conducted in 1937. The census data on labor force participation for 1940 are unreliable. For a discussion see Ransom and Sutch [1986: 12-13]. The census figures for other years are from Ransom and Sutch [1986: Table 2, p. 14]. The data from the March Current Population Surveys are extracted from the IPUMS-CPS files.

populations of these states were less advanced in adopting the life-cycle strategy than the workers from the industrial states of the East Coast.

1.2 Age Profiles of Industrial Workers' Income

According to Congressman Berger, “as age creeps on, from about his forty-fifth year, [the toiler faces] a constantly declining capacity to earn.” The surveys of workers’ incomes support his claim. Here I display the results from several different surveys that taken together included responses from over 40,000 workers with a wide variety of manufacturing and transportation occupations. I begin with a survey of workers in the agricultural implements industry and iron works in Michigan undertaken in 1890. The number of respondents was large, 8,837 in all, and the methodology of this survey was superior to some of the others. Moreover, the survey’s objectives and methods will serve as a general introduction to the other surveys to which I shall refer.

The Michigan survey was conducted by the State's Bureau of Labor and Industrial Statistics in 1890 [Michigan 1890]. It was the third of eight surveys aiming, in so far as possible, to contact the entire population of Michigan working in a given industry. The *Report* explains:

Twenty-five towns and cities were visited, and as many of the employés engaged in the above industries as could be seen, were canvassed. The result of the work does not show all of the workmen so employed, as under the most favorable circumstances it would be impossible to obtain every employé [p. xi].

The survey was conducted by the Bureau's staff. The *Report* boasted of the value of this method and argued that it resulted in the collection of highly reliable information:

The information embodied in this report was obtained, not by the blank system nor by special canvassers, but by the regular office employés of this bureau, who, in person, visited all of the shops and factories enumerated and secured directly from each workman the facts desired. This involved the asking of about fifty questions of each employé canvassed. The work has been done in the most thorough and systematic manner. When necessary each question was fully explained to the men, so that an honest and intelligent reply might be given [p. xi].

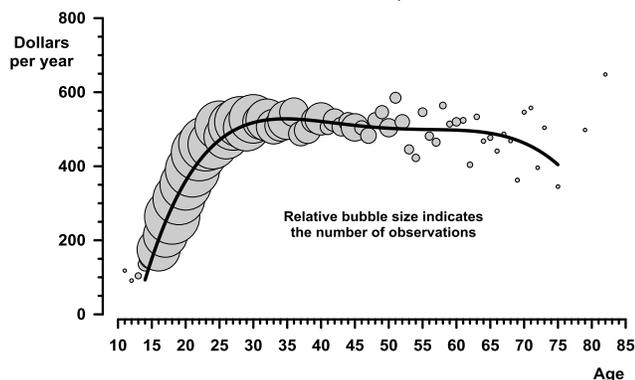
The *Report* also commented on the favorable reception given to its agents by the workers and employers it canvassed.

The workmen are beginning to understand the objects of the bureau, and, with but few exceptions, have willingly answered all questions asked, and frequently expressed a desire to aid in the work. The employers, too, have extended every courtesy to our canvassers, and the opposition formerly encountered through ignorance of the real purposes of the bureau has been overcome [p. xi].

Amazingly, the Bureau published *in full* the responses of all 8,837 respondents in its *Annual Report* for 1890. The Historical Labor Statistics Project coded the data into machine-readable format [Carter, Ransom, Sutch, and Zhao, MI08A and MI08B, 1993].³³

The survey covered 230 distinct occupations. **Table 1** lists separately the 14 most commonly-stated occupations. In all but two (painter and molder) median annual earnings for men 60 and older were less than the earnings for men 45-59. The median earnings for all men 60 and older in the agricultural implements and iron industries was \$480 while that for men aged 45-59 was \$30 higher, \$510. **Figure 6** plots the median annual earnings by age for the cross section of all 8,837 workers. The size of each bubble plotted reflects the relative number of respondents at each age. In the figure a polynomial has been used to smooth the data. The polynomial reaches its maximum level of earnings at age 34 and slowly declines as the age increases further, although there are actually very few workers beyond the age of 60. This cross-section would not likely reflect the time path of earnings of a typical worker as he aged, yet it is not preposterous to claim that a young man in Michigan in 1890 starting out in this industry

**Figure 6. Age Profile of Median Annual Earnings
Survey of Michigan Agricultural Implement
and Iron Workers, 1890**



could observe in some rough way this cross section and conclude that it would be prudent to anticipate stable income after age 35 and declining income and opportunities after age 65. A second survey from Michigan taken in 1895 reveals the same pattern of rising then slowly declining median incomes as the survey of agricultural implement and iron workers. This covered 1,200 street railway employees [Michigan

³³ These data sets are publically available for downloading from EH.NET.

1895; Carter, Ransom, Sutch, and Zhao, MI13C, 1993]. **Figure 7** presents the age profile of median earnings. Again there seem to have been few opportunities for older men in this industry, although perhaps that is because the street railways were a relatively new industry in 1895.

Four years later the Kansas Bureau of Labor and Industry published in its *Fifteenth Annual Report* the largest, most comprehensive survey of workers conducted by that agency by that time [Kansas 1899; Carter, Ransom, Sutch, and Zhao, KS15, 1993]. Though the Kansas Bureau had previously undertaken a number of worker surveys, this was the first since the passage of a law in 1898 reorganizing the Bureau and requiring that every "person, company or the proper officer of any corporation operating within the state" provide "full and complete answers ... returned under oath" to interrogations made by the Commissioner. Failure to comply was considered a misdemeanor, punishable by fine and/or imprisonment [Kansas 1899: 2]. The Bureau was to preserve the confidentiality of respondents. The Bureau felt that the change in organization allowed it to develop a closer degree of cooperation with wage-earners, citing "an improvement in the general responses to the inquiries of the department," and a "personal interest manifested in the work of the Bureau by wage-earners generally throughout the state." It concluded, "This relation has enabled the Bureau to present what we believe to be the most comprehensive chapter on wage-earner statistics that has been presented in this state" [p. 1]. The Bureau felt that the reports were "representative of the various railway, mechanical and miscellaneous trades, as well as representative from a geographical point of view" [p. 4]. **Figure 8** displays the age profile of the median annual wage earnings for 927 men. The decline in median income after age 37 is quite pronounced.

Figure 7. Age Profile of Median Annual Earnings Survey of Michigan Street Railway Employees, 1895

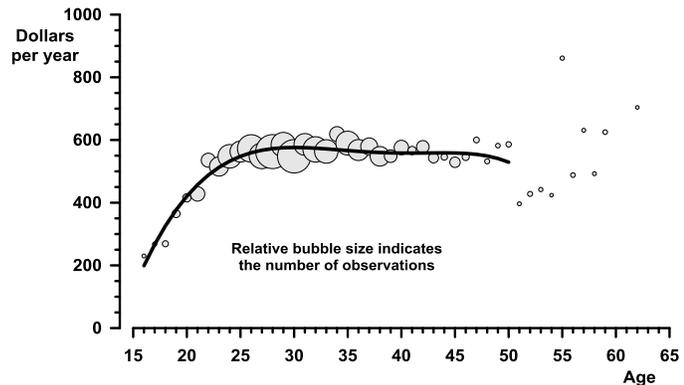
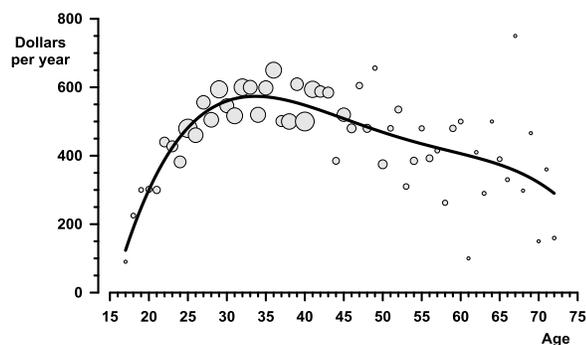


Figure 8. Age Profile of Median Annual Earnings from Wages Survey of Male Kansas Workers, 1899



The age profiles of total earnings from the three investigations reported here supplement the findings on annual earnings from eight other surveys from California, Maine, Kansas, Iowa, and Michigan reported by Ransom and Sutch [1995: Figure 11.3, p. 310]. These flat or declining age profiles of income are in contrast with modern age-earning profiles which typically show a continuously improving earnings picture as one scans from left to right and from younger to older ages. The explanation has three parts: (1: Hard Work) Laborers with physically demanding jobs began to lose strength, stamina, and dexterity as they aged. As a consequence their productivity began to fall. (2: Non-employment) Older employees at the end of the nineteenth century faced an increased hazard of unemployment and increasingly longer spells of unemployment as they aged. (3: Downward Mobility) Perhaps as a consequence of 1 and 2, many workers changed to less-demanding and more poorly-paid occupations in mid- to late-life.

1.2.1 Hard Work and Declining Productivity

As industrial workers aged beyond a point in their 40s or 50s their productivity began to decline. This is not surprising since many turn-of-the-century jobs required heavy exertion, stamina, and strength and in some cases agility, dexterity, and/or visual acuity. Hard labor was exacerbated by long hours. The typical workweek in manufacturing was 66, rather than 40, hours. In the industrial sector, machinery and the pace set by the machines meant that workers “must run with the machines,” as Edward Everett Hale pointed out in 1903.³⁴

If they are in a State where machinery runs eleven hours, they must work eleven hours. If they cannot work eleven hours, they cannot work at all. ... [T]here is now no place in our working order for old men – that is to say, for men who have passed what used to be called the “grand climacteric” [Hale 1903: 168-169].

Social historians citing a wide variety of anecdotal evidence suggest that industrial workers in the latter half of the nineteenth century exhausted their “industrial life” well before death [Fischer 1978: chapter 4; Achenbaum 1978: chapters 3 and 6; Graebner 1980: chapter 2;

³⁴ Hale was a well-known nineteenth-century Unitarian minister and author. He was 81 and the Chaplain of the U.S. Senate in 1903 [Adams 1977].

and Gratton 1986: chapter 3].³⁵ Quantitative evidence of this “exhaustion” from the nineteenth century is scarce, but a unique investigation into the duration of the “trade life” of working men was conducted in New Jersey between 1888 and 1900 by that state’s Bureau of Statistics of Labor and Industries [New Jersey 1889, 1890, 1891]. All together more than twelve thousand men over the age of 20 were surveyed in six industries. Each was asked “Have you begun to decline at your trade?” Using synthetic cohort techniques Ransom and I calculated that the typical age for the onset of decline would be in a man’s early 50s [1995: 312-316]. Since only men still working at their trade were included in the canvas this statistic excludes those who had already left the trade at the time of the survey. And thus the age of the “climacteric” so estimated is biased upward.

Workers who felt they were in decline reported the cause. Their responses are summarized in **Table 2**. In an era before environmental and workplace safety standards were in place, occupation-related illness and injury were common. The shaded cells indicate the leading cause of decline for each occupation. Note that mercury and lead poisoning were common among hatters and painters respectively. Mercury salts were used in finishing felt hats and the paints contained lead. One painter commented to the New Jersey investigators: “It is rare to meet an old painter who has not the evidence of disease stamped on his face” [New Jersey 1891: 176]. Loss of strength or energy was a prominent response of miners and carpenters. Stiffening of the joints (lack of dexterity) was a frequent complaint of bricklayers, masons, glass workers, carpenters, and plumbers. One plumber reported:

A plumber is rarely found who has worked at the trade for thirty years. They generally become rheumatic and stiff, or too feeble to do a full day’s work. They must be in full vigor, and after becoming stiff in the joints they are obliged to quit the trade [New Jersey 1891: 177].

Declining eyesight plagued printers. Plumbers reported high incidence of typhoid, the possible consequence of working with sewer pipes [Anonymous, “Typhoid Fever among Plumbers”

³⁵ The concept of an industrial life is from Lee Welling Squier [1912: 272].

1894]. “In repairing, there are more or less bad odors from which the workmen are liable to get sick” [New Jersey 1891: 177].

Workers in physically-demanding or health-impairing occupations could anticipate an early departure from those jobs and might prepare for that eventuality by saving more. There is evidence from the late-twentieth century and more recently that workers with highly-demanding jobs save more when working and then retire earlier than workers with jobs that do not make heavy demands [Filer and Petri 1988; Holden 1988; Li, Hurd, and Loughran 2008].

One might expect the decline in health, energy, and productivity indicated by the New Jersey survey to have been reflected in the wage rate paid. This was an era in American industrial history before job hierarchies, long-term contracts, and employee benefits (including pensions) were common. Thus workers might be expected to be paid a wage roughly equal to their on-the-job productivity. To some extent the worker surveys indicate a falling off of wage rates as age increased in the cross sections of low-skilled occupations, but the effect is small and mostly likely is poorly measured given the small number of older men who worked at these occupations. High-skilled occupations do not exhibit a decline in average wage rate with age. See **Table 3** for the averages for three occupations from Michigan’s agricultural implements industry and iron works in 1890.

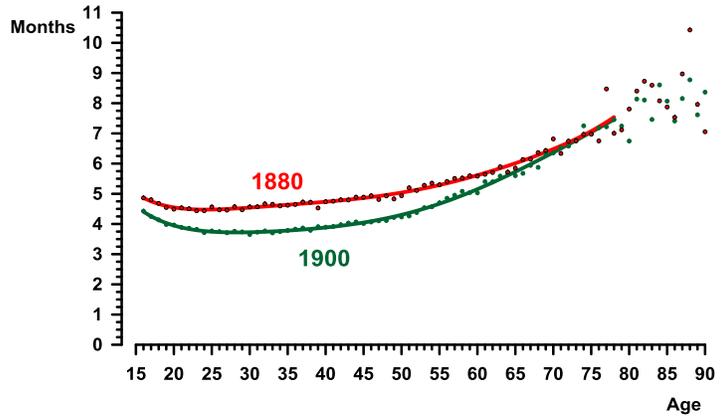
The explanation for this is that wage rates were often standardized. For example **Table 4** illustrates the distribution of wage rates reported by unskilled laborers 21 and over in the Michigan implements and iron sample. The wage rates paid were typically in round numbers divisible by fifty cents. A majority of these men were paid \$7.50, \$8.00, or \$9.00 per week. The typical wage of molders and machinists was \$12, \$14, or \$15 per week. The downward trend of *annual earnings* with age despite the stability of *wage rates* is explained by two other age-related phenomenon confronting the industrial work force: the increasing hazard of unemployment and downward occupational mobility.

1.2.2 Unemployment

Congressman Berger suggested that workers faced “weeks, and sometimes months, of enforced idleness.” Figure 4 on page 21 drawn from the IPUMS 5-percent sample of the 1900 census

suggests that the unemployment rate of older men was higher than for men in their prime working years. **Figure 9** reports of the number of months of unemployment in the previous year reported by those who did report unemployment.³⁶ I have tabulated this measure for both 1880 and 1900. Both censuses suggest that older men experienced longer spells of unemployment than their younger counterparts.

Figure 9. Average Number of Months of Unemployment in Previous 12 Months Reported by those who Experienced Any Non-Employment, Males 16 to 90, 1880 and 1900



This picture of increasing unemployment with age is also evident in **Figures 10 and 11** which display the average number of days lost during the year “from inability to obtain work” for those included in the Kansas surveys of workers, 1885-1887 [Kansas 1886, 1887, 1888; Carter,

Figure 10. Age Profile of Average Days Lost to Unemployment Survey of Kansas Workers, 1885-1887

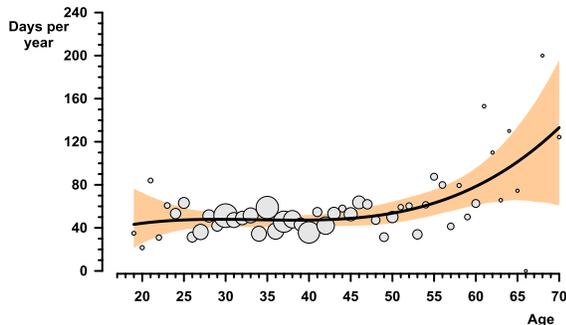
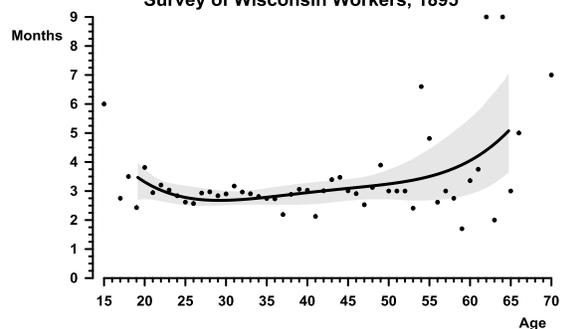


Figure 11. Age Profile of Average Number of Months Unemployed Survey of Wisconsin Workers, 1895



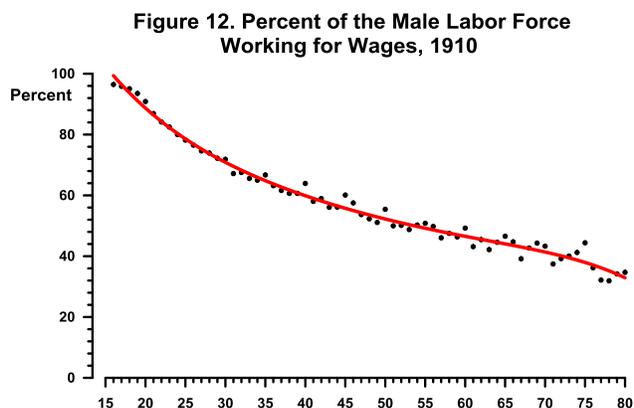
Ransom, Sutch, and Zhao 1993 KS1-3], and the survey of Wisconsin workers in 1895 [Kansas 1895; Carter, Ransom, Sutch, and Zhao 1993 WI107B].³⁷ We do not know if these reported

³⁶ Information on unemployment was also collected with the 1880 Census [U.S. Bureau of the Census, *Twenty Centuries*, 1978: 20]. However, the unemployment responses were not compiled or published. This fact and doubts about their reliability expressed in the 1900 census volumes suggest that unemployment rates were underestimated that year.

³⁷ Similar results were reported for surveys of Michigan’s stone and clay workers in 1888, manufacturing workers in Maine in 1890, and Michigan farm laborers in 1894 [Ransom and Sutch 1995: Figures 11.7 and 11.8].

spells of unemployment were due to temporary layoffs or due to extended job search when between employers. Job changes were frequent, so the increased difficulty that older men faced in finding new employment may account for the patterns of months and days lost by age. Why employers facing the necessity of layoffs should discriminate against older workers is not clear. If standardized wage rates prevented case-by-case adjustment of wages as an older worker's productivity began to decline, employers would have an incentive to lay off the older workers. Alternatively, employers may have favored younger men who had families to support and discriminated against older workers who had grown children or acquired assets they could rely upon for support during downturns.

Some occupations provided more security from unemployment, of course, than others. Self-employed workers including most farmers and professionals such as attorneys and medical doctors, by definition, cannot be involuntarily unemployed. However, they may experience crop



failures or periods of slack business.

Individuals who worked for wages could be laid off by their employer. In 1910 the census distinguished wage workers from employers and from the self-employed. At that date the proportion of workers who were working for wages steadily fell across the age spectrum.

Figure 12 displays the age profile of wage-earning status for males.³⁸ The decline in wageworkers as the age of the labor force participant increases is quite dramatic, reflecting both the greater persistence of the self-employed and the decision of some wage workers to switch to self-employment or to become an employer in late life. This gradient implies that the threat of unemployment for industrial workers is muted in Figure 9 by the changing composition of workers employment status. The average number of weeks of unemployment experienced by wage workers in the preceding year is displayed by age in **Figure 13**. No doubt some of this unemployment was predicable due to seasonality in such

³⁸ Excludes unpaid family farm workers (IPUMS variable occ1950 = 830).

occupations as outdoor construction workers, school teachers, fishermen, and lumbermen. The uneven flow of income from such anticipated unemployment can be smoothed over the year. Unanticipated unemployment shocks such as might occur during an economic downturn or in the wake of business failure

would require the household to rely upon their assets accumulated to satisfy retirement and precautionary motives until work returned. As emphasized by the life-cycle hypothesis, saving out of transitory income should be high and dissaving out of assets would be the response to negative shocks.

1.2.3 Downward Mobility

Ransom and I reported evidence that many men moved down the occupational ladder from a skilled industrial job to a less-demanding, but less rewarding, occupation [Ransom and Sutch, *JEH*, 1986: 19-24; 1995: 308-309]. **Figure 14** illustrates how frequently workers changed employers. This chart is derived from the reports of workers in Michigan's furniture industry. This deskilling reduced incomes even as wage rates in any given occupation did not change much with age. **Figure 15**

examines the responses of the Michigan street rail workers to the question "Have [your] wages increased or decreased in the past five years?" Plotted by age of the respondent, the proportion of responses indicating a decline rises sharply with age after about age 43. The proportion that

Figure 13. Number of Weeks of Unemployment Last Year Male Wage Workers, 1910

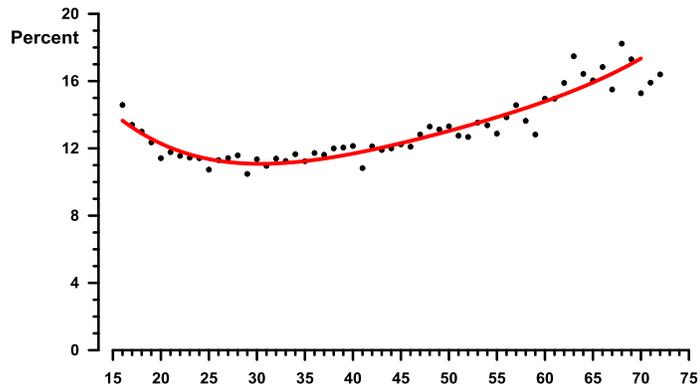
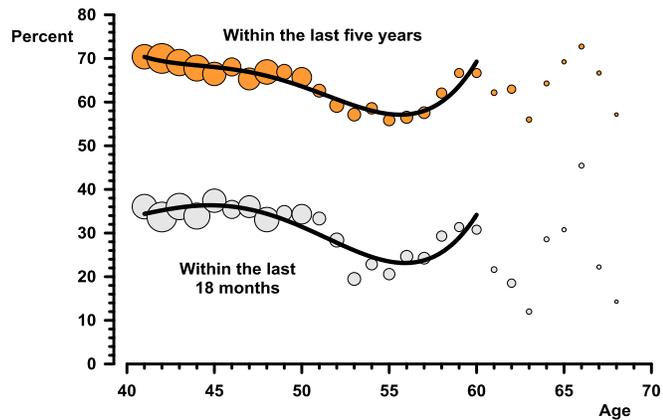
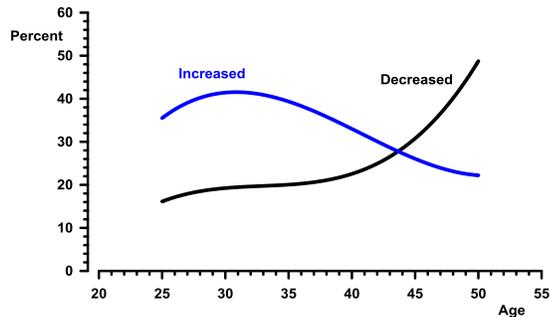


Figure 14. Percent of Workers who have Recently Changed Employers Michigan, Furniture Industry, 1889



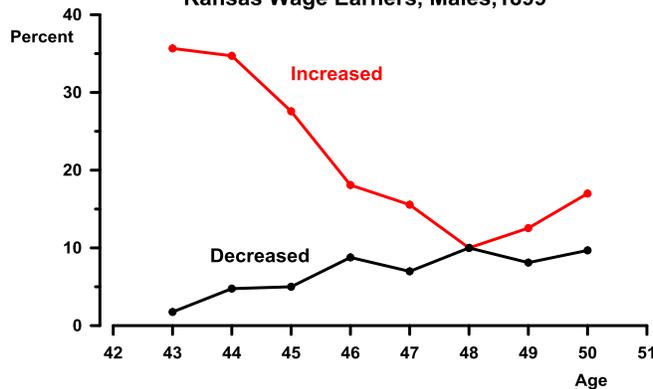
reported an increase falls.³⁹ This report mirrors the responses to a similar question put to Michigan's stone and clay workers in 1888 and to that states' railroad employees in 1893 [Ransom and Sutch 1995: Figures 11.4 and 11.5].⁴⁰ Older workers were more likely than younger workers to report declines in wages and less likely to report improvements in good times or bad.

Figure 15.
"Have wages increased or decreased over the past five years?"
Michigan Street Railway Workers, 1895



There was a significant increase in the wages of manufacturing production workers between 1898 and 1899. According to Lawrence Officer's estimates there was a 2.4 percent increase in the average hourly compensation [Officer 2009: table 7.1]. In Kansas the worker

Figure 16.
"Wages compared with last year [1898]?"
Kansas Wage Earners, Males, 1899



survey taken in 1899 reflected this improvement. Only 10.5 percent of men reported earning a lower wage in that year as compared with the previous year, 44.3 percent reported an increase, and 45.3 percent reported no change. It is interesting, however to note that between the ages of 43 and 50 the proportion reporting that they enjoyed an increase declined with age. A

comparison is made in **Figure 16**. Anticipating reduced incomes in late life, many young and middle-aged workers would have a life-cycle motive to save even if they did not intend to retire completely.

³⁹ The survey was taken in 1895 and so workers were asked to look back to 1890. Nationally the wages of production workers in manufacturing fell slightly between 1890 and 1895 [Officer 2009: table 7.1].

⁴⁰ The year 1888 saw national wages twelve-percent higher than they had been five years earlier while 1893 was generally depressed, wages were only 5.5 percent higher than in 1888 [Officer 2009: table 7.1].

In the study conducted by the Michigan Bureau of Labor and Industrial Statistics in 1889 of the workers in Michigan's furniture industry respondents were asked the number of years each had been in his current *occupation* and how many years he had been with his current employer [Michigan 1889; Carter, Ransom, Sutch, and Zhao, MI07, 1993].⁴¹ Thirty-two percent of those between 40 and 67 reported that they had changed occupations within the last 18 months and 65 percent had changed employers at least once within the preceding five years. Thirty-two percent of the workers had changed occupations in the preceding five years suggesting that men had the opportunity to adjust to the demands on their body by changing employers or occupations.

1.2.4 Retirement

A possibility that might explain the patterns in the average number of months lost to unemployment seen in the two tabulations by age based on the censuses (Figure 9, page 29) is the increasing rates of retirement (more properly, “nonemployment”) with age.⁴² As mentioned, the censuses recorded the gainful occupation of workers defined as their “habitual occupation” regardless of whether they continued to work. Those who had been retired for more than one year should have then recorded 12 months of unemployment. **Figure 17** indicates that the number of men who reported no employment during the previous year rises sharply after age 60. There can be no doubt that many men were without remunerative employment in old age even in the late nineteenth century.

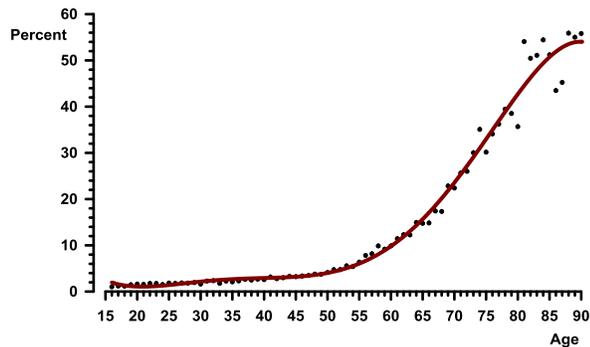
⁴¹ The canvass covered a total of 73 firms in 24 cities and surveyed 5,419 workers. The investigation, according to the *Report*,

has been systematically carried on through special agents, employed by this bureau, who have visited the various factories, and had personal interviews with the men employed, ... The answers to the questions enumerated in the tables are therefore the personal testimony of the men employed, and are entitled to credit.

⁴² Retirement in the modern sense is an intentional and planned withdrawal from the labor force. The available statistics from the nineteenth century do not make it easy to infer which nonemployment was intentional and permanent and which was forced upon older workers by age discrimination and slack labor markets. For our purposes in studying the motivation for life-cycle saving it does not really matter as long as young men could foresee the day when they would experience long spells of nonemployment.

The employment rate for men sixty and older was reported by the census for 1870 and 1880 at 64.2 percent and 64.3 percent respectively [U.S. Census Office, 1870: volume III, p. 832; 1880: 714]. Carter and I offer a revised estimate for 1880 based on the IPUMS sample for that year of 68.3 percent [Carter and Sutch 1996: 15]. The 1900 IPUMS sample suggests an employment rate of 67.7 percent. In 1930 the rate was 64.5 percent [Durand 1948: table A-2, p. 199]. Taken together these estimates suggest no major change in the rate of non-employment during the sixty years preceding the Great Depression and the enactment of Social Security. See Figure 5 on page 22.

Figure 17. Percentage of Males, 16 to 90, who reported No Employment in the Previous Twelve Months, 1900



The withdrawal of older men from industrial occupations is also suggested by the various worker samples we have been investigating. For example, the New Jersey survey of the trade life of journeymen reported very few men aged 60 or older were employed in the trades. **Table 5** reports that less than 1 percent of workers in the six New Jersey industries were older than 59. The census of New Jersey, however, reported that over eleven percent of adult men were older than 59 [Carter *et al.* 2006: table Aa4777-4877, pp. 298-299]. None of these industries were experiencing rapid growth in the period before the study, so the small number of workers 60 and over cannot be explained by a lack of employment history.

A paper by Lisa Dillon, Brian Gratton, and Jon Moen [2010] examines the Canadian Census of 1901 and sheds some light on the prevalence of retirement in that country which may be relevant for the U.S. case.⁴³ Canadian officials not only asked each worker for his or her gainful occupation but also included a separate question asking if they were retired. “Factoring

⁴³ There is some reason to suppose that the problems of nonemployment and the need for old age support was similar for manufacturing and industrial workers in Canada to the situation in the U.S. See the contributions by Livio Di Matteo [1997, 1998].

in acknowledgment of retirement shifts the portrait of Canadian elderly men's work activity considerably, especially among the very old" [Dillon, Gratton, and Moen 2010: 41]. The authors go on to conclude that "the data provide strong evidence that any series based on occupational report substantially exaggerates labour force participation" [p. 42]. According to their estimates 71 percent of men 60 and older were in the labor force in 1901. Assuming an unemployment rate of approximately 4 percent,⁴⁴ the employment rate for men 60 and older in Canada in 1901 would then be 68 percent, surprisingly close to the U.S. estimate for 1900 of 67.7 percent.

1.3 A Saving Strategy to Secure Old Age

Social historians suggest that the late-nineteenth century was a time when Americans worried a good deal about old age [Fischer 1974; Achenbaum 1978]. I have presented evidence on nonemployment, declining income with age, and occupational patterns for men which may explain why. I conclude that many older men during this period either left employment (voluntarily or involuntarily) or changed to less demanding jobs late in life. As a consequence they saw their incomes from wages decline as they aged. Whether this life-cycle deskilling was a product of an ageist society, an industrial system that could elicit greater contributions for a given wage from younger than from older workers, or was the result of deliberate decisions by workers seeking to reduce the burden of strenuous physical labor in their old age, the fact remains that workers were compelled to adopt a strategy early in life that would protect their economic security in old age. Since this was well before the period in which company or government pensions were available, the problem of old age security must have weighted heavily upon young families.⁴⁵

Two quite different strategies presented themselves as alternatives [Ransom and Sutch 1989]. The traditional method of providing support of older members of the population was to

⁴⁴ The U.S. unemployment in 1901 has been estimated to have been 4.14 percent [Weir 1992: table D-3, p. 341].

⁴⁵ Old age pensions for Union veterans of the Civil War were introduced in 1904 by the executive order of President Theodore Roosevelt and regularized by Congress in 1907 [Haber 1983: 112]. Before that date only veterans with a disability certified by three physicians was eligible for a pension [Eli 2015]. On the origins of company pensions after 1905 see Ransom, Sutch, and Williamson [1993].

rely upon transfers from younger household members [Leibenstein 1975]. An alternative strategy, which became feasible with the appearance of financial intermediaries in the mid-nineteenth century was to engage in life-cycle saving. For most workers the choice between the traditional and the modern approach had to be made early in their working life and the decision was irrevocable. Success with the traditional strategy depends upon producing a large family and, if nothing else, biology precludes indefinite postponement [Nugent 1985]. Moreover, once born, children could not be exchanged for financial assets should parents wish to switch strategies. Finally, the costs of rearing a large family would produce a strain on family income that would make subsequent saving difficult [Leff 1969, Oppenheimer 1982, and Lewis 1983].

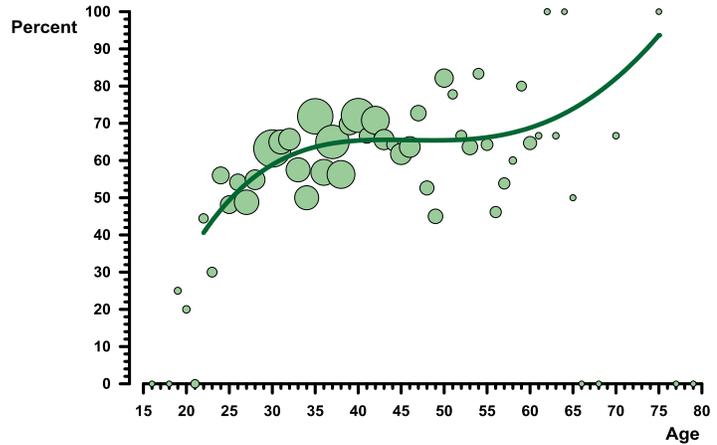
The transition from a traditional strategy to the self-reliant life-cycle strategy was a gradual process and not yet complete by the end of the nineteenth century. A cross section of saving behavior observed during the process of this transition should reveal both types of saving behavior. A majority of American families should have been pursuing the modern strategy in which they attempt to accumulate an acquired “competence” – in the words of Congressman Berger.⁴⁶ On the other hand, there might remain a minority of workers who either by choice or circumstance saved very little. Presumably they would have to turn to other household members should old age, illness, or unemployment require financial support. It is noteworthy that many studies of saving behavior conducted with twentieth century data produced evidence for the presence of both strategies. The prevailing consensus seems to be, in the words of Mervyn King,

That the life-cycle model, taken in its broadest sense, is consistent with the observed behavior of a majority of households, but that there exists a minority of households for which the model appears to be inadequate [King 1985: page 2 in the 1983 working paper version].

⁴⁶ The word “competence” was commonly used to denote a skill in a specific trade acquired through training or experience – “he is a competent carpenter” – but the broadened meaning to denote the ownership of liquid assets sufficient to finance retirement was introduced by Henry K. Oliver, the first Commissioner of the Massachusetts Bureau of Statistics and Labor.

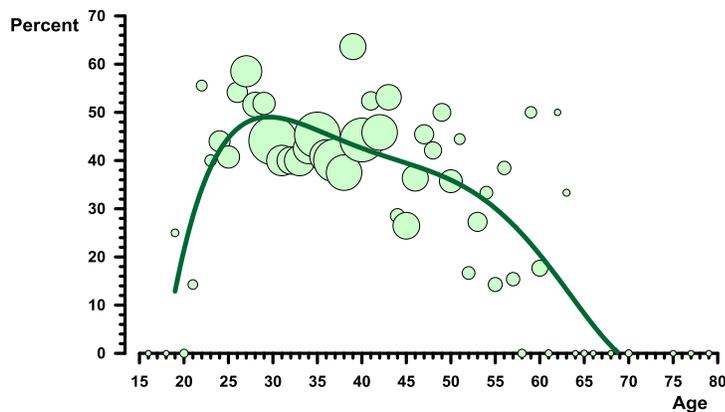
The Kansas surveys of 1885-1887 asked if the respondents had accumulated savings in past years. Over sixty percent replied in the affirmative. **Figure 18** plots the responses by age. The same survey asked if there were any savings in just the past year. These responses are plotted by age in **Figure 19**. As expected, there is an evident tendency for saving to decline at the older ages.

Figure 18. Percentage of Respondents who Accumulated Savings in Past Years, Kansas Workers, 1885-1887



Presumably incomes for the older men had begun to fall and the incidence of unemployment was rising, so saving was more difficult. In some cases dissaving from previously acquired assets

Figure 19. Percentage of Respondents who Saved During the Past Year, Survey of Kansas Workers, 1885-1887



might have been necessary to maintain consumption.

A similar age profile of savers is evident in the responses to the Wisconsin study of 1895. In **Figure 20** the single men are plotted with yellow bubbles and the men with families with green bubbles.

Savings rates were quite high.

Figure 21 indicates the fraction of total earnings saved by Kansas families who did save during the past year. The plots indicate that something like 25 to 35 percent saving rates were reported.

Figure 22 displays the saving rates for the Wisconsin workers. They reported savings rates in the neighborhood of 25 percent.

**Figure 21. Average Savings Rate of Respondents who Saved During the Past Year
Kansas Workers, 1885-1887**

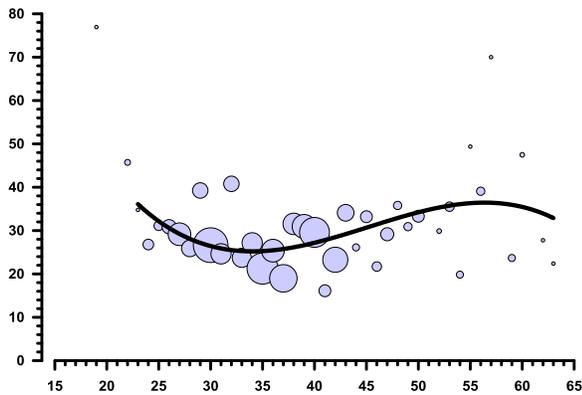
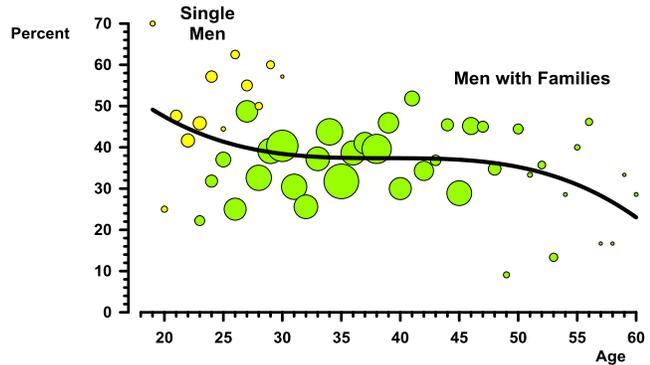
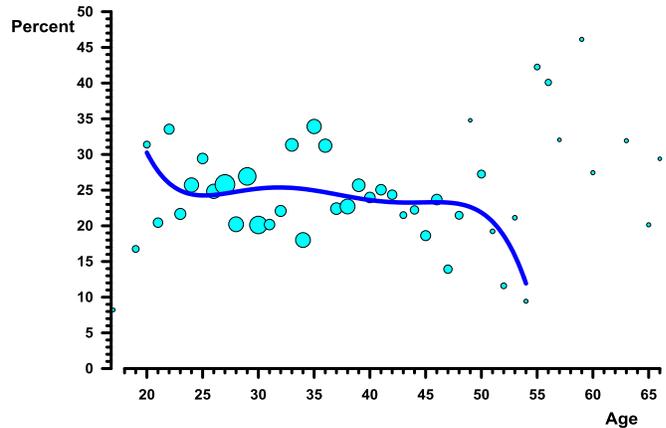


Figure 20. Percentage of Respondents who Saved During the Past Year, Wisconsin Workers, 1895



**Figure 22. Average Savings Rate of Respondents Who Saved During the Past Year
Wisconsin Workers, 1895**



1.4 Asset Holdings

If life-cycle saving was prevalent among industrial workers, then I would anticipate that the workers surveyed by the state bureaus would own substantial wealth by their 50s. None of the worker surveys report total wealth, however several reported homeownership. A home is an excellent life-cycle asset. Since the home provides a continuous stream of services, it is partially annuitized. In old age rooms can be rented to provide a stream of income or the home could be sold and the proceeds used to finance consumption, including the rent of smaller quarters. It may surprise some that the fraction of workers reporting that they owned a home in Kansas and Wisconsin exceeded 60 percent by age 50. The age profile of home ownership for Kansas in

1899 is displayed in **Figure 23**. The data for Wisconsin in 1895 is in **Figure 24**. The workers surveyed were industrial workers living in urban settings, while many lived in tenements or rented rooms in another's home, many others seemed able to acquire the capacity to purchase.

Figure 23. Percentage of Respondents who Owned a Home, Survey of Kansas Workers, 1899

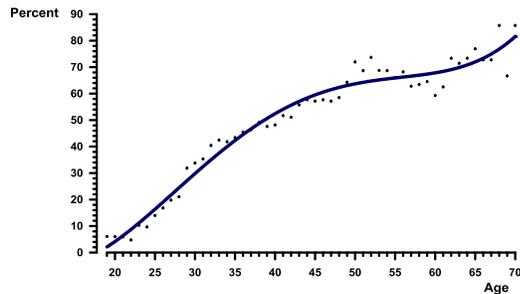
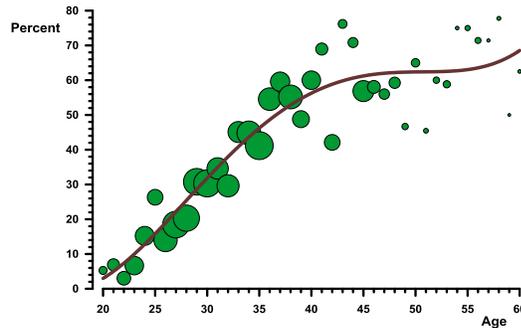
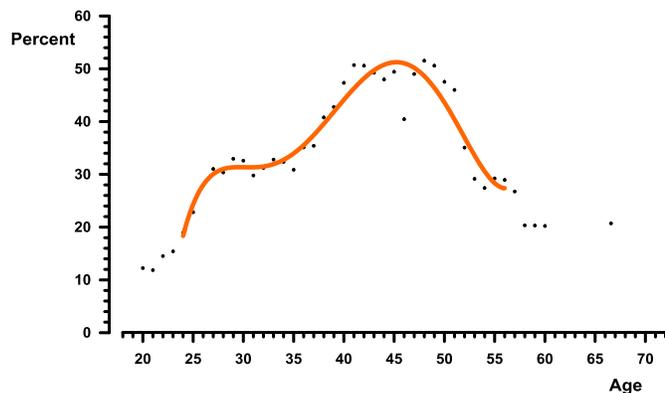


Figure 24. Percentage of Respondents who Owned a Home, Survey of Wisconsin Workers, 1895



Another asset reported by the Kansas workers in 1885-1887 was a life insurance policy. In all likelihood these were tontine policies. This peculiarly nineteenth-century form of life insurance worked like a combination of term life insurance, which protected the family in the event of the premature death of the family breadwinner, and a pre-purchased annuity beginning when the life coverage ended. Ransom and I have described the popularity of the tontine policy elsewhere [Ransom and Sutch 1987]. We estimated the total volume of tontine insurance in force exceeded 7.5 percent of the total national wealth in 1905 [p. 385]. As a rough guess, we estimated there may have been as many as 9 million individual tontine policies for a population of 18 million households [p. 386]. The ownership of insurance among Kansas workers in 1885-1887 exceeded 50 percent of men in their 40s. **Figure 25** displays the age profile. These significant rates of home ownership and insurance policies suggest that wealth holding was significant among working class families late in their work life.

Figure 25. Percentage of Respondents who Owned an Insurance Policy, Kansas Survey of Workets, 1885-1887



Part II: Wealth in the Gilded Age

Poor Vanderbilt! ... You are an old man, and ought to have some rest, and yet you have to struggle and struggle, and deny yourself, and rob yourself of restful sleep and peace of mind, because you need money so badly. I always feel for a man who is so poverty ridden as you. Don't misunderstand me, Vanderbilt. I know you own seventy millions ... But you! you have got seventy millions, and you *need* five hundred millions, and are really suffering for it. Your poverty is something appalling. ... I would freely put ten cents in your tin cup, if you carry one, and say, "God pity you, poor unfortunate!"

Mark Twain (1869)⁴⁷

In 1870 the U.S. conducted a census of wealth. I see this census as an opportunity to explore the Twain-Warner-Piketty vision of the Gilded Age [Twain and Warner 1873, Piketty 2014: 348-350]. I propose to reexamine the 1870 data, not only because that is the primary source for Piketty's evidence on the Gilded Age, but also because it is no doubt the best data we have on the distribution of wealth before 1916. That year the Census Office collected data from every adult enumerated as part of the decennial count of the population, asking the value of the real estate owned and the amount of personal property held.⁴⁸ There is a one-percent sample of the individual-level returns with information on age, sex, occupation, and family relationships [Ruggles *et al.* 2010]. The information collected has, as should be expected, some deficiencies, but with due attention to the quality of the data and the conceptual problems that confound its interpretation, I am willing to proceed.

Given the strong evidence from the worker surveys surveyed in Part I, one might be tempted to skip over the evidence on cross section age-wealth profiles. After all, the cross sections are a snapshot of the population at a point in time, a "synthetic cohort." These can be misleading if interpreted as the life-time profile of a typical individual or household. In an economy experiencing strong economic growth, for example, the wage incomes of the young

⁴⁷ Samuel Clemens writing as Mark Twain [1869], reprinted in Louis Budd [1992: 287-288].

⁴⁸ This was not the first time such a census was conducted, but it was the last. The same two questions about real estate and personal property were asked in 1860 and the real estate question was asked in 1850.

would be high relative to the retirement incomes of the old (which would have been financed by savings out of lower, past, wages). That effect might exaggerate the apparent decline of wealth as an individual aged. Michael Hurd, discussing twentieth century data, suggests the only reliable tests of the life-cycle hypothesis employ longitudinal data [Hurd 1997: 933, also see Jianakoplos, Menchik, and Irvine 1989: 638].

Despite these problems, I think it worthwhile to explore the census of wealth data provided we remain attentive to the potential pitfalls. First, it is a remarkable data set, unmatched for coverage by any twentieth century data. Lee Soltow, the dean of researchers in this field, described the data as “precious,” too valuable to ignore [Soltow 1975: xix]. The census of wealth data has another virtue, it includes everyone. My sources for Part I were surveys of *workers*, thus it was not possible to explore the “dissaving” behavior of households whose heads were not employed.⁴⁹ The 1870 census of wealth included workers, but also farmers, capitalists, professionals, *and* those without work.

Furthermore, the 1870 data is more transparent than surveys of wealth and panel studies of household finance conducted in the last forty years. Interpretation of modern data is complicated by the existence of social security, pension funds, tax advantages, government subsidies to pension contributions, a developed annuities market, and the routine reliance upon expensive late-life medical interventions. America was innocent of these institutions in 1870. That fact may make it easier to identify life-cycle behavior. Finally, quite apart from testing for the presence of life-cycle effects, the 1870 data are intrinsically interesting in themselves and they have been essentially ignored by economic historians.⁵⁰

⁴⁹ While full retirement was not uncommon for the very old, accumulated assets were primarily a protection against falling income and enforced idleness at a time when many elderly could not depend upon their grown children to support them. On “retirement” trends in the late nineteenth and early twentieth centuries see Ransom and Sutch [1986, *JEH*, and 1989], Ransom, Sutch, and Williamson [1991], and Carter and Sutch [*Historical Methods*, 1996].

⁵⁰ I know of only one paper published in recent years that focuses on the 1870 wealth data. In that study the authors examined the regional inequalities in the distribution of wealth in 1870 [Rosenbloom and Stutes 2008].

2.1 Previous Work

Lee Soltow was the pioneer in using the census data to study patterns of wealth holding. He devoted his career to collecting nineteenth century data on wealth and income inequality. In his major contribution, *Men and Wealth in the United States, 1850-1870* [1975], Soltow reported findings based on “spin samples” drawn from the microfilms of the census enumerations. He marked a spot on the glass screen of the microfilm reader, turned the crank a half turn, and sampled the individual whose name fell on the marked spot provided it identified a male 20 years old or older. He proceeded in this fashion through all 1,761 rolls of microfilm for the 1870 census! The resulting sample size was nearly ten thousand [Soltow 1975: 4-5]. In this work and in an earlier book devoted to Wisconsin, Soltow presented scatter diagrams and moving average charts that plotted wealth by age [for examples see Soltow 1971: Exhibit 5, p. 37; 1975: Chart 3.2, p. 78]. Despite the fact that his chart for Wisconsin revealed a hump-shaped cross section of mean wealth and the U.S. data revealed “evidence the individual dissaves after he is in his forties” [1975: 73], Soltow fit linear [1975: 80] or exponential relationships [1971: 36] rather than a polynomial to summarize the wealth by age data.⁵¹

Although Soltow’s extraordinary efforts at data collection are impressive, he had little influence on the study of saving in the nineteenth century. Partly this is due to the fact that the two books are dense, obscure, and difficult to read. As William Parker put it, supposedly quoting Huck Finn’s appraisal of the Bible, Soltow is “good readin’ but tough” [Parker 1974, 1975].⁵² Soltow did not refer to the life-cycle hypothesis nor did he cite Modigliani. He did not

⁵¹ Soltow’s work on wealth holding in the nineteenth-century U.S. was foreshadowed by Robert Gallman [1969]. Gallman drew a small and geographically limited sample from the manuscript census returns to document the distribution of wealth. He did not explore wealth holding by age.

⁵² The quip is classic Bill Parker (so good, he used it twice), but it’s not exactly Mark Twain. In chapter 17 of *Huckleberry Finn* the protagonist relates the following: “There was some books, too, piled up perfectly exact, on each corner of the table. One was a big family Bible full of pictures. One was Pilgrim’s Progress, about a man that left his family, it didn’t say why. I read considerable in it now and then. The statements was interesting, but tough” [Twain 1885].

discuss the likelihood or prevalence of retirement other than to note, almost as an aside, that “wealth is the goal because it is needed to provide retirement income” [1975: 90].⁵³

A cross section of wealth holdings observed during the process of transition from a traditional strategy to a life-cycle strategy should reveal both types of saving behavior. However, making such inferences from the data is problematic. Although these data are a cross section of the population in 1870, I want to view the wealth-age profile as tracing out a reasonable approximation of the change in wealth as an individual household aged. If that is a legitimate perspective and if many households were following a life-cycle strategy, the wealth data should display a hump shape – the profile would rise to a peak somewhere around ages 55-65 and then decline. The declining portion of the wealth-age profile would reflect the tendency of households to liquidate and spend their accumulated assets in this phase of their life cycle. Modigliani even asserted that the hump-shaped wealth-age cross section “represents the crucial proof” for his life-cycle theory of saving [Modigliani 2001: 77].

Appropriately specified tests of the life-cycle model using data from the 1970s have provided support for the hump in the cross-section wealth-age profile and for dissaving by the retired [Diamond and Hausman 1984; Hurd 1987, 1989, 1990 and 1997: 932; Shorrocks 1975: 157 (for the U.K.); and (for Canada,) King and Dicks-Mireaux 1982]. There are however two important qualifications. First, these studies revealed that a minority of those surveyed do not display the saving behavior that would generate the wealth humps predicted by the life-cycle hypothesis [Diamond and Hausman 1984: 81-83, King and Dicks-Mireaux 1982: 249-251]. This minority appeared to have a lower-level of educational attainment. Second, there is an even smaller minority, the very rich, who save far more than can be predicted by life-cycle behavior [Hurd and Mundaca 1989; Carroll 2002; Dynan, Skinner, and Zeldes 2004; and Fan 2006]. The 1870 data might gauge the relative size of the two minorities one hundred years earlier.

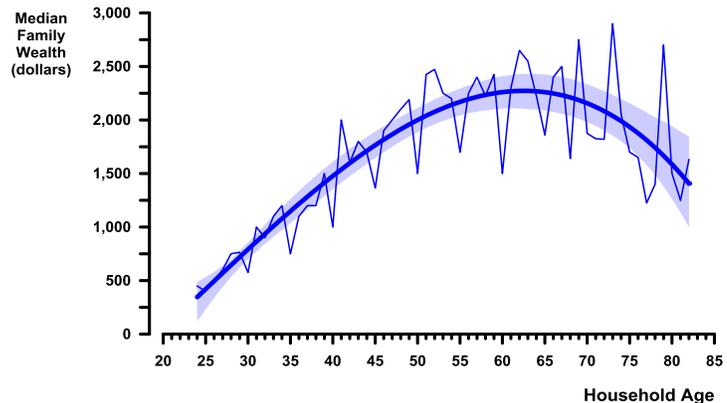
⁵³ Despite a public plea by a distinguished colleague that he share his data [Lebergott 1976: 796-797], Soltow never did so and even refused to provide his data to a “very prominent economic historian ... on the grounds that the scholar would misuse it” [Vedder 2005]. I believe the raw data no longer exists.

There are, as is well known, pitfalls to avoid when interpreting cross-sections by age as longitudinal data [Jianakoplos, Menchik, and Irvine 1989, Hurd 1997: 931-938]. Briefly put these include confounding cohort effects, possibly strong period effects, cohort specific life-time shocks, a correlation between wealth and mortality, and – my particular focus in this paper – the aggregation of heterogeneous groups displaying a diversity of behaviors. Bear with me. I will discuss each of these issues with the objective of raising confidence in my conclusion, but only after I introduce Exhibit A.

2.2 The 1870 Wealth-Age Profile

Before delving into the definitions, difficulties, and disclaimers, I begin by displaying in **Figure 26** an 1870 wealth-age profile of household wealth for a “core sample” consisting of all households headed by an individual born outside of the slave states.⁵⁴ I present for each single year of age the median level of family wealth using a linear scale for the vertical axis. I have superimposed a polynomial curve to fit the data. I have added the 95-percent confidence intervals around the smoothed estimate.⁵⁵

**Figure 26. Median Family Wealth by Household Age
Core Sample, 1870
(linear scale)**



⁵⁴ The data on wealth was reported in columns 8 (for real estate) and 9 (for other personal property) of the same form used to record the population data for the 1870 census [U.S. National Archives, 1870 U.S. census, population schedules]. The data employed in this paper is drawn from the 1-percent public-use sample of the enumerators’ manuscripts downloaded from the IPUMS-USA website [Ruggles *et al.* 2010]. Screen images of the original manuscript returns are available from Ancestry.com [2009].

⁵⁵ This is the confidence interval around the polynomial curve assuming that each observation of the median wealth is an accurate measure. Since we have only a 1-percent sample of the 1870 Census, there is also a sampling error not taken into account. A lowess fit with a band width of 0.4 has essentially the same shape as the third degree polynomial.

The data show that median household wealth rises from about \$400 at age 24 to around \$2,225 at age 60.⁵⁶ Wages for production workers in 1870 were less than 12 cents per hour [Officer 2009: Table 7.1, p. 166]. A full week's work was at least 10 hours for six days [Sundstrom 2006: figure Ba-O, p. 47]. If the worker was lucky enough to work a full year without downtime or layoffs, his annual income would be somewhere around \$360. Thus the median household had accumulated wealth equivalent to two years of a production worker's income by age 30 and equivalent to more than six years income by age 60. Male life expectancy at age 60 was 14.4 years in 1870, female life expectancy was 15.3 years [Carter *et al.* 2006: series Ab664]. Of course, not everyone retired at age 60, so accumulations of that size are quite impressive.

Before turning to the very legitimate question of what conclusions we can draw about individual motives for saving and wealth ownership from a cross section of medians, I should explain the nature of the data and defend the choices I have made in preparing the raw numbers for presentation in Figure 26.

2.3 The 1870 Census of Wealth

A census of the population is required by the U.S. Constitution every ten years to reapportion the House of Representatives. Political tensions were unusually high in anticipation of the census of 1870 and in the aftermath of the Civil War. Before the end of slavery, slaves counted only three-fifths of a person in establishing the size of each congressional district (Article I, Section 2, Clause 3 of the U.S. Constitution). After emancipation the freedmen were to be accorded parity with everyone else in the reapportionment. The Republican Congressmen from the northern states were concerned about the additional seats for southern states that were likely to elect members of the Democratic Party.⁵⁷ While a compromise was sought, the bill authorizing the

⁵⁶ That would be over one-half million dollars if evaluated relative to today's average compensation of production workers [Williamson 2010].

⁵⁷ The political ideologies of the Republican and Democratic parties switched in the mid-twentieth century. In the nineteenth century Republicans championed civil rights, social safety nets (pensions), and the primacy of the federal government. The Democrats were the conservative party favoring states' rights and segregation of the races.

census was held in abeyance. With the compromise enacted by the Fifteenth Amendment in February of 1870 and Section 2 of the Fourteenth Amendment, Congress lost interest in reforms to improve the basic machinery of census taking. Thus the Census of 1870 was conducted employing the same procedures used in 1860, which in turn had been defined ten years before by the act to conduct the census of 1850 [Anderson 1988: 72-82].

The two questions on wealth were carried over from the 1860 Census. The instructions to the U.S. Assistant Marshalls who enumerated the 1870 census read:

Property. Column 8 will contain the value of all real estate owned by the person enumerated, without any deduction on account of mortgage or other incumbrance, whether within or without the census subdivision or the country. The value meant is the full market value, known or estimated.

"Personal estate," column 9, is to be inclusive of all bonds, stocks, mortgages, notes, live stock, plate, jewels, or furniture, but exclusive of wearing apparel. No report will be made when the personal property is under \$100.⁵⁸

Figure 27 reproduces a portion of the enumerator's manuscript for the city of Buffalo, in Erie County, New York.⁵⁹

| | | | | | | | |
|----|-----------|--------------------|----|---|-------------|---------------|---------|
| 7 | 1131 | | | | | | |
| 8 | 1132/1104 | Clemens, E. L. | 30 | M | Inspector | 10000 | W. of |
| 9 | | Olivia | 24 | F | Wife | 14000/8000 | W. of |
| 10 | | Mrs. J. J. Patrick | 26 | M | Crackerman | | Ireland |
| 11 | | Bomb | 23 | F | Low servit | | England |
| 12 | | White, Ellen | 27 | F | Low servit | | Ireland |
| 13 | 1133/1105 | Lord, John | 62 | M | Builder | 35,000/10,000 | England |
| 14 | | Bussell | 13 | F | Westchester | | |

Figure 27. Reproduction from the manuscript returns of the 1870 Census

⁵⁸ The wording of the instructions can be found most easily on the IPUMS website. They may also be found in the Census publication, *Twenty Censuses* [U.S. Bureau of the Census, 1978]. The exclusion of personal estate under \$100 was not part of the instructions to enumerators of the 1860 Census.

⁵⁹ Source Citation: Year: 1870; Census Place: Buffalo Ward 10, Erie, New York; Roll: M593_935; Page: 558B; Image: 310; Family History Library Film: 552434 [Ancestry.com 2009]. Mr. Clemens and his household members are not included in the one-percent sample available from IPUMS.

On lines 8-12 we find the following entries:

| | | | | | | |
|----------------|----|---|---|--------------------|--------|--------------|
| Clemmens, S.S. | 30 | M | W | prop'r daily paper | 10,000 | N York |
| ---- Olivia | 24 | F | W | keep'g house | 14,000 | 8,000 N York |
| McFey, Patrick | 26 | M | W | coachman | | Ireland |
| Brown, Marg't | 23 | F | W | dom serv't | | N York |
| White, Ellen | 29 | F | W | dom serv't | | Ireland |

If we ignore the obvious misspellings and abbreviations this is undoubtedly the household of Samuel L. Clemens [1835-1910], his wife, Olivia, and 3 servants. Today Mr. Clemens is better known by his pen name, Mark Twain, America's most famous (and funniest) humorist and the author of the novels *Adventures of Tom Sawyer* (1876) and *Adventures of Huckleberry Finn* (1885). At the time of the 1870 census he had just moved to Buffalo to marry Olivia Langdon and to take over the editorship and part ownership of the Buffalo *Express*. The census recorded his occupation as proprietor of a daily paper. Clemens claimed \$10,000 of real estate and his wife recorded \$8,000. In his autobiography Twain reported that his wife's father "had bought and furnished a new house for us in the fashionable street, Delaware Avenue, and had laid in a cook and housemaids, and a brisk and electric young coachman, an Irishman, Patrick McAleer" [Smith 2010: 321].⁶⁰ It is a sample of one, to be sure, but here the written memoir is consistent with the census record.

2.4 Gross versus Net Wealth

Aside from the exclusion of clothing and the \$100 lower-truncation for personal property, the census's definitions of wealth seem fairly inclusive and when summed together with some estimate to replace the value of personal estate when the census report of that number is left blank, the census figures should provide a reasonable estimate of *gross* wealth. We might prefer *net* wealth (assets less debts), but in 1870 gross and net worth were more similar than they are today. In the 1880s and 1890s less than one-third of homes were mortgaged. Even for the

⁶⁰ The census taker's informant was probably Olivia. Her age and birth place are accurately recorded. However, her husband was 35, not 30, and he was born in Missouri, not New York. How McAleer became McFey is open only to conjecture. The cook mentioned by Twain was Ellen White [Smith 2010: 578].

minority financed with debt, the mortgages typically matured in less than four years and required only the payment of interest while they were outstanding.⁶¹ The encumbrance was generally between one-third and one-half of the property value [Snowden 1987, 2006: 399; Eichengreen 1984]. The 1870 census was taken, however, just before the national mortgage market developed [Snowden 1995]. In that year, mortgages were probably less common; certainly less standardized; and were more often granted by family members, local merchants, and neighbors than by financial intermediaries.

The age profile of gross wealth is likely to rise to its peak more rapidly than would be case for the profile of net wealth, but the inclusion of the gross value of mortgaged real estate in wealth is unlikely to disguise or exaggerate any evidence of dissaving and deaccumulation at older ages. Home and farm mortgages were likely to be acquired when the household is young and paid off before dissaving began. I conclude the bias from using data on gross wealth rather than net wealth will be small.⁶²

2.5 Consanguineal Families

The wealth variable I report in Figure 26 is the total wealth recorded in the census for all members of the immediate consanguineal family unit *living together in the same household*. I am presuming that these family members form a single economic unit with shared resources and non-conflicting economic goals and interests.⁶³ The immediate consanguineal family is defined to consist of the household head, his spouse, their unmarried children, and their resident (and presumably dependent) parents, whether these relationships are by blood, marriage, or adoption. Siblings, other relatives, nonrelatives, domestic servants, and boarders are not included. Thus

⁶¹ It was not uncommon however for the borrower to renew the mortgage several times before accumulating enough saving to pay the principle owed.

⁶² A small sample of homeowners in Maine collected twenty years later, hints that this might be so [Maine, Bureau of Industrial and Labor Statistics 1891; Sutch 2010]. There is only about a four percentage point difference between gross and net values of homes at age 30. A sample of 549 farm owner-operators in Wisconsin taken in 1895 found that only 35 percent had a mortgage [Wisconsin 1896; Carter, Ransom, Sutch, and Zhao, WI107A, 1993].

⁶³ This unity of economic interests might be by choice or be imposed by the patriarch.

the total wealth for the Clemens' household would be the sum of Samuel and Olivia's reports, \$32,000. That was quite a fortune for a 35-year old in 1870.⁶⁴ The couple was obviously a beneficiary of Olivia's father's generosity.⁶⁵

In 1870 the census did not specifically enquire about the relationship of household members to the head or their marital status. Instead the instructions to the census enumerators specified that within each household, "the names are to be written beginning with the father and mother; or, if either, or both, be dead, begin with some other ostensible head of the family; to be followed, as far as practicable, with the name of the oldest child residing at home, then the next oldest, and so on to the youngest, then the other inmates, lodgers and boarders, laborers, domestics, and servants." The IPUMS project imputed the relationships using a set of logical rules based on this ordering, the age, sex, and surname of each individual.⁶⁶

2.6 Household Age

"Household age" is defined to be the age of the household head or the age of his wife if his wife is younger than he.⁶⁷ My logic is that when a couple is engaged in life-cycle planning for old age, the age of the youngest member of the pair is relevant to determining the target wealth required on the date of the husband's retirement. The younger the wife, the longer would be her

⁶⁴ That sum would be over one-half million dollars at current prices and nearly \$7.5 million if indexed by production workers wages [Williamson 2010].

⁶⁵ Jervis Langdon was very wealthy. He amassed a fortune from coal mines and a "huge rail and shipping network." The editor of Twain's *Autobiography*, reports that when Jervis died in August of 1870 he left bequests totaling \$1,000,000 [Smith 2010: 578]. According to his entry in the 1870 census archives, Jervis Langdon's household possessed \$50,000 in personal estate and \$400,000 in real estate. Source Citation: Year: 1870; Census Place: Elmira Ward 2, Chemung, New York; Roll: M593_914; Page: 161A; Image: 326; Family History Library Film: 552413 [Ancestry.com 2009]. The 1870 census was taken in June.

⁶⁶ When those rules proved an ambiguous guide IPUMS employed a "hot-decking" procedure linked to the 1880 census returns. For details on the imputation procedure see Ruggles *et al* [2010: Chapter 5 of "IPUMS Design"]. I excluded from the target population 67 cases where the head of household was hot decked. None of the results reported in this paper are sensitive to the precise boundaries set for the consanguineal family.

⁶⁷ A woman is head of the household, by definition, only when a spouse is absent either because she is widowed, divorced, abandoned, or never-married.

expected life remaining at the time of her husband's retirement.⁶⁸ Typically men married women younger than themselves. In 1870 the average age gap was 4.7 years. The effect of using household age rather than the age of the household head is significant. It shifts the age at which the wealth-age profile begins to decline from over 70 to 61.⁶⁹

In Figure 26 the age data are truncated at the right and left. Observations for households younger than 24 years of age are excluded because that seems to be approximately the age by which households are formed, the first child is born, and when the couple must decide between the traditional and the life-cycle strategy. The sample size thins out through the force of mortality at very high ages. There are less than 100 observations of households over the age of 82 in my core sample.

2.7 Born Outside the South

There are two reasons for excluding households headed by someone who was born in one of the slave states.⁷⁰ This rule excludes most former slaves who, as slaves, were unable to accumulate or even to own assets and who had been emancipated only five years earlier without a transfer of wealth from their former owners. These freedmen had little opportunity and insufficient time to accumulate a level of wealth appropriate to their age and income. Blacks also faced discrimination in the real estate market of the South that effectively restricted the ex-slaves' ability to own land [Ransom and Sutch 2001: 81-87]. This racial hostility must have served as a crippling disincentive to save in the primarily agricultural south. The second reason to exclude southern-born household heads is to exclude former slave owners. Before the end of slavery the white owners could anticipate being supported and served by their slaves when they entered old age. Before the war, they had a considerable fraction of their wealth invested in slaves. When

⁶⁸ In the nineteenth century few married women with a spouse present worked for wages.

⁶⁹ None of the twentieth-century studies of wealth-age profiles with which I am familiar employ household age. However, the difference in age between husband and wife is considerably lower today than it was in the nineteenth century, so the distortion produced by using the husband's age in studies with modern data would be less.

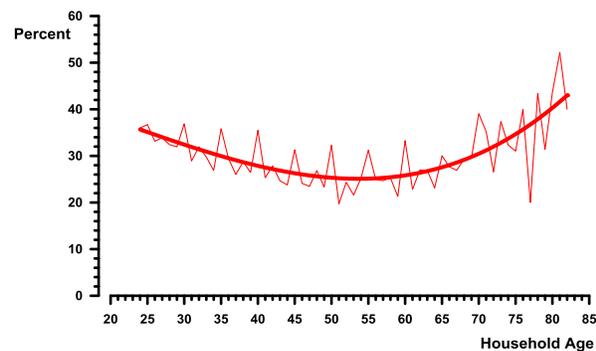
⁷⁰ Alabama, Arkansas, Delaware, the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina South Carolina, Tennessee, Texas, Virginia, and West Virginia.

the slaves were freed and their owners not compensated, former slave owners were thrown into a wealth-income disequilibrium that prompted them to engage in heavy saving in the years immediately following the war in an effort to restore some of their lost wealth [Ransom and Sutch 1988]. These distortions to “normal” patterns of wealth holding and saving were specific to the era and to the southern-born.⁷¹

2.8 Medians Rather than Means

Figure 26 displays the median wealth observed for each age. Medians have a big advantage over means for summarizing the data since they are insensitive to outliers. In this data set outliers have three possible origins. One source of outliers is the skewness of the personal wealth distribution. Even a small number of very large fortunes will raise the mean far above the median. Put another way, given the research questions at hand, means would give too much weight to the very wealthy. Another possible reason for extreme values would be errors in the data. The third source of outliers is the large number of reports of zero personal estate. As mentioned, the data for personal estate was not to be reported if the value was less than \$100. Not surprisingly, a significant number of households reported zero. This was particularly true for the recently freed slave population, quite understandably. However, by excluding the southern states most of ex-slaves are excluded from the data displayed in Figure 26. Yet thirty percent of the households in the non-slave states did not report personal estate. Reports of zero were more common for very young and very old households and for those

Figure 28. Percent of Households Reporting Zero Personal Estate, Core Sample, 1870



⁷¹ Note that the core sample includes the foreign born wherever they resided in the United States and includes those born in the North and West who resided in a former Confederate state.

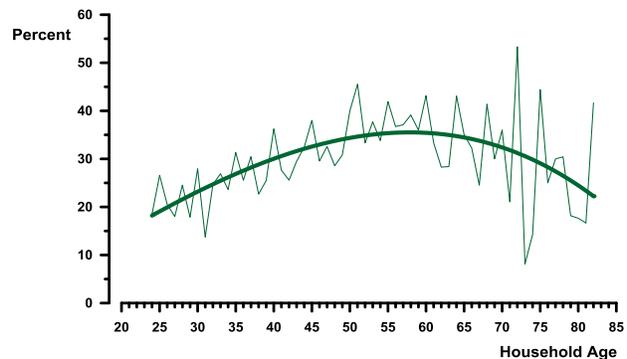
following the traditional strategy. See **Figure 28**. By reporting medians rather than means, the results are almost completely free of the bias that would be produced by the \$100 minimum.

2.9 Estimating Personal Estate when Blank

There are two possible reasons for a report of zero personal property. Some will have truly had less than \$100 of personal estate while others may have failed to answer the question. If they had no appreciable movable wealth was that because they were never savers or because they had once saved but since dissaved it away? The higher rates of missing reports of personalty for the young is no doubt because some of these households had yet to begin to save. The higher rates for the old might be because there would be some who had exhausted their stocks of wealth. If they did not answer was that because they resented the intrusive questions or because they were ill-educated? **Figure 29** suggests that

illiteracy rates were high for those who did not report portable wealth. The illiteracy rate of household heads who *did report* personal estate was 6.1 percent, while that for those who *did not report* was 14.4 percent. Excluding the illiterate from the target population would only make the hump shape of the cross section wealth-age profile more pronounced.

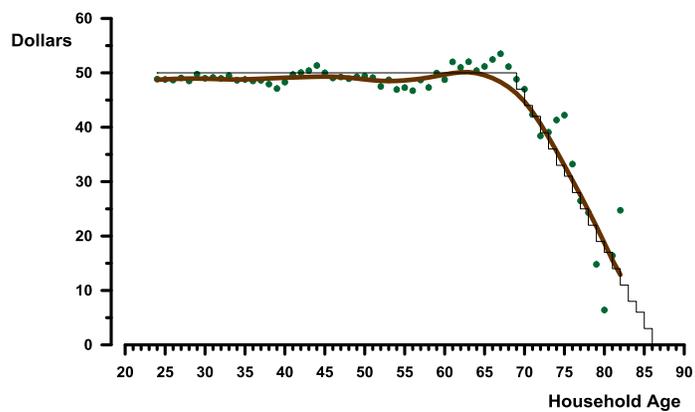
Figure 29. The Rate of Illiteracy of Family Heads among All Households Reporting Zero Personal Estate, Core Sample, 1870



Since one of the research questions is to quantify the proportion of the population that had not yet adopted life-cycle saving behavior by 1870, it would be unhelpful to exclude observations of individuals with low levels of wealth. Therefore I have made a rough estimate of the personal estate for any household reporting zero personal estate. To obtain an idea of what amount the \$100 minimum might exclude I have turned to the reports from the 1860 census. In

that year there was no minimum imposed on the personal estate question. The reports of the poor in 1860 can provide an order of magnitude for the personal estate holdings of the poor in 1870. **Figure 30** plots the average personal estate in 1860 for households that reported less than \$100 but more than zero dollars.

Figure 30. Average Personal Estate Reported by the "Poor" Core Sample Families, 1860
Households with less than \$100 but more than zero dollars of personal estate



The data from that year suggests that a fairly constant average of just under \$50 was reported for ages 24 to 69. Thereafter the average holdings of portable assets fell off sharply, probably reflecting the exhaustion of personal estate in late life.⁷² A linear extrapolation of that decline suggests that by age 87 the average portable wealth was close to zero. Using the 1860 picture as a guide, I arbitrarily set the personal estate to \$50 for every household under the age of 70 that recorded a blank for that question in 1870.⁷³ That sum would be equal to several month's pay for a manufacturing worker and seems a reasonable guess for the average amount of cash held between pay days plus the value of modest household possessions and tools of a trade.⁷⁴ For older households, I estimate their personal wealth would follow the declining stair steps plotted in the top panel of Figure 30. Making this adjustment which replaces zeros with a small number

⁷² One possibility is that the individual would turn over what little wealth might remain to a grown child in exchange for care in late old age.

⁷³ There were price increases between 1860 and 1870 that might be considered in connection with the \$100 minimum. However, the \$50 average in 1860 is heavily influenced by the tendency to report wealth in round increments. There is very pronounced heaping on the values of \$25, \$50, and \$75 with a close balance of reports (other than zero) on both sides of \$50. Since I expect a similar tendency to report a figure to the nearest \$25 in 1870, I have not made an adjustment to account for the inflation in prices.

⁷⁴ A horse would be worth about \$80 in 1870 [Carter *et al.* 2006: series Da984].

does not, of course, change the median values reported in Figure 26. It will, on the other hand affect the total volume of wealth and the average level of wealth holding.

2.10 Smoothing the Data

The medians at each age plotted in Figure 26 bounce around quite a bit. I believe that most of this variance about the smoothed curve is due to age heaping in the original source. Many ages recorded were reported as approximations, typically ending in five or zero and favoring ages ending in 2 and 8 over 1, 3, 7, and 9. This was due in part because some people did not know their exact age and in part because the respondent for the household (or the enumerator) was estimating the age of other members. Household heads and their wives (if married) were more likely to report an age ending in five or zero if they were illiterate or quite old. In either case they were likely to be poorer than those recording their age with precision. In Figure 26 the values of median wealth at ages 30, 35, 40, 45, and so on are all noticeably lower than the values at ages 29 and 31, 34 and 36, 39 and 41, . . . For this reason I have smoothed the wealth-age profiles in Figure 26 using a third-degree polynomial. In the literature, most researchers use a polynomial specification for smoothing wealth-age profiles. Had I used a more flexible non-parametric smoother, such as the locally weighted scatterplot smoothing technique (lowess) [Stata Corporation, 2007: 200-205],⁷⁵ the smoothed curves would be nearly identical to the polynomial. Both smoothing techniques indicate a pronounced hump shape with a peak at the same household age.

2.11 Avoiding the Cross-Section Pitfalls

Ideally one would want to study the life-cycle hypothesis of saving using a longitudinal study that made repeated observations of wealth, income, and consumption over the adult life span for a large panel of households. Such data sets are rare, even today. For the nineteenth century they are probably impossible to assemble. Few people kept financial diaries covering their entire life.

⁷⁵ The lowess technique estimates a smoothed value of the median wealth for a given age by estimating a linear regression using the observation at that age and data near and surrounding this point. The central point is given the highest weight and observations further from the point are given correspondingly lower weights. Only points within a specified bandwidth are included. The smoothed value is value predicted by this regression for the specified age. After some experimentation I settled on a bandwidth of 0.4, that is, 40 percent of the total age range.

Finding even one example from the nineteenth century preserved in an archive would occasion my surprise. Demographers and actuaries creating tables of life expectancy face a similar difficulty. They rarely have a large panel of lives where mortality can be observed continuously from birth to the last surviving member. One solution is to generate a life table from a cross section of deaths arranged by age. At a given point in time they calculate the percentage of one-year-olds who die, the percentage of two-year-olds who die, and so on. Then assuming the cross-sectional force of mortality remains constant as one looks into the future or back into the past, they can calculate a person's life expectancy. This is essentially what I have done by interpreting the cross section of wealth by age as if it represented the wealth profile of a (typical) household as it aged. But, as I have already remarked, there are a number of potential pitfalls that must be avoided before I can claim that the decline in wealth at older ages that I observed is due to late-life dissaving characteristic of the life-cycle saver.

2.12 Confounding Cohort Effects

Obviously the old people whose wealth is reported in Figure 26 began their working life earlier in the century than the young. Strong economic growth over the decades before the census might mean that the older individuals had lower incomes over their working life and thus less wealth accumulation than the middle-aged were experiencing at the time of the census. That effect might exaggerate the apparent decline of wealth in old age. The decline might simply indicate that the old had lower lifetime incomes rather than serve as evidence that they were dissaving.

Indeed, wages had been lower in the earlier years of the nineteenth century. **Table 6** presents the real average hourly compensation of production workers (in 1982-1984 dollars per hour) for several cohorts of men in the 1870 cross section observed when they were age 35. In the late nineteenth century the peak earning years for a man centered on age 35 (Figures 6-8, pages 24-25). Measured this way wages rose between 1830 and 1870 from about 64 cents per hour to 90 cents. Although real wages show an increase, the rate of the increase was slow – less than 1 percent per annum over the forty years. If the money saved by the older 1870 cohorts had been invested at interest, the rate of growth of their stock of wealth would have surely dominated the effect of lower incomes in the past. The rate of interest on New England municipal bonds

was consistently above 4 percent throughout this period [Carter *et al.* 2006: series Cj1194]. The source for the wage figures presented in the table is Lawrence Officer [2009] who actually provides an annual series. As a counterfactual exercise, assume that no one dissaved, no one retired, and the accumulated assets earned no interest. Would the rise in wages be sufficient by itself to produce a negative slope to the wage-age profile at older ages? The answer is “no.” The cohort effect is not strong enough to produce a false impression of life-cycle dissaving even if interest rates are zero.⁷⁶

2.13 Strong Period Effects

One difficulty of using a cross-section observed at one point in time, in our case that point was June 1870, is that there may be some momentary disruption that pushes the observations away from normal. During a period of high prosperity individuals might view some of their abnormally high income as transitory and save a very high fraction of the increment.

Conversely during a depression savings may be temporarily low (even negative) as households seek to stabilize consumption despite temporary declines in income [Friedman 1957]. If we were examining a cross-section of savings rates, this might be a serious confounding issue [Duesenberry 1949, Modigliani 1949]. However, accumulated wealth is less prone to these short-run fluctuations in the savings-income ratio. In any case, 1870 was not a particularly atypical year. An index of real gross domestic product per capita shows a mild decline for the year 1870 and the standard business cycle turning point series indicates a peak in economic activity in June of 1869 and a trough in December 1870 [Carter *et al.* 2006: series Ca11 and Cb5-6]. However, an alternative real GDP per capita series indicates no dip that year [series Ca16] and the index of industrial production [series Ca19] indicates healthy growth throughout the post-Civil War period up to 1873.

⁷⁶ An alternative to using Officer’s real wage data would be to use real gross domestic product per household (a crude measure of household productivity). Using data from Carter *et al.* (2006: Series Ae1 and Ca9) and backward extrapolation this measure grew even less rapidly over the period under consideration.

2.14 Cohort Specific Life-Time Shocks

A life-time shock changes life-time income (also called “permanent income”). If such a shock is confined to a fraction of the birth cohorts that make up the cross-section, then those cohorts will stand out (positively or negatively) from the cohorts that did not experience the shock. In the case of a cross section observed in 1870, the most obvious candidate for a cohort-specific shock is the Civil War. Fought between the states loyal to the Union and those that joined the rebellion, the Civil War remains the bloodiest American conflict on record. Military service and war-related deaths fell primarily on those born between 1830 and 1846. Over 2.2 million men fought on the Union side and their service likely reduced their earnings during war years and may have interfered with their ability to save. Their wives and children may have had to draw upon the family wealth in order to maintain consumption. The total death toll has been estimated to have been 750 thousand [Hacker 2011]. An additional 20 thousand Union men were wounded [Carter *et al.* 2006: table Ed1-5]. Almost all of the property damage during the war and the loss of wealth associated with emancipation fell on those born in the slave south. We have excluded those born in the slave south from our core sample partly for this reason. Claudia Goldin and Frank Lewis have estimated that the total direct cost of the war to the North totaled \$2.3 billion in 1860 prices. Of that total 1.8 billion were government expenditures that were financed by taxes, tariffs, debt issue, and the issue of fiat currency [Goldin and Lewis 1975: 304-305, Ransom 2006: 778-779]. Much of the burden of these expenditures were spread across cohorts, but the burdens of military service and risk of death were concentrated on the men and members of their households who were 24 to 40 in 1870. For this reason we suspect that the wealth owned by households in that age range might have been lower than it would have been had there been no war. If so, this effect is likely to reduce the slope of the wealth-age profile in that range. However, it is unlikely to exaggerate the decline of wealth after age 60.

2.15 Correlation of Wealth with Mortality

In modern data it has been shown that wealth and the hazard of mortality are negatively correlated [Attanasio and Hoynes 2000].⁷⁷ Presumably wealth can be spent in ways that improve health (better sanitation, better diet, greater access to medical intervention) so that as a consequence the rich live longer. Then the winnowing of the poor as we move to the higher ages would inflate the median wealth of the elderly. If this effect was strong in the nineteenth century, it would obscure the Modigliani hump and bias the results against my conclusion. On the other hand, the wealthy at that time may have been great risk takers. Christopher Carrol has conjectured that many rich become wealthy because they invested in risky assets (often their own business ventures) and were lucky [Carrol 2002]. If this was so in the years preceding 1870, then perhaps risk taking extended to engaging in hazardous adventures. This might weaken the wealth-longevity correlation or even turn it negative. There is, on the other hand, no evidence that dangerous activities of the rich, then or now, have produced sufficient accidental mortality to overwhelm the negative correlation between wealth and mortality, which presumably is mediated through expenditures on health and nutrition. I conclude that this source of bias is unlikely to disturb my conclusion that on balance older households were dissaving in 1870.

2.16 Wealth of the Retired

At older ages we expect the wealth reports to be coming from two distinct groups: those that remained at work, earning labor income, and those who were no longer employed. Most households in the first group would have had sufficient income to avoid the need to dissave while the second group would have entered the dissaving phase of their life cycle. This mixture would obscure the decline of wealth owned by the retired and shift the peak of the wealth-age profile to the right and to higher ages. Determining who are among the nonemployed in the 1870 returns with any precision, however, is probably not possible. The basic problem is that the census assigned each individual "to their habitual occupation, whether it is being at the time pursued or not" [U.S. Census Office, Ninth Census, *Wealth*, 1870: 805].

⁷⁷ The relationship is concave; weakening at high levels of income. This observation is known as the "Preston Curve" [Preston 1975].

Matters are even more complicated when it comes to the occupations reported for men 60 and over in 1870. The published volumes for the Ninth Census reported gainful occupation rates that were much lower for this group than that calculated from the IPUMS sample. According to the tabulations published shortly after the census was taken, the gainful occupation rate for men 60 and older was 64.2 percent [U.S. Census Office, Ninth Census, *Wealth* 1870: 832]. The one-percent IPUMS sample of 1870 reports valid occupational codes for 81.8 percent of males 60 and over.⁷⁸ A similar disparity exists between the published reports and the IPUMS counts for the 1880 Census. Carter and Sutch [*Historical Methods* 1996] concluded that the Census Office edited the original reports to remove older men who reported an occupation but were not employed. In its report, the Census Office explained the low published participation rate of older men by the "number of persons retired from active pursuits by reason of an acquired competence, of support secured from grown children, or of advanced age" (U.S. Census Office 1870 *Wealth*: 798).

This is not a particularly satisfactory description of what was done. Indeed, it is not even clear if this editing produced a particularly meaningful division between those elderly men still employed and earning income and those without employment. We can, however, examine the two of the three explanations for nonemployment mentioned by the Census: advanced age and support from grown children. We begin with age. Although the occupational classifications used by IPUMS included an unknown number of nonemployed with occupations, it is still the case many older men were not given occupation codes. I have defined a variable that includes

⁷⁸ This figure is based on the IPUMS variable *occ*. The habitual occupations reported in 1870 are classified by the IPUMS staff according to the 1880 published list of occupations. The 1880 occupational classification was oriented more to work settings and economic sectors – what might be better termed "industry" – than to workers' specific technical functions. Alternative classifications are possible. Using the IPUMS variable *occ1950*, which uses the classification scheme from the 1950 Census produces an occupational rate of 81.9 percent for males 60 and over. Using the IPUMS variable *labforce* gives an alternative count that indicates 81.7 percent reported gainful occupations. Inspection of the string variable *occstr*, which records the original unedited occupational entry as entered by coders examining the enumerators' schedules, confirms that many retired individuals were included in the IPUMS-defined labor force. However, many other retired men undoubtedly had an occupation recorded without the additional notation that they were retired.

all of those who were coded without a valid occupational title and plot the percentage of males without an IPUMS-valid occupation by age in **Figure 31**.⁷⁹ The plotted curve begins to rise around age 55. Clearly men were shedding occupational identifications as they reached advanced age.

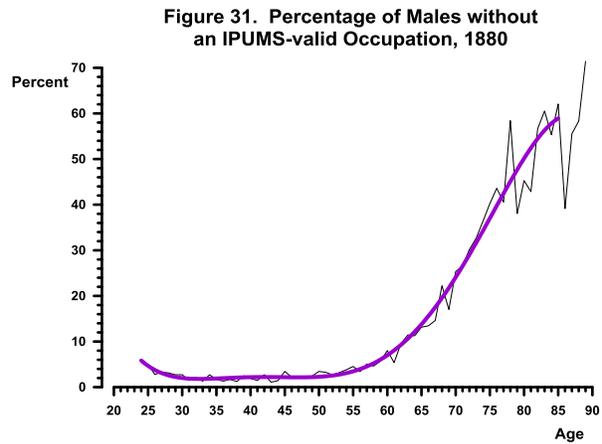


Figure 31. Percentage of Males without an IPUMS-valid Occupation, 1880

Figure 32. Percentage of Elderly Residing in the Household of a Grown Child, 1870

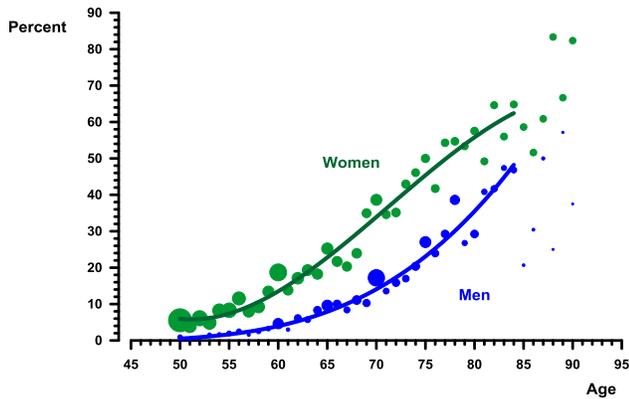


Figure 32 indicates the incidence of elderly adults to reside in a household headed by one of their grown children. Coresidence was more likely for women than men at each age. It is likely that this living arrangement was of necessity since over two-thirds of men coresiding with his own child and nearly 90 percent of women reported owning no wealth.

2.17 Quantifying those Following the Traditional Strategy

How many households were following the traditional strategy – as opposed to the life-cycle strategy – in 1870? This number could in principle be measured by the number of households with little wealth at the age that typically marked the beginning of sharply declining labor income. This would be around the late 50s and early 60s. I do not expect to make this measure with precision using the census data, but I can hope to make a ball-park estimate. How much

⁷⁹ Any individual coded without an IPUMS occupation in either the IPUMS variable *occ* or *occ1950* is regarded as without an IPUMS-valid occupation. There were 45 males, 24 to 84, in our sample that were coded with a 1950 occupation, but not an 1880 occupation. These men were recorded as “gentleman,” “gambler,” or “sportsman”, and one brothel keeper.” There were 5 men with an 1880 occupation but not so under the 1950 classification scheme. These included two ex-senators, an ex-sheriff, and an ex-judge.

household wealth would constitute evidence that life-cycle assets were sufficient by, say, age 60?⁸⁰ The answer depends upon the length of the life used by the couple for planning purposes, the anticipated earnings profile of the household after age 60, the desired level of consumption expenditures in the couple's advanced years, and the fraction of the total household wealth that is bequeathable and the fraction that is in the form of an annuitized asset.

A prudent householder would need to plan his life-cycle saving as if he and/or his wife would live to a "ripe old age." That would be longer than the expectation of life as measured by a life table or an insurance actuary. The mortality experience of adults in the mid-nineteenth century was fairly stable. Twenty-year olds could expect to live for approximately 40 more years, until age 60. Forty-year olds faced 28 more years of life on average, that is, until age 68; and 60-year olds had a remaining life expectancy of approximately 14 years [Haines in Carter *et al.* 2006, Volume 1, Table Ab656-703, pp. 442-446; for more detail see Haines 1998].⁸¹ The biblical length of life was "three score years and ten" – seventy years [Psalm 90:10]. As a rough approximation I will assume the biblical allotment would be appropriate, if both the husband and wife died before that age they would leave an unintended bequest of any remaining bequeathable wealth to their heirs.

Most households, of course, did not retire at age 60. Approximately two-thirds of men 60 and over continued to work. Suppose that a prudent individual might anticipate working beyond 60 if he were able, but that he would stop saving at that age. Imagine he could expect two-thirds of his prime-age income between age 61 and 70 (however this might be distributed over the period, year by year). By this calculation he would need three years and four-months' worth of

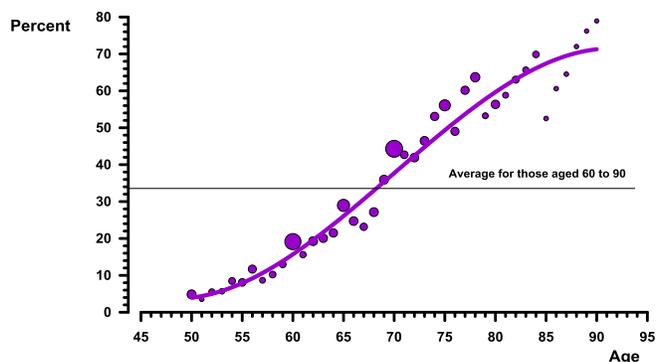
⁸⁰ We are referring to household age in this calculation. That is the age of the husband or that of the wife if she was younger than her husband.

⁸¹ The estimates of life expectancy estimated by Haines are very close to those set down in the American Experience Mortality Table of 1860 [US. Bureau of the Census, Glover 1921: Table 88, pp. 232-233]. That table was constructed by Sheppard Homans to represent the experience of the Mutual Life Insurance Company of New York. It was intended to represent the mortality experience in "healthful districts after the effects of medical selection was eliminated" [p. 224]. Homans' table was used by most insurance companies (by law in some states). The U.S. government used Homans' table for calculating the anticipated costs of soldiers' pensions.

income stored as assets when the household reached 60. If the husband worked as a production worker in manufacturing full time, he could earn \$340 per year [Officer 2009, Table 71, pp. 165-169]. Since full-time (60 hours per week for 50 weeks) seems too optimistic, I take the round figure of \$1,000 as my dividing line between adequate and inadequate wealth accumulation by the household age of 60. At that threshold 33.4 percent of the households had not saved enough by age 60. This is likely to be an overestimate of the number households who had not followed a saving strategy. Some households recorded in my sample with little wealth probably had more than they reported. Others failed to report what they owned and thus were estimated to have only \$50 of personal estate. Yet other households may have attempted to follow a life-cycle strategy but encountered bad luck of one sort or another and thus failed to achieve their goal for target wealth.

An alternative estimate of those failing to follow a life-cycle strategy would be to count the number of older individuals without wealth living in a household of one of the individual's grown children. **Figure 33** displays the percentage of the elderly population (born outside of the south) living with a grown child and with reported wealth of less than \$100. At the ages 50 to 65 these individuals were either following the traditional strategy all along or were unsuccessful in accumulating sufficient resources to finance an independent living. At the very old ages, I am likely overestimating the number of those who followed a traditional strategy since this group probably included some faithful life-cycle savers who simply lived longer than they had reason to expect or who experienced unanticipated bad luck in late life. The average fraction of those 60 and over who were dependent on grown children was about one-third of the population.

Figure 33. Percentage of the Elderly without Wealth Living in the Home of a Grown Child, 1870



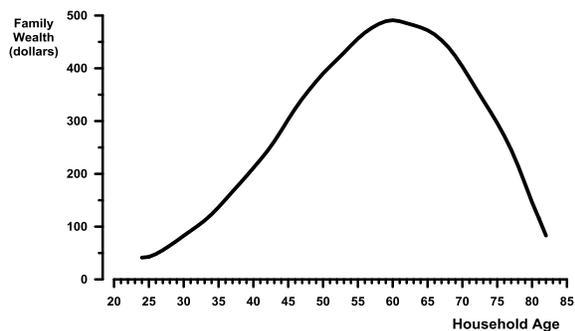
I conclude, then, that at least two-thirds of elderly Americans (excluding those born in the slave states) had sufficient wealth to have been successful life-cycle savers. Studies undertaken with late twentieth century data suggest that between 20 and 30 percent of the population were

not accumulating sufficient wealth to be classified as successful life-cycle savers [Diamond and Hausman 1984]. One might conclude that these people were relying on the traditional strategy, suffered from lack of self-control, or lacked the capacity to plan ahead [Thaler 1994].

Perhaps some of them thought they were “too poor” to save. A decision that one is too poor to save, of course, merely postpones the inevitable. Sooner or later the situation will have to improve or the household will become dependent when it is too old to earn income. This dilemma brings up the possibility that the poverty will reproduce itself in the next generation. The parents, too poor to save, may put their children to work to supplement the household income. At work, rather than in school, the children will reach adulthood with limited skills and thus limited earning capacity. They may then face the additional burden of having to support their aged parents who would otherwise be destitute. The parent’s poverty is replicated in their children’s subsequent poverty. A vicious dynamic like this is difficult to examine with cross sectional data. I might note however that households with low wealth, those in the bottom quartile of the wealth distribution, were two to three times more likely to have an illiterate household head.

My rough dividing line between adequate and inadequate wealth at age 60 is \$1,000. At the twenty-fifth percentile the 60-year old family held only about half that number. As is evident in **Figure 34** these families evidently were forced to dissave at a rapid rate. By age 80 their wealth was exhausted.

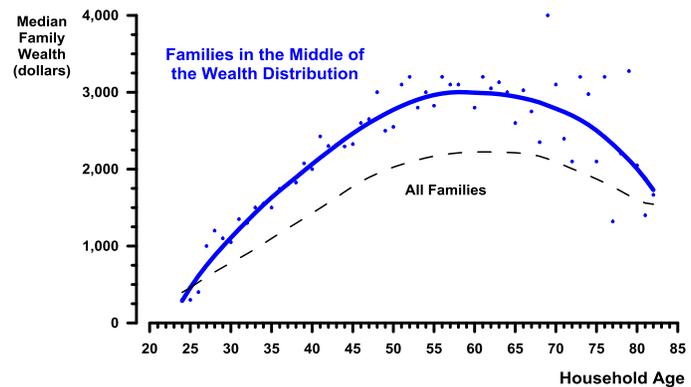
Figure 34. The 25th Percentile of the Wealth Distribution Core Sample, 1870



2.18 The Wealth of the Middle Class Clinch My Conclusion

In order to look more closely and hopefully more clearly at life-cycle savers, I removed the top 10 percent of the wealth distribution at each age (those who were rich for their age) and the bottom 25 percent (those poor for their age). The wealth-age profile for this “middle class” is displayed in **Figure 35**. Modigliani’s signature hump shape is pronounced. The peak is reached at age 58. The median wealth holding of this middle-aged middle-class group reached the equivalent of over 8 years of an industrial worker’s income! I conclude that a majority of Americans were accumulating wealth at levels to sustain them in old age as their incomes fell without the need to rely upon their grown children.

Figure 35. Family Wealth by Household Age, Core Sample excluding the Poor and Rich, 1870



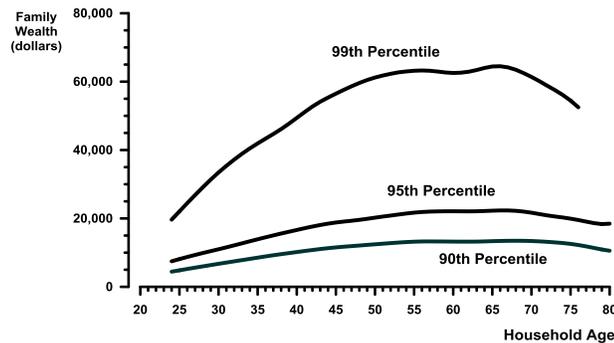
2.19 The Rich Are Always With Us⁸²

At the other end of the wealth spectrum there is a minority of individuals who amass wealth far in excess of what they would need to maintain even a lavish, opulent life style in retirement. **Figure 36** presents the percentile boundaries at the top of the income distribution. The 99th percentile reach over \$60,000 around the age of 60. The top 1 percent reported owning

⁸² “The Rich are Always with Us” was a movie directed by Alfred Green and released in 1932, when Herbert Hoover was President and the economy was stuck near the zero lower bound [see Sutch 2014, BEHL paper, for an economic description of the times]. Based on the novel of the same name by Ethel Pettit [1931], the film starred Ruth Chatterton as the world’s richest woman torn between an unfaithful husband and a would-be lover (George Brent). Everyone involved is portrayed as crazy wealthy, blasé, and entirely untouched by the hardship whirling around them. So the somewhat-disturbing title – a twist on Mathew 26:11, “the poor you have always with you” – became a catch phrase indicating, depending on intonation, either weariness or disgust with the wealth inequalities of the time. The *New York Times* reviewer called the film “mildly diverting,” but he thought the plot and dialogue trite [Hall 1932]. The young Bette Davis had a supporting role; and her performance may be the only reason to seek out this otherwise boring melodrama.

27.7 percent of the wealth recorded by the census. Although lower than estimates of that percentage for the U.S. today, this is still a large number.⁸³ Even as early as 1870 the Gilded Age was notable for its disparities in income and wealth.

Figure 36. Top percentiles of the Wealth Distribution Core Sample, 1870



Yet, it would be inappropriate to directly compare my estimate for the top wealth share with those estimated by Wojciech Kopczuk and Emmanuel Saez from estate tax returns [2004]. Their estimates for the period 1916 to 1929 ranged between 35 and 40 percent. The figures based on the 1870 census measure gross wealth while Kopczuk and Saez refer to net wealth. Since it is likely that most household debt in the Gilded Age was owned by the middleclass in the form of mortgage debt, if we knew those numbers (or made a back-of-the-envelope calculation), it would raise my estimate. For reasons explained in Section 2.7 my figure excludes the data for the former Confederate States. Since the South was home to many very poor ex-slaves, their inclusion would certainly raise my estimate.

There is also the problem of “voluntary top coding.” That would have occurred in 1870 when wealthy respondents either minimized the value of their real and personal asset holdings or who refused to answer the census enumerator’s question. Minimizing one’s wealth might have been the result of an embarrassment of riches that would be particularly acute when addressing the census taker whose own wealth would fall closer to the middle of the distribution.⁸⁴ When a man’s extreme wealth could not be denied, he might have refused an answer because he resented the intrusion of the questioner. “Poor” Cornelius Vanderbilt, at age 76 in 1870, was probably the

⁸³ The Gini coefficient is 0.769. By contrast the Gini for global wealth in 2000 has been estimated to be .802 and for the U.S. the figure is given as .801 [Davies *et al.* 2009: Table 9, p. 45]. The Gini for U.S. net worth in 2010 was .87 [Kenworthy and Smeeding 2013: Table 2.1, p. 27].

⁸⁴ For a modern example, recall that Mitt Romney denied he had inherited money during a primary debate in 2012 [Barbaro, Appelbaum, and Gabriel, *New York Times*, 20 January 2012].

wealthiest man in America at the time, yet Columns 8 and 9 are blank on his census return.⁸⁵ Although doubtless some evaded the estate taxes imposed beginning in 1916, they did so under penalty of law.

One might “solve” the problem of underreporting at the top by (1) imposing an *arbitrary* top code on the assumption that all responses below that figure were accurate and those above it unreliable, (2) *assuming* a specific parameterization for the wealth distribution, (3) fitting that distribution to data from below the specified top code, and then (4) *extrapolating* a replacement for the data in the top tail. However, that procedure may be imposing more structure on the Gilded Age than any historian could accept.

There is also a problem in identifying these super-wealthy as super savers. The census’s wealth measure mixes personal wealth with entrepreneurial wealth. No distinction is made between the assets the respondent might feel free to spend or save as he wished and the value of a business which he owned and managed and was unable to liquidate. Entrepreneurial wealth is held because it is difficult or impossible with many businesses of this era to separate ownership from control. The entrepreneur needed to retain ownership (or a controlling share) of the company with its valuable assets and goodwill in order to continue to be the chief executive. Although he may have thought of his enterprise as “my business,” he actually held those assets “in trust.” At his death they remained intact and the leadership of the enterprise passed to a new CEO. That person might be a relative, but often was not. In either case, the need to hold entrepreneurial wealth is a motive for ownership other than life-cycle requirements or the desire to leave a bequest to heirs or for philanthropic ends. The necessity of maintaining the integrity of the business meant that there will be some at the top of the wealth distribution whose

⁸⁵ Source Citation: Year: 1870; Census Place: New York Ward 15 District 5 (2nd Enumeration District), New York, New York; Roll: M593_1033; Page: 120B; Image: 244; Family History Library Film: 552532 [Ancestry.com 2009]. Other very wealthy men, for example Leland Stanford, did report. In his case the personal estate was rather precisely reported to be \$8,653,180. Source Citation: Year: 1870; Census Place: Sacramento Ward 5, Sacramento, California; Roll: M593_77; Page: 346B; Image: 691; Family History Library Film: 545576 [Ancestry.com 2009].

entrepreneurial wealth swamped their life-cycle wealth and overwhelmed their bequest wealth. I have examined several of the largest household fortunes captured by the IPUMS one-percent sample. The majority appear to be dominated by wealth tied up in business ownership (details available on request).

The prevalence of entrepreneurial wealth during the Gilded Age does not mean that its possession was benign. The “captains of industry” were powerful men and this was, we are told, an era dominated and defined by rapacious monopolists, staggeringly corrupt public officials, and vulgar conspicuous consumption. And, all the while underneath the glitter of wealth was a large population of working poor who lived in crowded and vile tenements and labored in the employ of Big Business for long hours and inadequate wages.

In Part I I suggested that the propensity to save was widespread among the working-aged, working-class households in the late nineteenth century. In this Part I demonstrated that the wealth distributions of the middle class were consistent with a primary motivation for saving to have been – *contra* Piketty – Modigliani’s life-cycle hypothesis and not consistent with a strong altruistic bequest motive. But I also suggested that there were a minority who held more wealth than can be easily explained by life-cycle motives. I claim that the entrepreneurial motive was likely to explain this. If the illiquid assets tied up in the businesses directly owned were held until death, then the resultant bequest would probably not have been motivated by altruism. I consider it more likely that the owner feared selling the business would put it in the hands of those without the special talent to run the enterprise. With their ego invested in the future success of the business, I speculate that the death-bed bequest was caused by “Pride.” But, if on the other hand some of the very wealthy were motivated by an intention to leave a death-bed bequest, Piketty requires that the volume of such inheritances be sufficiently large to animate his “law of capitalism.” For the nineteenth century, I don’t buy this.

Part III: Inheritance in the Nineteenth Century

From shirt sleeves to shirt sleeves in three generations.

-- American proverb dating from the 1880s⁸⁶

In American usage the saying shirt-sleeves to shirt-sleeves was often evoked to draw a contrast between American attitudes about saving and bequests and the European way. Consider this discussion of inheritance by Elizabeth Bisland writing for the *North American Review* in 1897.

In America it is the custom – very nearly the universal custom – for the parents to spend upon the luxuries and pleasures of the family life the whole income. ... They do not consider it obligatory to leave anything to their children at death. They have used all they could accumulate during their own lifetime – let their children do the same. The results of the system are crystallized in the American saying: “There are but three generations from shirt sleeves to shirt sleeves.” The man who acquires wealth spends what he makes. [p. 39]

To a Frenchman such an existence would seem as uncertain and disturbing as is generally supposed to be that of a person who has built upon the crust of a volcano. [Bisland 1897: 40]

Ms. Bisland is describing parents without the taint of a bequest motive – life-cyclers in short.

And she does not exclude the very, very rich from this characterization:

The average man who earns ten or twenty thousand a year invests none of it. He installs his family in a rented house in the city in winter. Several servants are kept; the children are sent to exclusive schools. All the family dress well, eat rich food, and indulge in costly amusements. In the summer they either travel abroad, live in a hotel at a watering place, or rent again. The man’s whole income is at his disposal to spend every year. None of it is deducted to be safely stored in property. When his daughters marry he expects their husbands to be solely responsible for their future ... When his sons begin their career he looks to them to be self-supporting almost from the first, and not to undertake the responsibilities of a family until they are able to bear such a burden without aid from him [p. 40].

⁸⁶ Of the “millions and millions of books” digitized by Google, the first to contain the phrase “from shirt-sleeves to shirt-sleeves” was published in 1888. The author attributed the saying to a Pittsburgher [Bridge 1888: 117].

In this passage Bisland describes the wealthy man (twenty thousand a year would have been an enormous sum – roughly equivalent to \$600,000 in purchasing power today) giving his children, not money, but a fine education to prepare them to make the best possible life available to them. She approved: “The result of it has been to breed the most precocious, self-reliant, vigorous, irreverent race the earth has yet seen” [p. 38].

The life-cycle hypothesis without an added bequest motive predicts the shirt-sleeve outcome. In that model the household that inherits can be expected to dissipate the windfall, at least if given enough time, through increased consumption. In that simplified world, all end-of-life bequests are the unintended consequence of the benefactor’s uncertainty about the length of his or her life. Because the prudent saver accumulates enough wealth to last to a very old age but typically dies prematurely, bequests are common. In fact they are almost universal, though with magnitudes ranging from pitiful to enormous. So consider the fortunate recipient of an unexpected bequest. I can dream, so, let this fortunate one be me.

Suppose I am a life-cycle saver and my goal is to amass X dollars by the day of my retirement at age 67. I set X to be sufficient to finance my retirement for many years. So I set up a saving plan to reach that goal. Now if my Aunt Ella leaves me a bequest (unexpected by me), then between that point and the day of the day of my retirement I will be in the advantageous position of needing to save less each year (consume more) and still reach my asset goal by age 67. Further suppose that receiving my Aunt's gift does not induce me to change X or my age at retirement, that is I do not plan a more luxurious or longer retirement than the one I had originally intended. If that were so, then on the day of retirement I would have my X to spend down until I die and then I would leave exactly the same unintended bequest as I would have, had I not received the inheritance. In this case, I have spent my inheritance by enjoying a higher consumption during my working life. In this scenario succeeding generations receive no benefit from my inheritance.

Now suppose instead, that I recognize that my Aunt’s money has increased my potential life-time resources. In that case I might decide to increase X – multiplying it by the appropriate gamma – and stick to my plan to retire at 67. I would smooth my consumption over my entire

life and live a bit more luxuriously during retirement than in the first scenario. When I die my unintended bequest would be larger by the factor gamma. So gamma becomes a measure of the relevance of my inheritance to the next generation.⁸⁷

However, since I am a farsighted, hyper-rational, life-cycle saver with a good understanding of demography and no bequest motive, this second scenario would not be appealing. I would know that in all likelihood I will leave a larger unintended bequest than in the first scenario. This is my “Aunt Ella Dilemma.” So what should I do? In the real world, empirical studies suggest that one of three approaches is typically chosen. Some in this fortunate position choose to retire at a younger age. It is possible to calculate (at least with the help of an actuary) what that new retirement age should be (and what my target stock of assets should be at that age) so that the mathematical expectation of my unintended bequest is no bigger than in the first scenario. If this strategy is successful then I will have reaped an additional benefit from my inheritance by engaging in more non-employment and less work.

The second approach amounts to following a “glide path” during retirement. This is much more common. With this heuristic I monitor my portfolio after I retire at the originally-planned age of 67. If things seem to be going well – no big medical shocks or other setbacks – then a splurge or two might be allowed. I might host lavish parties, take a cruise, take flying lessons. If my luck holds I will have spent some of my inheritance in Gatsby-like consumption. If not, the inheritance is lost in paying the unexpected bills. Karen Dynan, Jonathan Skinner, and Stephen Zeldes writing in 2002 (and referring to a now-quaint way to store wealth) expressed it this way:

Wealth is something like traveler's checks: you take them along on vacation "just in case," but odds are they will remain uncashed and available for sundry goods after the journey is complete [p. 274].⁸⁸

⁸⁷ Note though, the size of gamma will depend upon which point in my life I inherit. If I am very young I will be spreading Ella's money over many years and gamma will be smaller than if I inherit at an age close to 67.

⁸⁸ Today the traveler's check has been replaced by the credit or debit card. But the precautionary motive for holding on to wealth late in life remains. If your travel expenses prove unexpectedly large, you will need to draw on your wealth to pay the bill when you return.

The third approach to solving the Aunt Ella Dilemma would remove uncertainty from the problem. To do that, I would purchase an annuity with my Aunt's money. An annuity promises a guaranteed stream of income for life and thus would allow me to consume more or work less. But the annuity, of course, would have no value on the day after my death, so there would be nothing left of the inheritance for me to leave as part of my bequest. I will have shared my inheritance with the insurance company while consuming the annual benefits.⁸⁹ And this strategy does not involve leaving a portion of Aunt Ella's legacy as an unintended bequest.⁹⁰

Ms. Bisland's confident testimony about the lack of bequest motives at the end of the nineteenth century is certainly limited and anecdotal, but such evidence supports the quantitative research efforts offered in Parts I and II. The saving data presented in Part I when arranged by the age of the household suggests that industrial workers of the late nineteenth century engaged in significant life-cycle saving despite their modest incomes. The age-wealth profiles of households presented in Part II display the hump shape that is characteristic of life-cycle accumulations. The popularity of annuitized forms of wealth, such as tontine insurance and company pensions, suggest that bequest motives were absent or weak. Those findings support the conclusion that intended bequests, while perhaps important for the super-rich, did not play a significant role in the wealth accumulation of most people.

⁸⁹ From the 1870s through the 1920s annuitized wealth proved extremely popular when it appeared in the form of tontine insurance or company pensions. Tontine insurance is described in Part I and by Roger Ransom and Richard Sutch [1987]. This nineteenth-century form of life insurance was prohibited by law after 1905. Company pensions spread rapidly thereafter to replace them [Ransom, Sutch, and Williamson 1993]. Another form of (partially) annuitized wealth is homeownership [Hurd 2003: 108-113]. It was after the Civil War that urban Americans became homeowners in large numbers thanks to the ubiquitous Building and Loan Societies that sprang up [Snowden 1997, 2003].

⁹⁰ If annuities were priced to be "actuarially fair" then this third strategy should dominate the others for someone without a bequest motive, without a precautionary motive, and living in a world without inflation [Yaari 1965]. However, modern annuities are expensive (unfair), involve considerable fixed costs for the average consumer, are not indexed against inflation, and are very illiquid [Hurd 2003: 106-107].

For macroeconomic theorists and policy makers this is an important conclusion. It takes the wind out of the tattered sails of “Ricardian equivalence.”⁹¹ According to the life-cycle hypothesis, saving and wealth should respond to institutions like the length of retirement, family size, private and public pension arrangements, and health insurance. Most of these variables would likely have little effect on bequests, though admittedly economists know rather little as to what, other than estate and gift taxation, would have a significant impact on intended bequests. The unimportance of bequests also has an implication for addressing a question that interests Thomas Piketty [2014: Chapter 11].

Piketty’s analysis of the “relative roles of inheritance and saving” is the key to his prediction that the concentration of wealth will metastasize in the twenty-first century. The role of inheritance, he says, is the “crucial issue” and the prediction about the future “terrifies” him [2014: 377, 571]. As a half century of research on the motivations for saving have shown it is devilishly difficult to pin down the relative roles of intentional bequests and life-cycle saving. With reference to the United States, Piketty remarks that the paucity and unreliability of the historical data on inheritance flows is a major obstacle [427]. For the nineteenth century there is no systematic data on inheritance that might provide an overview. But part of the problem, as I see it, is that the issue has been poorly framed.

Piketty like those before him try to answer the question: how much of the current stock of wealth has been inherited? The origin of this question dates from a famous debate between Laurence Kotlikoff and Lawrence Summers [1981] and Franco Modigliani [1988]. Kotlikoff and Summers simulated life-cycle saving and accumulation over the period from 1900 to 1974 and concluded that their simulation (with the parameter values they chose) did not generate sufficient saving to explain the observed levels of saving in the economy. They assumed that the residual – 80

⁹¹ The Ricardian equivalence hypothesis assumes (without evidence) that consumers have altruistic bequest motives and are so forward looking that they internalize their children’s utility as their own. Robert Barro [1974, 1979] has shown in this case that tax changes or deficit spending do not affect consumption, saving, or interest rates. Thus this hypothesis is used as an argument against tax cuts aimed to boost aggregate demand. These policy concerns are, perhaps, less relevant for the nineteenth century, but in the context of the larger debate they help explain the polarized debate about the relevance of the life-cycle hypothesis.

percent of total wealth – must have been generated by saving to satisfy a strong bequest motive. In a vigorous rejoinder Modigliani questioned their assumptions, corrected their calculations, and came to the conclusion that inherited wealth accounted for only 20 percent of the total. Piketty expresses his disquiet over this divergence of estimates:

I was a young student when I discovered this work in the 1990s, and the controversy stunned me: how could such a dramatic disagreement exist between serious economists? [p. 428].

However, it soon became clear that the discrepancy was caused by whether the purchases of consumer durables are treated as saving or consumption, whether the accrued interest on the transfers from parents should be attributed to life-cycle accumulation or the inherited wealth, and whether parental support for children over the age of 18 is classified as consumption by the parents' household or as an *inter vivos* transfer [Modigliani 1988: 26-30, Di Nardi 2004: 745].

Modigliani claimed that his choices on these points were consistent with the life-cycle model and were those conventionally accepted by the profession. Kotlikoff and Summers conceded Modigliani's point about consumer durables. Modigliani repeated the calculation treating consumer durables as saving and using Kotlikoff and Summers' formulas and reported that a large adjustment was required, so large that it raised questions about the plausibility of the simulation technique [Modigliani 1988: 29].

The life-cycle model describes the behavior of an individual after he or she becomes financially independent, leaves the parents' home, and begins employment (or married someone who was employed). Modigliani complained that setting the dividing line between dependency and financial independence at age 18 was arbitrary and had the implication that the consumption of all persons above 18 but still dependent without income is regarded as dissaving [p. 27]. Kotlikoff admitted that 18 was arbitrary but suggested that for many individuals born before 1940 that would be too high and suggested an age like 14 or 16 might be more appropriate [Kotlikoff 1988: 48]. This is despite the evidence that employment rates by males between 14

and 17 were well below fifty percent for the entire period [Ransom and Sutch 1986: Figure 2, p. 12; Carter and Sutch 1996, *Historical Methods*].⁹²

I think it is fair to say that the participants in the original debate agreed to disagree about the appropriate treatment of accrued interest, if any, on inheritances. For that reason, perhaps, Piketty – like several others – came away from the debate unconvinced of the quantitative unimportance of a bequest motive [Bernheim 1991, Laitner and Juster 1996, Masson and Pestieau 1997, and Kopczuk and Lupton 2007]. The continuing debate about which side “won,” suggests that a lack of clarity surrounds the issue.

There is also a danger of assuming the conclusion by the way one makes the calculation. To start off on the right foot, the research plan must clarify some important distinctions. First, only bequeathable wealth can be inherited, so both sides need to agree whether they are interested in the magnitude of inheritances relative to total wealth, which includes Social Security wealth and the value of other annuitized wealth, or just relative to marketable wealth? Next, it is important to distinguish between planned bequests and unintended bequests. The latter are a prediction of the life-cycle model, not the bequest hypothesis. Third, the relative importance of an inheritance will depend upon when during a life it is received. The younger the heir, the smaller impact it will have on his or her wealth at death if he or she follows the life-cycle model and consumes most of the inheritance. But the

⁹² Quite apart from the issues raised in this debate, I would add that Kotlikoff and Summers’s simulations, are seriously misspecified. The retirement estimates they use are built into the age-earnings profiles of the *population* that are in turn the product of age-earnings profiles of *workers* and the age profiles of employment [Kotlikoff and Summers 1981: 716-721]. The work experience rates by age for the early decades of the twentieth century are pegged to the same unreliable gainful occupation rates that Michel Darby used [1979]. Another key ingredient are the age-earnings profiles of workers. Rather surprisingly, Kotlikoff and Summers simply imposed a constant shape. “For the years prior to 1950 ... age-earnings profiles for the year 1955 were used” [p. 719]. Yet the age-earnings profiles of the post-World War II era typically rise monotonically with age. It is generally supposed that this fact reflects the workings of an “internal labor market” that (because of seniority systems, internal job hierarchies, and the use of so-called “efficiency wages”) pays older workers more than their current marginal product while younger workers are underpaid [Lazear 1979 and 1981, Jacoby 1985, and Akerlof and Yellen 1986]. What is perhaps less well known, but nevertheless, well documented, is that the internal labor market and efficiency wages arose in the interwar period [Jacoby 1984 and Ransom, Sutch, and Williamson 1993]. It is simply inappropriate to impose the shape of earnings profiles from the mid-1950s onto workers from the period before World War I, or for that matter before World War II.

younger the heir, the larger would be the inheritance left at death if the proceeds were sequestered and allowed to earn and compound interest for many years. The problem posed here for an empirical approach is that marketable wealth is fungible so its persistence in a portfolio can't be traced. When I pay for my vacation am I using Aunt Ella's money or my self-accumulated life-cycle wealth to pay the bill?

Rather than addressing such points directly, Piketty adopts the framework introduced by Kotlikoff and Summers [Piketty 2010: 73; Piketty, Postel-Vinay, and Rosenthal 2014: 24]. That approach estimates the volume of bequests by observing the distribution of wealth across all age categories and then applying a mortality rate appropriate for each age to estimate the volume of terminal bequests for each age of the decedent. This includes unintended bequests as well as those that derive from a dynastic bequest motive. He then assumes a gap between the age of the decedent and the age of the recipient – 30 years by Kotlikoff and Summer's reckoning. In this way he takes bequests received years ago and inflates them to today by allowing them to grow with interest from the time of receipt. The resulting sum is compared to the current magnitude of the asset holdings of the recipient.

That approach leads to some nonsense. It is perfectly possible that this inflated sum could exceed the recipient's current level of wealth, suggesting more than 100 percent of existing wealth was inherited. That could happen, for example, if the recipient gambled and lost the entire bequest the day after receiving it. It could also happen if he or she had reached a late point in life and had already drawn down most of the assets. The further in the past the bequest was received the larger that sum would appear today. After 35 years the bequest would appear by this measure 8 times as large as when it was received. To deal with this anomaly, Piketty arbitrarily sets the magnitude of the bequest to the level of current wealth in every case where the Kotlikoff-Summers measure exceeds current wealth [Piketty 2014TA: 64, Piketty, Postel-Vinay, and Rosenthal 2014: 24]. If you had received a bequest but die with little or no wealth, Piketty labels all of your wealth as inherited. One might as plausibly assume in this case that all of the wealth was earned. There is no general rule that people should consume their earned wealth before their inherited wealth. Indeed, since money is fungible, it is meaningless to ask whether someone is spending inherited wealth or earned wealth when they draw down a portfolio that

mingles the two. This Piketty-modified K-S measure simply ignores the recipient's agency in shaping his wealth portfolio. Yet, this agency is the key idea behind the life-cycle hypothesis.

Channeling Modigliani I say that the appropriate thought process is to concentrate on a household's life-time resources, which include its permanent life-time income (from both labor and the returns to assets) and any net transfers received (including inheritances). That is the sum that a life-cycle-saving household will work to smooth over the years of life. The ratio of the dollar size of the bequest to the life-time resources is the proper measure of the importance of bequests. Piketty explains why he rejects this way of looking at things: "The Modigliani definition ... is particularly problematic, since it fails to recognize that inherited wealth produces flow returns" [2010: 74]. But, that is not true. Modigliani includes the flow returns along with labor returns in the measure of life-time resources (Modigliani and Brumberg 1954: 82) as Piketty recognizes (but ignores) [2010: 74]. Modigliani is correct. The recipient of the bequest has agency over its disposition. He might consume it all with a big party or by purchasing a Picasso to gift to a local museum. He might invest it wisely and earn high returns, or poorly and earn low returns.

Modigliani argued that when you receive a bequest, your life-time resources are enlarged and you will consume more, spreading out the increment to even out consumption over your remaining life. To do this you will also save more since you will now be saving for a more expansive retirement. Piketty objects: "a Rockefeller with zero lifetime labor income would appear to be a lifecycle saver in Modigliani's definition, as long he does not consume the full return to his inherited wealth, which seems weird to me" [Piketty 2010: 74, quoting Blinder 1988]. But such a designation is consistent with the life-cycle hypothesis; it should not be "puzzling." The Rockefeller heir described *saves* a fraction of his income (in this case the income is entirely a return to wealth) and would leave a bequest at death. This may not be very rational unless this Rockefeller, like his Dad, has a desire to pass on a large fortune to his children. To assume this Rockefeller's behavior makes sense is to assume the conclusion that strong dynastic bequest motives are both universal and economically important. Perhaps we should label the young Rockefeller as "weird," not Modigliani's definition.

Consider someone who receives a small inheritance and continues working because the sum is too small to support his immediate retirement. Despite the small size of the inheritance, this individual will consume more and also save more. However, the fraction of his labor income that needs to be saved to reach his retirement target will be smaller than it would have been had he not received the bequest. The bequest has done some of his life-cycle saving for him.

Finally, consider the “instant rich.” These are people who receive an unexpected windfall that is sufficiently large that when combined with the assets already accumulated it represents a sum large enough to completely finance an immediate retirement at the appropriately higher level of consumption until a ripe old age. The life-cycle hypothesis without a bequest motive would predict the individual would quit his or her day job and retire. If the inherited sum is large enough, the recipient will give gifts to family, friends, and favorite charities. That is what most mega-lottery winners actually do [Carlyle 2012].

Piketty’s Rentier World and American Exceptionalism

One of Thomas Piketty’s many contributions to the current discourse about inequality has been to familiarize participants with the French concept “*rentier*.” This is important since Piketty’s model of wealth and inheritance portrays a future financially and politically dominated by rentier capitalists, super-wealthy heirs and heiresses who do not contribute to society (except to pervert democracy by purchasing legislation, corrupting regulators, and financing the reelection campaigns of pliant legislators). The rentiers of Piketty’s world, for example, own apartment buildings in Paris, live off the rents, and “consume more than their labor income” [Piketty 2010: 77; Piketty, Postel-Viney, and Rosenthal 2014]. Because these buildings are, for all practical purposes, indivisible, the wealth they constitute cannot be consumed piecemeal. It remains intact and in the owner’s portfolio there to be passed to heirs at death. These heirs can assume the rentier role upon inheritance. If the rental income is large enough that the rentier does not work, he or she would have no motive to augment that wealth and thus would save nothing. We might call these “hand-to-mouth rentiers,” well off in income terms but they hold little or no liquid wealth despite owning sizeable quantities of illiquid assets [Kaplan and Violante 2014].

America, however, never had much of a rentier class. So infrequently encountered was the person living on rents in America, he or she is described with the French noun. Most farms and plantations in the nineteenth century were owner occupied and most landlords were part-time landlords (or corporations). The rents landlords received supplemented income from their day jobs. Corporations can live forever and thus don't leave bequests, intended or otherwise.

Americans have long believed in a form of “American exceptionalism” in which the industrial classes were better off than elsewhere. The *Annual Report* of the Bank Commissioners of Massachusetts for 1860 stated this belief at a date preceding the Gilded Age.

It has been claimed to be the tendency of modern civilization to make the rich richer and the poor poorer. However true this may be in countries governed on a different system from our own, it does not seem to be the character of our material development. Whatever of wealth and of the comfort and even luxury which wealth brings, is enjoyed by our people in the aggregate, is shared to a degree which is unknown elsewhere, by all classes of the population [Massachusetts 1861: 155].

Elizabeth Bisland’s colorful depiction of the stark horror a Frenchman feels at observing a life-cycle saver without a bequest motive, however, was written in 1897.

To a Frenchman [the lack of a bequest motive] ... would seem as uncertain and disturbing as is generally supposed to be that of a person who has built upon the crust of a volcano [Bisland 1897: 40].

Piketty’s objection to the life-cycle model is that it “amounts to assuming away the existence of rentiers” [2010: 76-77]. That it does, presumably on the grounds that rentiers owned only a small fraction of the country’s wealth (in 1954) and those that were around typically spent their rents and saved little. Piketty has a different picture. Rentiers in his view amass wealth, their fortunes grow, and that must mean that the rents they receive exceed their consumption. But why should that be? In Piketty’s world it must mean they wish to leave *more than* the income property (those Parisian apartments) to their heirs. Otherwise, they would consume more. If the rentier has no bequest motive their fortunes would not grow.

Part IV. Conclusions

Given the character and quantity of the underlying data we will probably never be able to find a number that would allow us to extend Piketty's estimates of the percentage of wealth owned by the wealthiest 1 percent back to 1870 or in any other year of the nineteenth century. My estimate of 27.7 percent is not directly comparable with the statistics for the early twentieth century offered by Piketty and his collaborators. Guestimates of the true wealth shares for the upper classes achieved by whatever manipulation of the 1870 data would, in any case, not answer the question of how the fortunes of the super wealthy were made. Piketty's "Fundamental Laws of Capitalism" [2014: 52, 166] and his prediction of an increasing maldistribution of wealth rests upon his assumption that most wealth is inherited. For what it is worth, our super-wealthy correspondent from the Gilded Age, Andrew Carnegie, described a different law of capitalism. He thought the wealth was self-made, the consequence of

the exercise of special ability in the merchant and in the manufacturer who has to conduct affairs upon a great scale. That this talent for organization and management is rare among men is proved by the fact that it invariably secures for its possessor enormous rewards, no matter where or under what laws or conditions. ... [S]uch men soon create capital; while, without the special talent required, capital soon takes wings. Such men become interested in firms or corporations using millions; and estimating only simple interest to be made upon the capital invested, it is inevitable that their income must exceed their expenditures, and that they must accumulate wealth. ... It is a law, ... that men possessed of this peculiar talent for affairs, under the free play of economic forces, must, of necessity, soon be in receipt of more revenue than can be judiciously expended upon themselves ... [Carnegie 1889: 655-656].

It would be easy, of course, to dismiss Carnegie's reliance on "special ability" and the economies of scale as self-serving. My approach in this paper is to use the available quantitative data from the Gilded Age to directly assess the relative roles of saving and bequests.

I find ample evidence that life-cycle saving and late-life dissaving were prominent features of the late nineteenth century and that this mechanism was evident for the middle class above the bottom 25 percentile, for the rich, for the very-rich, and (if you trust the data) for the super-rich. There is antidotal evidence that in the late nineteenth century the bequest motive was weak. Whatever the situation in the twenty-first century, I conclude that the Piketty mechanism

cannot explain the increasing wealth concentration in the late-nineteenth century. This suggests that other mechanisms such as unequal access to education and credit, monopoly domination either by combination or collusion, the discovery and patenting of increasing-returns technology, the development of large-scale industry integrated backwards into raw material production and forward into marketing and distribution, and rampant corruption and insider dealing, may have greater importance.

Using too little historical information and neglecting the agency of the inheritor has led to an understating of life-cycle saving and an exaggeration of the importance of end-of-life bequests in this era.

Appendix

Comment on the Twentieth Century Trend in the Percentage of Total Wealth Owned by the Top 1 Percent and the Top 10 Percent – An Exercise in Replication⁹³

Replication by itself is not a panacea for the problems facing scientific verifiability. However, it can provide a useful check on the spread of incorrect results. Therefore, the use of replications should be of interest to many economists, even those not directly involved in the production of empirical research.

Maren Duvendack,
Richard W. Palmer-Jones,
and W. Robert Reed [2014: 2]

Piketty uses two basic sources to estimate the distribution of wealth in the twentieth century and up to the present [Piketty 2014: 347]. The estate tax returns filed with the Internal Revenue Service provide information on the wealth at death of those with estates that exceed the exemption level. Less than three percent of estates were taxed throughout the period. The estate tax was introduced in 1916 and despite a number of changes in coverage and marginal rates it has remained part of the tax code ever since. These returns have been used to estimate the percentage of wealth going to the top one-percent of the living annually through the year 2000 by Kopczuk and Saez [2004]. The technique used to estimate the wealth of the living from the wealth of the deceased is the known as the estate multiplier. Each estate tax return is weighted by the inverse probability of death at that age, to obtain an estimate the wealth distribution of the living adult population. In addition to the size distribution of the estates this technique requires the age and sex of the decedent. This procedure assumes that the wealthy experience the same mortality at each age as those in the general population.⁹⁴

⁹³ Piketty is to be praised for making his data publically available and documenting his methodologies. Had he not done so, this replication exercise would not have been possible.

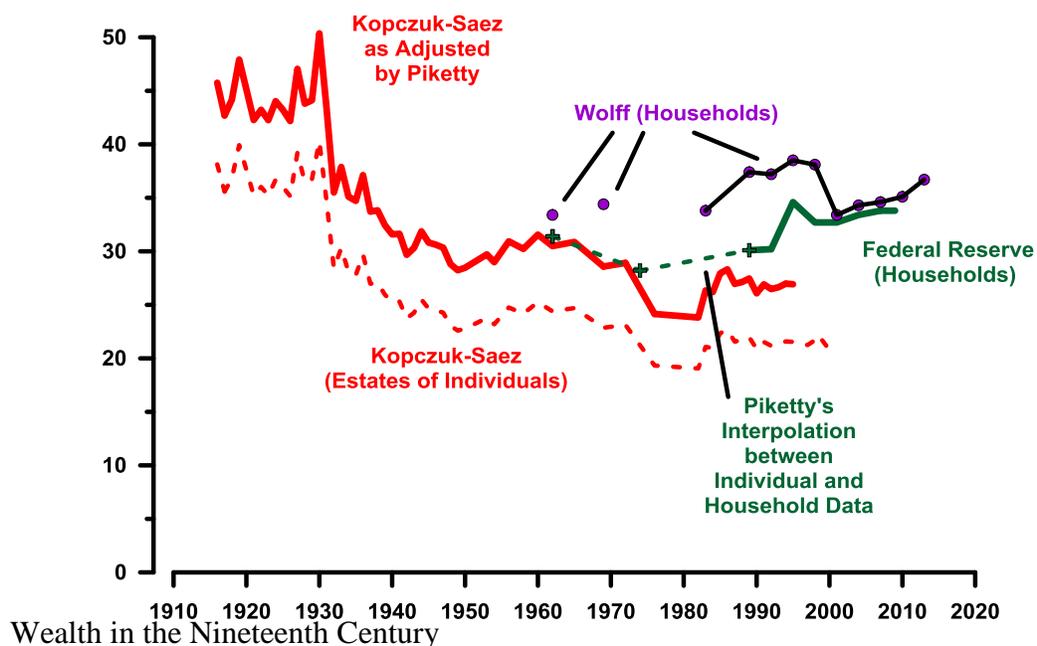
⁹⁴ The pioneers in using U.S. estate tax data were Horst Mendershausen [1956] and Robert Lampman (1962). The estate multiplier technique was introduced by Mendershausen.

The alternative source is the periodic Survey of Consumer Finance (SCF) conducted by the Flow of Funds unit of the Federal Reserve. These surveys include an over sampling of the very rich and have been conducted periodically, including the years 1962, 1969, 1983, 1989, 1992, 1995, 1998, 2001, 2004, 2007, 2009, 2010, and 2013. This source has been used in a series of studies by Edward Wolff who summarizes the results in recent articles [Wolff 2012, 2014]. The SCF data have been independently used to produce an alternative series for 1989 through 2009 by Flow of Funds staff researchers [Kennickell 2009; Bricker et al 2011]. Both data sets are imperfect as a measure of the concentration of wealth [Kopczuk 2014], but one important point to note is the estate tax returns reflect the wealth of individuals while the SCF covers spending units, which are defined to include all individuals living in a households who pool their resources.

The Wealth Share of the Top 1 Percent

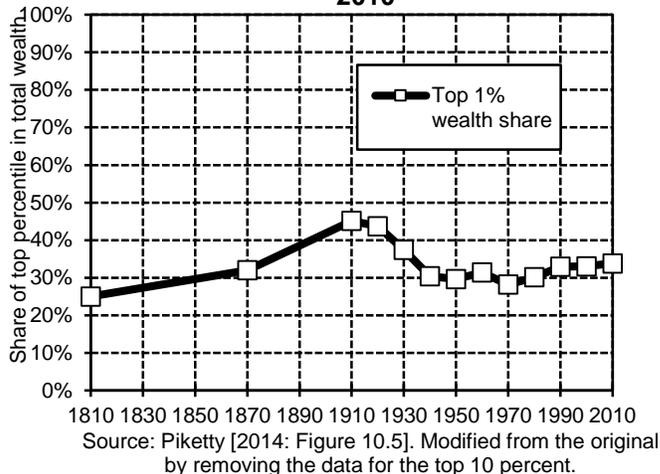
By aggregating the assets owned individually by the household members, the SCF measure of the wealth owned by the top 1 percent of spending units will exceed the proportion owned by the richest 1 percent of individuals. The relationship between the two measures can be seen in the Figure A.1. The dashed red line for the period 1916 to 2000 is the measure estimated for individuals from the estate data [Kopczuk and Saez 2004: Table 3, column 2, pp. 454-455]. The

Figure A.1. Percent of Wealth Owned by the Top One Percent



observations indicated by the purple dots are those reported by Wolff for 1962, 1969, and 1983-2013 for households [Wolff 2012: Table 2, p. 50; 2014: Table 2, p. 50]. The alternative SCF series reported by the Federal Reserve is plotted with the solid green line for 1989 through 2007 [Kennickell 2009: Table 4, p. 35]. These lines plot the raw data employed by Piketty to produce the chart he publishes as Figure 10.5 and which I reproduce here as Figure A.2. To arrive at the

Figure A.2. Wealth inequality in the U.S., 1810-2010



smooth version he presents, Piketty made several adjustments to the data. First Piketty had to reconcile the differences between the estate data and the survey data. Since he feels that the SCF data is more reliable than the estate data he chose to adjust the Kopczuk-Saez upward to link with the SCF data and then to switch from the adjusted estate data to the SCF data at the earliest

possible date, 1962. Kopczuk and Saez warn in this context that “patching together data from different sources is a perilous exercise” [2004: 479]. However, characteristic of his bold approach to the topic, Piketty has done exactly that in a process he describes as “homogenization” [Piketty, “Technical Appendix,” 2014: 56-58]. For the years 1916 through 1929 he inflated the estimates of Kopczuk-Saez by a factor of 1.2 to obtain an estimate comparable to the SCF series. For the years 1930 through 1959 the multiplier he uses is 1.25. That procedure produces the solid red line in my figure. For illustrative purposes I have continued to use the 1.25 multiplier to inflate the estate data from 1960 through 1995.

The first data point available that is based on an SCF survey is for 1962. As reported by Edward Wolff the top 1 percent held 33.4 percent of the total that year [Wolff 1994: Table 4, p.153; and Wolff 2014: Table 2, p. 50]. Without explanation Piketty adjusted this downward to 31.4 by subtracting 2 percentage points. Piketty’s adjusted number is represented by the green cross plotted for 1962 in Figure A.1. Chris Giles, a reporter for the *Financial Times*, described

this procedure as “seemingly arbitrary” [Giles 2014].⁹⁵ In a response to Giles, Piketty did not explain this adjustment [Piketty 2014 “Addendum”].

There is a bit of a mystery where the 1.2 and 1.25 multipliers used to adjust the Kopczuk-Saez upwards come from. The spreadsheet that generated the data (TS10.1DetailsUS) suggests that Piketty was influenced in this choice by the inflation factor of 1.29 that would be required to bring the solid red line up to reach his adjusted SCF estimate for 1962. And, in any case, Piketty does not explain why the adjustment multiplier jumps from 1.2 to 1.25 in 1930. Because there were no SCF surveys taken in the 1970s, Piketty interpolated a number for 1974 (28.2 percent) designed to lie close to the red line in my figure (second green cross).⁹⁶ He then interpolated across the 1980s between his interpolated estimate for 1974 and the Federal Reserve’s observation for 1989, 30.1 percent [Kennickell 2009: Table 4, p. 35]. He then follows the Federal Reserve’s data through 2007. Why he preferred the Federal Reserve’s series to Wolff’s for the years after 1962 also remains unexplained.

This procedure is not only a perilous exercise but it has the effect of obscuring the rapid increase in the concentration of wealth that took place between 1982, when the estate data recorded its lowest point, and the late 1980s. There was, according to Kopczuk and Saez, a twenty percent increase the proportion of wealth owned by the top 1 percent. I suspect that this reflects both the increase in the stock market and the sharp reduction in the marginal rates of income taxation for the wealthy introduced by the Reagan administration.⁹⁷ Wolff’s estimate for 1989 based on the SCF is 37.4 percent, which is considerably higher than Piketty’s interpolation for that date, 30.1 percent [Wolff 2010: Table 2, p.44; and Kennickell 2009, Table

⁹⁵ Phillip Magness and Robert P. Murphy who independently called attention to these problems called the display of the trends in U.S. wealth distribution in Piketty’s Figure 10.5 “a Frankenstein graph, assembled from bits and pieces of the secondary literature” [2015].

⁹⁶ Chris Giles describes Piketty’s procedure, which uses a different source of data as an interpolator, as “odd” and suggested that it “is possibly a simple excel problem.” There is the popular saying: “There are two kinds of people in the world, those who can extrapolate from incomplete data.”

⁹⁷ Stock market averages can be found in Carter *et al.* [2006: Table Cj797-807]. The top marginal tax rate was slashed in a series of steps from 70 percent in 1981 to 28 percent in 1988 [Carter *et al.* 2006: Series Ea826].

4, p.35]. That represents a 57-percent increase in the concentration of wealth over the Reagan years when compared to Piketty's adjusted figure of 23.8 percent for 1982.

The final step in Piketty's effort to chart the twentieth century trend for the top 1 percent's share of wealth was to smooth the raw data by plotting only decadal averages. The value plotted for 1920, for example, is the average of the adjusted Kopczuk-Saez data for the 1920s.⁹⁸ This technique averages out the dramatic spike in the share of wealth owned by the one-percent that occurred during the last half of the 1920s and then reached an all-time high in 1930 of over 50 percent.⁹⁹ Some of this rise can be explained by the fact that the markets placed a high value on the financial holdings of the rich before the Great Stock Market Crash of 1929-1933. But this was also a period in which the tax rates on the rich were dramatically lowered.¹⁰⁰

As emphasized in the body of this paper Piketty's nineteenth-century data for the top 1 percent are basically absent. He has only one real data point, that for 1870. It is based on Lee Soltow's sample of the 1870 Census of Wealth reported by Peter Lindert and Carole Shammas [Soltow 1975; Lindert 2000: Table 3, p. 188; Shammas 1993: Table 1, p. 417]. Soltow's figure of 27 percent was for the top 1 percent of individuals. Piketty inflated this to 32 percent presumably to convert total assets owned by the top *individuals* to net worth owned by the top *households*. My guess is that he simply multiplied the 27 by 1.2, which is the same multiplier he used to make such a conversion on the estate-derived data for 1916-1929.

⁹⁸ For the record it is noted that only the decades for the 1920s, 1930s, and the 1940s, have an observation for all ten years. The data for 1910 is the average for 1916-1919. The decades of the 1960s, 1980s, and 2010s are represented by a single observation each, for 1962, 1989, and 2007. Incidentally, the spreadsheet indicates that the figure for 1989 should have been calculated as an average of Wolff's figure for 1983, 33.8, and Kinnickell's figure for 1989, but the data plotted is actually based on the 1989 data alone, 30.1.

⁹⁹ The fact that Piketty's adjustment multiplier changed from 1.2 to 1.25 between 1929 and 1930 probably exaggerates the peak in 1930.

¹⁰⁰ The average tax rate on a taxable income of \$ 1 million fell from 66.3 percent in 1921 to 43 percent in 1924 and then again to 24.1 percent in 1925 [Carter *et al.* 2006: Series Ea772].

The chart Piketty presents, Figure A-2, also plots a point for 1810. It is 25 percent. He cites Lindert (2000) as the source in a recent co-authored paper which appeared after his book was published [Piketty and Zucman 2014: 17]. But Lindert does not give a figure for 1810. Here is my best guess. Piketty started with Alice Hanson Jones' estimate for 1774 for All Households, 16.5, which is found in Lindert [2000: Table 3, p. 188]. He then rounded that off to 17. He then turned his attention to the 1860 free adult males figure for total assets in Lindert (Soltow again) to get an estimate for net worth of a household by applying the ubiquitous 1.2 adjustment multiplier. He then read a figure for 1810 off a straight-line interpolation between 1774 and 1860. Doing that you would get 24.5 which he rounds to 25. This simple interpolation is difficult to accept. Between 1774 and 1810 there was the Revolutionary War which saw the departure of many wealthy United Empire Loyalists, a post-war period of mercantile and shipping prosperity during which some large fortunes were amassed in Philadelphia, Baltimore, New York, and Boston. This was followed by Jefferson's Embargo of 1807 and a recession in 1809. A straight-line interpolation through this turbulent period lacks credibility.

The heavily manipulated data, the lack of clarity about the procedures used to harmonize and average the data, the insufficient documentation, and the spreadsheet errors are annoying but I should emphasize that greater precision about dating and alternative adjustment procedures would probably leave the overall picture of the evolution in the wealth concentration at the top unchanged. To summarize for the period 1916 to the present, the American picture is that inequality generally fell during the interwar period from roughly a 45 percent top wealth share to a 25 percent share and then rose slowly in the immediate postwar period until about 1962 when it reached about 30 percent. It then fell rapidly until reaching its lowest point in 1982, 23 percent. It then rose remarkably rapidly during the 1980s. The concentration has remained relatively stable since then. The Federal Reserve data, which Piketty prefers, shows a modest increase between 1990 and 2010. An alternative series by Edward Wolff, plotted in Figure A.1, shows a modest decline from 1995 through 2001 followed by an increase from 33.4 to 36.7 in 2013.

The Wealth Share of the Top 10 percent

In his rebuttal to critics of his U.S. data, Piketty claims that their adjustments and his errors have made "little impact on the overall long-run pattern, but [he agrees] that this is relatively

uncertain, and that this could have been explained more clearly” [Piketty 2014 “Addendum,” p.7]. When examining the Piketty’s data for the trend of the top 10 percent of the distribution it is more difficult to be forgiving. The first point to make is that Piketty apparently thinks that the trend for the top 10 percent is more reliable than the trend for the top 1 percent. At least in the issue of *Science* for 23 May 23, 2014 he has a coauthored review which presents the data from the book for the top 10 percent but does not present the companion series for the top 1 percent [Piketty and Saez 2014: Figure 2, p. 839]. It reproduces the data from Figure 10.6 from the book except it drops the point for 1810, but it now inexplicably adds a point for 1890 that isn't in the book version. This appears to be a linear interpolation between 1870 and 1910.

For 1870 he reports Soltow’s number taken from Lindert, 70 percent, but without applying the 1.2 multiplier that he used on the top 1 percent wealth share, which consistency suggests he should have. Had he done so, his 1870 figure would be 84 percent of the wealth in the hands of the top 10 percent. But that higher figure would imply a fall in the wealth share between 1870 and 1910. So much for the “well-established fact that wealth in the United States became increasingly concentrated over the course of the nineteenth century” [Piketty 2014: 347].

As noted by Chris Giles all the data for 1910 through 1950 and for 1970 was obtained by simply adding 36 points to the data for the top 1 percent wealth share. The data point for 1960 added 35.6 points without explanation, but strangely the 35.6-point adjustment is expressed as $33.6 + 2$. Neither the 36-point adjustment nor the 35.6-point adjustment is explained. The constancy of this markup is questionable. Note that the gap between his 1- and ten-percent shares for the 1870 numbers is 38 points.

For 1980 Piketty reported that he averaged the 1983 figure from Wolff [1994] with the 1989 figure from Kennickell [2009]. Had he done that, the number would be 67.7, but he reports 67.2 (which is the 1989 figure unaveraged). For 1990 he claims to average three figures from Kennickell [2001] for the years 1992, 1995, and 1998. But actually he used Kennickell [2009]. The procedure claimed should have given him 67.8, but he reports 68.7 (a typo?). For 2000 he claims that he averaged Kennickell's values for 2001 and 2004. He again misreports the source as Kennickell [2001] when he actually used Kennickell [2009]. For 2010 he claims to be using

an average of 2007 and 2009, but he reports the number for 2007 because he has no data for 2009 [Brickel et al. 2011].

The caption to the figure in *Science* says that the numbers are constructed from inheritance tax records, but that is only true for the data 1910-1950. This cavalier handling of the data and his sources on the top 10 percent, may not be a fatal flaw but it is certainly unfortunate. It seems to me that the sloppiness here resulted in a self-inflicted wound. It raises doubts about the care that the author has taken with his evidence. It gives partisan critics an excuse to ignore his concerns and policy proposals.

References

- Achenbaum, W. Andrew (1978). *Old Age in the New Land: The American Experience since 1790*, Johns Hopkins University Press, 1978.
- Adams, John R. (1977). *Edward Everett Hale*, Twayne Publishers, 1977.
- Akerlof, George A., and Janet L. Yellen, editors (1986). *Efficiency Wage Models of the Labor Market*. Cambridge University Press, 1986.
- Ancestry.com (2009). *1870 United States Federal Census* [database on-line]. Ancestry.com Operations, Inc., 2009.
- Anderson, Margo J. (1988). *The American Census: A Social History*, Yale University Press, 1988.
- Anonymous, (1894). "Typhoid Fever Among Plumbers," *Journal of the American Medical Association* 23 (18) 1894: 691.
- Attanasio, Orazio P. (1994). "Personal Saving in the United States," Chapter 2 in James M. Poterba, editor, *International Comparisons of Household Saving*, University of Chicago Press, 1994: 57-123.
- Attanasio, Orazio, and Hillary Williamson Hoynes (2000). "Differential Mortality and Wealth Accumulation," *Journal of Human Resources* 35 (1) Winter 2000: 1-29.
- Barbaro, Michael; Binyamin Appelbaum; and Trip Gabriel (2012). "Romney and His Money," *New York Times* 20 January 2012.
- Barro, Robert J. (1974). "Are Government Bonds Net Wealth?" *Journal of Political Economy* 82 (6): 1095–1117.
- Barro, Robert J. (1979). "On the Determination of the Public Debt," *Journal of Political Economy* 87 (5): 940–971.
- Becker, Gary S. (1974). "A Theory of Social Interactions," *Journal of Political Economy* 82 (6) November-December 1974: 1063-1093.
- Berger, Victor L. (1929). *Voice and Pen of Victor L. Berger: Congressional Speeches and Editorials*, Milwaukee Leader, 1929.
- Berkshire Eagle, advertisement by City Savings Bank of Pittsfield (1952). "Save Money When You Need it Least," *Berkshire Eagle* [Pittsfield, Massachusetts], 27 February 1952: 19.
- Bernheim, B. Douglas (1991). "How Strong Are Bequest Motives? Evidence Based on Estimates of the Demand for Life Insurance and Annuities," *Journal of Political Economy* 99 (5) October 1991: 899-927.
- Bisland, Elizabeth (1897). "Are American Parents Selfish?" *North American Review* 165 (488) July 1897: 37-42.
- Blinder, Alan (1988). "Comments on Modigliani and Kotlikoff-Summers," in *Modelling the Accumulation and Distribution of Wealth*, D. Kessler & A. Masson eds., Oxford University Press, 1988: 68-76.

- Bricker, Jesse; Brian K. Bucks; Arthur Kennickell; Traci L. Mach; and Kevin Moore (2011). "Drowning or Weathering the Storm? Changes in Family Finances from 2007 to 2009," *National Bureau of Economic Research Working Paper* 16985, April 2011.
- Bridge, James Howard (1888). *Uncle Sam at Home*, Henry Holt, 1888.
- Budd, Louis J, editor (1992). *Mark Twain: Collected Tales, Sketches, Speeches, & Essays, 1852-1890*, Library of America, 1992.
- Carlyle, Erin (2012). "11 Biggest Lottery Winners Ever: How They Planned to Spend the Money," *Forbes* [on line blog], Updated November 27, 2012, downloaded May 4, 2014 from <http://www.forbes.com/sites/erincarlyle/2012/03/30/ten-biggest-lottery-winners-ever-how-they-planned-to-spend-the-money/>
- Carnegie, Andrew (1889). "The Best Fields for Philanthropy," *North American Review* 149 (396) December 1889: 682-698.
- Carnegie, Andrew (1889). "Wealth," *North American Review* 148 (391) June 1889: 653-664.
- Carnegie, Andrew (1900). *The Gospel of Wealth, and other Timely Essays*. New York: Century Co., 1900.
- Carroll, Christopher D. (2000). "Why Do the Rich Save So Much?" In Joel B. Slemrod, editor, *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*, Harvard University Press, 2000.
- Carroll, Christopher D. (2002). "Portfolios of the Rich," Chapter 10 in Luigi Guiso, Michael Haliassos, and Tullio Jappelli, editors, *Household Portfolios*, MIT Press, 2002: 389-429.
- Carter, Susan B., and Richard Sutch (1996). "Fixing the Facts: Editing of the 1880 U.S. Census of Occupations with Implications for Long-Term Labor-Force Trends and the Sociology of Official Statistics," *Historical Methods* 29 (1) Winter 1996: 5-24.
- Carter, Susan B., and Richard Sutch (1996). "Myth of the Industrial Scrap Heap: A Revisionist View of Turn-of-the-Century American Retirement," *Journal of Economic History* 56 (1) March 1996: 5-38.
- Carter, Susan B.; Roger L. Ransom; and Richard Sutch (1991), "The Historical Labor Statistics Project at the University of California," *Historical Methods* 24 (2) Spring 1991: 52-65.
- Carter, Susan B.; Roger L. Ransom; and Richard Sutch (2004). "Family Matters: The Life-Cycle Transition and the Antebellum American Fertility Decline," Chapter 11 in Timothy W. Guinnane, William A. Sundstrom, and Warren Whatley, editors, *History Matters: Essays on Economic Growth, Technology, and Demographic Change*, Stanford University Press, 2004: 271-327.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Survey of 549 Farmers in Wisconsin, 1895; Reported in the Seventh Biennial Report of the Wisconsin Bureau of Labor, Census and Industrial Statistics: Codebook and User's Manual*, Historical Labor Statistics Project Codebook WI107A, University of California, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,165 Workers in Kansas, 1884-1887; Reported in the First, Second, and Third Annual Reports of the Kansas Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook KS1-3*, Institute of Business and Economic Research, University of California, Berkeley, January 18, 1993.

- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 514 Male Wage-Earners in Kansas, 1895; Reported in the Eleventh Annual Report of the Kansas Bureau of Labor and Industry, Historical Labor Statistics Project Codebook KS11*, Institute of Business and Economic Research, University of California, Berkeley, May 6, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 539 Wage-Earners in Kansas, 1896; Reported in the Eleventh Annual Report of the Kansas Bureau of Labor and Industry, Historical Labor Statistics Project Codebook KS12*, Institute of Business and Economic Research, University of California, Berkeley, May 7, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,204 Wage-Earners in Kansas, 1897; Reported in the Thirteenth Annual Report of the Kansas Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook KS13*, Institute of Business and Economic Research, University of California, Berkeley, May 8, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,058 Wage-Earners in Kansas, 1899; Reported in the Fifteenth Annual Report of the Kansas Bureau of Labor and Industry, Historical Labor Statistics Project Codebook KS15*, Institute of Business and Economic Research, University of California, Berkeley, May 10, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 3,920 Male Workers in the Agricultural Implement and Iron Industries in Detroit, 1890; Reported in the Eighth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI08A*, Institute of Business and Economic Research, University of California, Berkeley, June 1, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 4,918 Male Workers in the Agricultural Implement and Iron Industries in Michigan Outside of Detroit, 1890; Reported in the Eighth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI08B*, Institute of Business and Economic Research, University of California, Berkeley, June 2, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,200 Employees of Street Railways in Michigan, 1895; Reported in the Thirteenth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI13C*, Institute of Business and Economic Research, University of California, Berkeley, July 5, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,490 Mechanics' and Workingmen's Returns in Wisconsin, 1895; Reported in the Seventh Biennial Report of the Wisconsin Bureau of Labor, Census, and Industrial Statistics, Historical Labor Statistics Project Codebook WI07B*, Institute of Business and Economic Research, University of California, Berkeley, July 14, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,084 Workers in Maine, 1890; Reported in the Fifth Annual Report of the Maine Bureau of Industrial and Labor Statistics, Historical Labor Statistics Project Codebook ME05*, Institute of Business and Economic Research, University of California, Berkeley, May 22, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 259 Wage-Workers in Missouri, 1891; Reported in the Fourteenth Annual Report of the Missouri Bureau of Labor Statistics and Inspection, Historical Labor Statistics Project Codebook MO14*, Institute of Business and Economic Research, University of California, Berkeley, July 7, 1993.

- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 6,051 Male Railway Employees in Michigan, 1893; Reported in the Eleventh Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI11*, Institute of Business and Economic Research, University of California, Berkeley, June 13, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 5,419 Workers in the Furniture Industry of Michigan, 1889; Reported in the Seventh Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI07*, Institute of Business and Economic Research, University of California, Berkeley, June 3, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 719 Stone Workers in Michigan, 1888; Reported in the Sixth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI06*, Institute of Business and Economic Research, University of California, Berkeley, May 25, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 5,600 Farm Laborers in Michigan, 1894; Reported in the Twelfth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI12B*, Institute of Business and Economic Research, University of California, Berkeley, June 29, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,950 Employees of Hack and Bus Lines in Michigan, 1895; Reported in the Thirteenth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI13A*, Institute of Business and Economic Research, University of California, Berkeley, July 3, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,250 Owners of Hacks, Drays, Buses, Etc. Who drive their Own Teams in Michigan, 1895; Reported in the Thirteenth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI13B*, Institute of Business and Economic Research, University of California, Berkeley, July 5, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,200 Employees of Street Railways in Michigan, 1895; Reported in the Thirteenth Annual Report of the Michigan Bureau of Labor and Industrial Statistics*, with. *Historical Labor Statistics Project Codebook MI13C*, Berkeley: Institute of Business and Economic Research, July 1993.
- Carter, Susan B.; Scott Sigmund Gartner; Michael R. Haines; Alan L. Olmstead; Richard Sutch; and Gavin Wright, editors (2006). *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, five volumes, Cambridge University Press, 2006.
- Clemens, Samuel L. See Mark Twain.
- Coale, Ansley J., and Melvin Zelnik (1963). *New Estimates of Fertility and Population in the United States: A Study of Annual White Births from 1855 to 1960 and of Completeness of Enumeration in the Censuses from 1880 to 1960*, Princeton University Press, 1963.
- Cohen, Leonard, and Sharon Robinson (1988). "Everybody Knows," song lyrics, Sony/ATV Music Publishing LLC, Universal Music Publishing Group, February 1988.
- Costa, Dora L. (1998). *The Evolution of Retirement: An American Economic History, 1880-1990*, University of Chicago Press, 1998.

- Danziger, Sheldon; Jacques van der Gaag; Eugene Smolensky; and Michael Taussig (1982). "The Life Cycle Hypothesis and the Consumption Behavior of the Elderly," *Journal of Post Keynesian Economics* 5 (2) Winter 1982-1983: 208-227.
- Darby, Michael R. (1979). *The Effects of Social Security on Income and the Capital Stock*, American Enterprise Institute for Public Policy Research, 1979.
- Das, Anupreeta; Mike Esterl; and Joann S. Lublin (2014) "Buffett Pressures Coca-Cola Over Executive Pay: Coke Rethinks Awards After Objections From Chief of Berkshire Hathaway, which Holds Coca-Cola Shares," *Wall Street Journal*, updated April 30, 2014, downloaded May 23, 2014 from http://online.wsj.com/news/articles/SB10001424052702303948104579534213589301296?mod=Business_newsreel_3
- Davies, James B.; Susanna Sandström; Anthony B. Shorrocks; and Edward N. Wolff (2009). "The Level and Distribution Of Global Household Wealth," *National Bureau of Economic Research Working Paper*, number15508, November 2009.
- DeLong, J. Bradford (2003). "A History of Bequests in the United States," Chapter 2 in Alicia H. Munnell and Annika Sundén, editors, *Death and Dollars: The Role of Gifts and Bequests in America*, Brookings Institution Press, 2003: 33-53.
- Di Matteo, Livio (1997). "The Determinants of Wealth and Asset Holding in Nineteenth Century Canada: Evidence from Micro-data," *Journal of Economic History* 57 (4) December 1997: 907-934.
- Di Matteo, Livio (1998). "Wealth Accumulation and the Life-Cycle in Economic History: Implications of Alternative Approaches to Data," *Explorations in Economic History* 35 (3) July 1998: 296-324.
- Di Nardi, Mariacristina (2004). "Wealth Inequality and Intergenerational Links," *Review of Economic Studies* 71() month 2004: 743-768.
- Diamond, P[eter] A., and J[ames] A. Hausman (1984). "Individual Retirement and Savings Behavior," *Journal of Public Economics* 23 (1-2) February-March 1984: 81-114.
- Dillon, Lisa; Brian Gratton; Jon Moen (2010). "Retirement at the Turn of the Twentieth Century: A Canadian Perspective," *Canadian Historical Review* 91 (1) March 2010: 27-59.
- Duesenberry, James S. (1949). *Income, Saving and the Theory of Consumer Behavior*, Harvard University Press, 1949.
- Durand, John D. (1948). *The Labor Force in the United States, 1890-1960*. Social Science Research Council, 1948.
- Durand, John D., and Edwin Goldfield (1944). U.S. Bureau of the Census, Sixteenth Census, 1940. Population: Estimates of the Labor Force, Employment, and Unemployment in the United States, 1940 and 1930, U.S. Government Printing Office, 1944.
- Duvendack, Maren; Richard W. Palmer-Jones; and W. Robert Reed (2014). "Replications in Economics: A Progress Report," *Department of Economics and Finance Working Paper* Number 26/2014, University of Canterbury, Christchurch, New Zealand, December 3, 2014.
- Dynan, Karen E., Johnathan Skinner, and Stephen P. Zeldes (2002). "The Importance of Bequests and Life- Cycle Saving in Capital Accumulation: A New Answer," *American Economic Review* 92 (2) May 2002: 274-278.

- Dynan, Karen E., Johnathan Skinner, and Stephen P. Zeldes (2004). "Do the Rich Save More?" *Journal of Political Economy* 112 (2) April 2004: 397-444.
- Eichengreen, Barry (1984). "Mortgage Interest Rates in the Populist Era," *American Economic Review* 74 (5) December 1984): 995-1015.
- Eli, Shari (2015). ""Income Effects on Health: Evidence from Union Army Pensions," *Journal of Economic History*, forthcoming.
- Fan, C. Simon (2006). "Do the Rich Save More? A New View Based on Intergenerational Transfers," *Southern Economic Journal* 73 (2) October 2006: 362-373.
- Field, Alexander [2014]. "Capital in the Twenty-First Century: A Review Essay," *Journal of Economic History* 74 (3) September 2014: 916-920.
- Filer, Randall, and Peter A. Petri (1988). "A Job-Characteristics Theory of Retirement," *Review of Economics and Statistics* 70 (1) February 1988: 123-128.
- Fischer, David Hackett (1978). *Growing Old in America*, expanded edition, Oxford University Press, 1978.
- Fisher, Irving (1912). *Elementary Principles of Economics*, Macmillan, 1912.
- Fisher, Irving (1919). "Economists in Public Service: Annual Address of the President," *American Economic Review* 9 (1, Supplement) March 1919: 5-21.
- Friedman, Milton (1957). *A Theory of the Consumption Function*, Princeton University Press, 1957.
- Gallman, Robert E. (1960). "Commodity Output, 1839-1899," William N. Parker, editor, *Trends in the American Economy in the Nineteenth Century*, National Bureau of Economic Research, Princeton University Press, 1960: 13-71.
- Gallman, Robert E. (1966). "Gross National Product in the United States, 1834-1909." In Dorothy S. Brady, editor, *Output, Employment, and Productivity in the United States after 1800*, National Bureau of Economic Research, Conference in Research on Income and Wealth, Studies in Income and Wealth, volume 30, Columbia University Press, 1966: 3-90.
- Gallman, Robert E. (1969). "Trends in the Size Distribution of Wealth in the Nineteenth Century: Some Speculations," Chapter 1 in Lee Soltow, editor, *Six Papers on the Size Distribution of Wealth and Income*, National Bureau of Economic Research, 1969: 1-30.
- Giles, Chris (2014). "Data problems with *Capital in the 21st Century*," Blog posted by the *Financial Times*, 23 May 2014.
- Goldin, Claudia Dale, and Frank Lewis (1975). "The Economic Costs of the American Civil War: Estimates and Implications," *Journal of Economic History* 35 (2) June 1975: 299-326.
- Goodman, Ellen (1985). "Nobel Winner's Idea Is Piggy Bank Fodder," *Chicago Tribune*, October 18, 1985.
- Gordon, Max (1941). "Victor Berger, Socialist Persuader in Congress," Master of Arts Dissertation, University of Wisconsin, Madison, 1941.

- Graebner, William (1980). *A History of Retirement: The Meaning and Function of An American Institution, 1885-1978*, Yale University Press, 1980.
- Gratton, Brian (1986). *Urban Elders: Family, Work, and Welfare among Boston's Aged, 1890-1950*, Temple University Press, 1986.
- Haber, Carole (1983). *Beyond Sixty-Five: The Dilemma of Old Age in America's Past*, Cambridge University Press, 1983.
- Hacker, J. David (2011). "A Census-Based Count of the Civil War Dead," *Civil War History* 57 (4) December 2011: 307-348.
- Haines, Michael R. (1998). "Estimated Life Tables for the United States, 1850-1910," *Historical Methods* 31 (4) 1998: 149-169.
- Haines, Michael R., and Allen C. Goodman (1992). "Housing Demand in the United States in the Late Nineteenth Century: Evidence from the Commissioner of Labor Survey, 1889/1890," *Journal of Urban Economics* 31 (1) January 1992: 99-122.
- Haines, Michael R.; Mathew Jaremski; and J. David Hacker (2014). "Banks, Life Cycle Saving, and the American Fertility Transition, 1800-1880," revised version of a paper presented at the Annual Meetings of the Social Science History Association, Chicago, November 2013, January 2014.
- Hale, Edward Everett (1903). "Old Age Pensions," *Cosmopolitan* 35, June 1903: 168-172.
- Hall, Mordaunt (1932). "Movie Review of *The Rich Are Always with Us*," *New York Times* 16 May 1932.
- Holden, Karen C. (1988). "Physically Demanding Occupations, Health, and Work After Retirement: Findings From the New Beneficiary Survey," *Social Security Bulletin* 51 (11), September 1988.
- Hurd, Michael D. (1987). "Savings of the Elderly and Desired Bequests," *American Economic Review* 77 (3) June 1987: 298-312.
- Hurd, Michael D. (1989). "Mortality Risk and Bequests," *Econometrica* 57 (4) July 1989: 779-813.
- Hurd, Michael D. (1990). "Research on the Elderly: Economic Status, Retirement, and Consumption and Saving," *Journal of Economic Literature* 28 (2) June 1990: 565-637.
- Hurd, Michael D. (1997). "The Economics of Individual Aging," Chapter 16 in Mark R. Rosenzweig and Oded Stark, editors, *Handbook of Population and Family Economics*, Volume 1B, Elsevier, 1997: 891-966.
- Hurd, Michael D. (2002). "Are Bequests Accidental or Desired?" *RAND Working Paper Series* Number 03-13, Labor and Population Program, RAND Corporation, January 2002.
- Hurd, Michael D. (2003). "Bequests: By Accident or by Design," Chapter 4 in Alicia H. Munnell and Annika Sundén, editors, *Death and Dollars: The Role of Gifts and Bequests in America*, Brookings Institution Press, 2003: 93-118.
- Hurd, Michael D., and B. Gabriela Mundaca (1989). "The Importance of Gifts and Inheritances Among the Affluent," Chapter 14 in Robert E. Lipsey and Helen Stone Tice, editors, *The Measurement of Saving, Investment, and Wealth*, University of Chicago Press, 1989: 737-764.

- Jacoby, Sanford M. (1984). "The Development of Internal Labor Markets in American Manufacturing Firms," In Paul Osterman, editor, *Internal Labor Markets*, MIT Press 1984: 23-69.
- Jacoby, Sanford M. (1985). *Employing Bureaucracy: Managers, Unions, and the Transformation of Work in American Industry, 1900-1945*, Columbia University Press, 1985.
- Jianakoplos, Nancy Ammon; Paul L. Menchik; and F. Owen Irvine (1989). "Using Panel Data to Assess the Bias in Cross-sectional Inferences of Life-Cycle Changes in the Level and Composition of Household Wealth," Chapter 11 in Robert E. Lipsey and Helen Stone Tice, editors, *The Measurement of Saving, Investment and Wealth*, University of Chicago Press: 553-644.
- Kansas, Bureau of Labor and Industrial Statistics (1886). *First Annual Report, January 1, 1886*, Topeka, T.D. Thacher, State Printer, 1886: 10-11.
- Kansas, Bureau of Labor and Industrial Statistics (1887). *Second Annual Report, January 1, 1887*, Topeka, T.D. Thatcher, State Printer, 1887: 307-351.
- Kansas, Bureau of Labor and Industrial Statistics (1888). *Third Annual Report, January 1, 1888*, Topeka: Clifford C. Baker, State Printer, 1888:134-156.
- Kansas, Bureau of Labor and Industrial Statistics (1898). *Thirteenth Annual Report, 1897*, Topeka, J. S. Parks, State Printer, 1898.
- Kansas, Bureau of Labor and Industry (1895). *Eleventh Annual Report, 1895*, Kansas State Printing Company: J. K. Hudson, State Printer, 1896.
- Kansas, Bureau of Labor and Industry (1896). *Twelfth Annual Report, 1896*, Kansas State Printing Company: J. K. Hudson, State Printer, 1897.
- Kansas, Bureau of Labor and Industry (1899). *Fifteenth Annual Report 1899*, W. Y. Morgan, State Printer, 1900.
- Kaplan, Greg; Giovanni L. Violante; and Justin Weidner (2014). "The Wealthy Hand-to-Mouth," *National Bureau of Economic Research Working Paper* Number 20073: April 2014.
- Kennickell, Arthur B. (2001). "Modeling Wealth with Multiple Observations of Income: Redesign of the Sample for the 2001 Survey of Consumer Finance," Board of Governors of the Federal Reserve System, *Survey of Consumer Finance Working Paper*, October 2001.
- Kennickell, Arthur B. (2009). "Ponds and Streams: Wealth and Income in the U.S., 1989 to 2007," Federal Reserve Board, *Staff Working Papers Finance and Economics Discussion Series*, Number 2009-13, January 7, 2009.

- Kenworthy, Lane, and Timothy Smeeding (2013). "Growing Inequalities and Their Impacts In The United States: Country Report for the United States," January 2013 on line at http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCAQFjAA&url=http%3A%2F%2Fgini-research.org%2FCR-United-States&ei=-v6_VOKsHIHtoASZoIGIBQ&usg=AFQjCNFOUJoB1LJPv0VTCTDDOQh7Gx8uw&sig2=9sI9jEob3nPCrAaMtVBpWw&bvm=bv.83829542,d.cGU
- Keynes, John Maynard (1930). "Economic Possibilities for Our Grandchildren," *Nation and Athenæum*, 11 and 18 October 1930, reprinted in *Essays in Persuasion*, W.W. Norton, 1963 (original publication in 1931).
- Keynes, John Maynard (1936). *The General Theory of Employment, Interest, and Money*, Macmillan, 1936.
- Keyssar, Alexander (1986). *Out of Work: The First Century of Unemployment in Massachusetts*, Cambridge University Press, 1986.
- King, M[ervyn] A., and Dicks-Mireaux, L[ouis]-D. L. (1982). "Asset Holdings and the Life-Cycle," *Economic Journal* 92 (366) June 1982: 247-267.
- King, Mervyn A. (1983). "The Economics of Saving," *National Bureau of Economic Research Working Paper*, Number 1247, December 1983.
- King, Mervyn A. (1985). "The Economics of Saving: A Survey of Recent Contributions," Kenneth J. Arrow and Seppo Konkapohja, editors, *Frontiers in Economics*, Basil Blackwell 1985.
- Kopczuk, Wojciech (2014). "What Do We Know About Evolution of Top Wealth Shares in the United States?" *National Bureau of Economic Research Working Paper*, Number 20734, December 2014.
- Kopczuk, Wojciech, and Emmanuel Saez (2004), "Top Wealth Shares in the United States, 1916-2000: Evidence from Estate Tax Returns," *National Tax Journal* 57 (2, Part 2) June 2004: 445-488.
- Kopczuk, Wojciech., and Joseph P. Lupton (2007). "To Leave or Not to Leave: An Empirical Investigation of the Distribution of Bequest Motives," *Review of Economic Studies* 74 (1) January 2007: 207-235.
- Kotlikoff, Laurence J. (1988). "Intergenerational Transfers and Savings," *Journal of Economic Perspectives* 2 (2) Spring 1988: 41-58.
- Kotlikoff, Laurence J., and Lawrence H. Summers (1981). "The Role of Intergenerational Transfers and Life Cycle Saving in Aggregate Capital Accumulation," *Journal of Political Economy* 89 (4) August 1981: 706-732.
- Krugman, Paul (2011). "We Are the 99.9%," *New York Times*, 24 November 2011.
- Krugman, Paul (2014). "Why We're in a New Gilded Age," review essay of Thomas Piketty, *Capital in the Twenty-First Century*" *New York Review of Books*, 8 May 2014.
- Laitner, John, and F. Thomas Juster (1996). "New Evidence on Altruism: A Study of TIAA-CREF Retirees," *American Economic Review* 86 (4) September 1996: 893-908.
- Lampman, Robert J. (1962). *The Share of Top Wealth-Holders in National Wealth, 1922-56*, Princeton University Press: 1962.

- Lazear, Edward P. (1979). "Why is there Mandatory Retirement?" *Journal of Political Economy* 87 (6) December 1979: 1261-1284.
- Lazear, Edward P. (1981). "Agency, Earnings Profiles, Productivity, and Hours Restrictions," *American Economic Review* 71 (4) September 1981: 606-620.
- Lebergott, Stanley (1976). "Review of *Men and Wealth in the United States, 1850-1870* by Lee Soltow," *Journal of Economic History* 36 (3) September 1976: 795-797.
- Lee, Chulhee (1998). "Long-Term Unemployment and Retirement in Early-Twentieth-Century America," *Journal of Economic History* 58 (3) September 1998: 844-856.
- Leff, Nathaniel H. (1969). "Dependency Rates and Savings Rates," *American Economic Review* 59 (5) December 1969: 886-896.
- Leibenstein, Harvey (1975). "The Economic Theory of Fertility Decline," *Quarterly Journal of Economics* 89 (1) February 1975: 1-31.
- Lewis, Frank D. (1983). "Fertility and Savings in the United States: 1830-1900," *Journal of Political Economy* 91 (5) October 1983: 825-840.
- Li, Xiaoyan; Michael Hurd; and David S. Loughran (2008). "The Characteristics of Social Security Beneficiaries Who Claim Benefits at the Early Entitlement Age," *AARP Research Report*, Number 2008-19, AARP Public Policy Institute, November 2008.
- Lindert, Peter H. (2000). "Three Centuries of Inequality in Britain and America," Chapter 3 in Anthony B. Atkinson and François Bourguignon, editors, *Handbook of Income Distribution*, Volume 1, Elsevier, 2000: 167-216.
- Lindert, Peter H. (2000). "When Did Inequality Rise in Britain and America?" *Journal of Income Distribution* 9 July 2000: 11-25.
- Lindert, Peter H. (2014). "Making the Most of *Capital* in the 21st Century," *National Bureau of Economic Research Working Paper* Number 20232, June 2014.
- Long, Clarence D. (1958). *The Labor Force under Changing Income and Employment*, National Bureau of Economic Research, Princeton University Press, 1958.
- Magness, Phillip W., and Robert P. Murphy (2015). "Challenging the Empirical Contribution of Thomas Piketty's *Capital in the 21st Century*," *Journal of Private Enterprise*, forthcoming, manuscript circulated by *Economic History eJournal* 7 (3) 13 January 2015.
- Maine, Bureau of Industrial and Labor Statistics (1891). *Fifth Annual Report of the Bureau of Industrial and Labor Statistics for the State of Maine, 1891*, Burleigh and Flynt, 1892.
- Margo, Robert A. (1988). Interwar Unemployment in the United States: Evidence from the 1940 Census Sample," Barry Eichengreen and Timothy Hatton, editors, *Interwar Unemployment in International Perspective*, Kluwer Academic Publishers, 1988.
- Margo, Robert A. (1993). "The Labor Force Participation of Older Americans in 1900: Further Results." *Explorations in Economic History* 30 (3) Month 1993: 409-23.

- Masson, André, and Pestieau Pierre (1997). "Bequest Motives and Models of Inheritance: A Survey of the Literature," Chapter 3 in Guido Erreygers and Toon Vandevelde, editors, *Is Inheritance Legitimate? Ethical and Economic Aspects of Wealth Transfers*, Springer, 1967: 54-88.
- Mayo Clinic (2014). "Compulsive Hoarding Disorder," on line at <http://www.mayoclinic.org/diseases-conditions/hoarding-disorder/basics/definition/con-20031337>
- Mendershausen, Horst (1956). "The Patterns of Estate Tax Wealth," Part III in Raymond W. Goldsmith, editor, *A Study of Saving in the United States*, Volume 3 "Special Studies," Princeton University Press, 1956: 275-381.
- Michigan, Bureau of Labor and Industrial Statistics (1888). *Sixth Annual Report, February 1, 1889* [sic, read 1888], Thorp & Godfrey, State Printers and Binders, 1889.
- Michigan, Bureau of Labor and Industrial Statistics (1889). *Seventh Annual Report, February 1, 1889*, Thorp & Godfrey, State Printers and Binders, 1890.
- Michigan, Bureau of Labor and Industrial Statistics (1890). *Eighth Annual Report 1890*, Robert Smith & Co., State Printers and Binders, 1891.
- Michigan, Bureau of Labor and Industrial Statistics (1893). *Eleventh Annual Report, February 1, 1894*, Robert Smith & Co., State Printers and Binders, 1894.
- Michigan, Bureau of Labor and Industrial Statistics (1895). *Thirteenth Annual Report for the year Ending February 1, 1896*. Robert Smith & Co., State Printers and Binders, 1896.
- Miller, Sally M. (1973). *Victor Berger and the Promise of Constructive Socialism, 1910-1920*. Greenwood Press, 1973.
- Mirer, Thad W. (1979). "The Wealth-Age Relation among the Aged," *American Economic Review* 69 (3) June 1979: 435-443.
- Modigliani, Franco (1949). "Fluctuations in the Savings-Income Ratio: A Problem in Economic Forecasting," *Studies in Income and Wealth*, Volume 11, National Bureau of Economic Research, 1949: 371-402, 427-431.
- Modigliani, Franco (1966). "The Life-Cycle Hypothesis of Saving: The Demand for Wealth and the Supply of Capital," *Social Research* 33 (2) Summer 1966: 160-217.
- Modigliani, Franco (1986). "Life Cycle, Individual Thrift, and the Wealth of Nations," *American Economic Review* 76 (3) June 1986: 297-313.
- Modigliani, Franco (1988). "The Role of Intergenerational Transfers and Life Cycle Saving in the Accumulation of Wealth," *Journal of Economic Perspectives* 2 (2) Spring 1988: 15-40.
- Modigliani, Franco (2001). *Adventures of an Economist*, Texere, 2001.
- Modigliani, Franco, and Richard Brumberg (1954). "Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data," in Kenneth K. Kurihara, editor, *Post-Keynesian Economics*, Rutgers University Press, 1954: 388-436.
- Moen, Jon R. (1994). "The Unemployment and Retirement of Older Men: Further Evidence from the 1900 and 1910 Censuses," *Historical Methods* 27 (1) 1994: 40-46.

- New Jersey Bureau of Statistics of Labor and Industries (1889). *Twelfth Annual Report of the Bureau of Statistics of Labor and Industries of New Jersey for the Year Ending October 31, 1889*, F.F. Paterson, 1889.
- New Jersey Bureau of Statistics of Labor and Industries (1890). *Thirteenth Annual Report of the Bureau of Statistics of Labor and Industries of New Jersey for the Year Ending October 31, 1890*, Electric Printing Company, 1890.
- New Jersey Bureau of Statistics of Labor and Industries (1891). *Fourteenth Annual Report of the Bureau of Statistics of Labor and Industries of New Jersey for the Year Ending October 31, 1891*, John L. Murphy, 1891.
- Nugent, Jeffrey B. (1985). "The Old-Age Security Motive for Fertility," *Population and Development Review* 11 (1) March 1985: 75-97.
- Officer, Lawrence H. (2009). *Two Centuries of Compensation for U.S. Production Workers in Manufacturing*, Palgrave, 2009.
- Oppenheimer, Valerie Kincade (1982). *Work and the Family: A Study in Social Demography*, Academic Press, 1982.
- Parker, William N. (1974), "Review of *Patterns of Wealthholding in Wisconsin Since 1850* by Lee Soltow," *Journal of Interdisciplinary History* 4 (3) Winter, 1974: 502-505.
- Parker, William N. (1975). "Forward," in Lee Soltow, *Men and Wealth in the United States, 1850-1870*, Yale University Press, 1975: xiii-xv.
- Pettit, Ethel (1931). *The Rich are Always with Us*, Sears Publishing, 1931.
- Piketty, Thomas (2010). "On the Long-Run Evolution of Inheritance: France 1820-2050," Paris School of Economics, working paper, September 2010.
- Piketty, Thomas (2014). "Appendix to Chapter 10. Inequality of Capital Ownership Addendum: Response to FT" May 28, 2014. Downloaded May 30, 2014 from <http://piketty.pse.ens.fr/files/capital21c/en/Piketty2014TechnicalAppendixResponsetoFT.pdf>
- Piketty, Thomas (2014). "Technical Appendix of the Book *Capital in the Twenty-First Century*" [on line document], Harvard University Press: March 2014. Downloaded May 1, 2014 from <http://piketty.pse.ens.fr/capital21c>
- Piketty, Thomas (2014). *Capital in the Twenty-First Century*, translated by Arthur Goldhammer, Harvard University Press, 2014.
- Piketty, Thomas, and Emmanuel Saez (2014). "Inequality in the Long Run," *Science* 344 (6186), May 23, 2014: 838-843.
- Piketty, Thomas, and Gabriel Zucman [2013]. "Capital is Back: Wealth-Income Ratios in Rich Countries, 1700-2010," Paris School of Economics, working paper, July 26, 2013.
- Piketty, Thomas, and Gabriel Zucman [2014]. "Wealth and Inheritance in the Long Run," chapter prepared for the forthcoming *Handbook of Income Distribution*, volume 2, North-Holland, unpublished draft, Paris School of Economics, April 6, 2014.

- Piketty, Thomas; Gilles Postel-Vinay; and Jean-Laurent Rosenthal (2014). "Inherited vs Self-Made Wealth: Theory & Evidence from a Rentier Society (Paris 1872-1927)," *Explorations in Economic History* 51 (1), January 2013: 21-40.
- Preston, Samuel H. (1975). "The Changing Relation between Mortality and Level of Economic Development," *Population Studies* 29 (2) July 1975: 231-248.
- Ransom, Roger L. (2006). "Confederate States of America," Chapter Eh in Susan B. Carter *et al.*, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Volume 5, Cambridge University Press 2006: 773-782.
- Ransom, Roger L., and Richard Sutch (1986). "The Labor of Older Americans: Retirement of Men On and Off the Job, 1870-1937," *Journal of Economic History* 46 (1) March 1986: 1-30.
- Ransom, Roger L., and Richard Sutch (1986). "The Life-Cycle Transition: A Preliminary Report on Wealth-Holding in America," Chapter 10 in *Income and Wealth Distribution in Historical Perspective*, two volumes. Utrecht: Rijksuniversiteit te Utrecht, 1986: volume 1.
- Ransom, Roger L., and Richard Sutch (1987). "Tontine Insurance and the Armstrong Investigation: A Case of Stifled Innovation, 1868-1905," *Journal of Economic History* 47 (2) June 1987: 379-390.
- Ransom, Roger L., and Richard Sutch (1988). "Capitalists Without Capital: The Burden of Slavery and the Impact of Emancipation," *Agricultural History* 62 (3) Summer 1988: 133-160.
- Ransom, Roger L., and Richard Sutch (1989). "The Trend in the Rate of Labor Force Participation of Older Men, 1870-1930," *Journal of Economic History* 49 (1) March 1989: 170-183.
- Ransom, Roger L., and Richard Sutch (1989). "Two Strategies for a More Secure Old Age: Life-Cycle Saving by Late-Nineteenth-Century American Workers," *Working Papers on the History of Saving*, Number 6, Institute of Business and Economic Research, University of California, Berkeley, March 1989.
- Ransom, Roger L., and Richard Sutch (1995). "The Impact of Aging on the Employment of Men in American Working-Class Communities at the End of the Nineteenth Century," Chapter 11 in David I. Kertzer and Peter Laslett, editors, *Aging in the Past: Demography, Society, and Old Age*, University of California Press, 1995: 303-327.
- Ransom, Roger L., and Richard Sutch (2001). *One Kind of Freedom: The Economic Consequences of Emancipation*, Second Edition, Cambridge University Press, 2001.
- Ransom, Roger L.; Richard Sutch; and Samuel H. Williamson (1991). "Retirement: Past and Present," Chapter 1 in Alicia H. Munnell, editor, *Retirement and Public Policy: Proceedings of the Second Conference of the National Academy of Social Insurance*, Kendall Hunt Publishing, 1991: 23-57.
- Ransom, Roger L.; Richard Sutch; and Samuel H. Williamson (1993). "Inventing Pensions: The Origins of the Company-Provided Pension in the United States, 1900-1940," Chapter 1 in K. Warner Schaie and W. Andrew Achenbaum, editors, *Societal Impact on Aging: Historical Perspectives*, Springer Publishing, 1993: 1-44.
- Rhode, Paul W. (2002). "Gallman's Annual Output Series for the United States, 1834-1909," *National Bureau of Economic Research Working Paper*, Number 8860, National Bureau of Economic Research, April 2002.

- Rhode, Paul W., and Richard Sutch (2006). "Estimates of National Product before 1929," In Susan B. Carter *et al.*, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Cambridge University Press, 2006: III: 12-19.
- Rosenbloom, Joshua L., and Gregory W. Stutes (2008). "Reexamining the Distribution of Wealth in 1870," in Joshua L. Rosenbloom, editor, *Quantitative Economic History: The Good of Counting*, Routledge, 2008.
- Ruggles, Steven; J. Trent Alexander; Katie Genadek; Ronald Goeken; Matthew B. Schroeder; and Matthew Sobek (2010), "IPUMS Design: Introductory Essays on Using the IPUMS," Chapter 5: Family Interrelationships [Machine-readable file], *Integrated Public Use Microdata Series: USA*, University of Minnesota, 2010.
- Ruggles, Steven; J. Trent Alexander; Katie Genadek; Ronald Goeken; Matthew B. Schroeder; and Matthew Sobek (2010). *Integrated Public Use Microdata Series: USA*, Version 5.0 [Machine-readable database]. University of Minnesota, 2010.
- Shammas, Carole. (1993), "A New Look at Long-Term Trends in Wealth Inequality in the United States," *American Historical Review* 98 (2), April 1993: 412-432.
- Shorrocks, A. F. (1975). "The Age-Wealth Relationship: A Cross-Section and Cohort Analysis," *Review of Economics and Statistics* 57 (2) May 1975: 155-163.
- Short, Joanna (2002). "Economic History of Retirement in the United States," on line in Robert Whaples, editor, *EH.Net Encyclopedia*, September 2002.
- Smith, Harriet Elinor, editor (2010). *Autobiography of Mark Twain*, Volume 1, University of California Press, 2010.
- Snowden, Kenneth A. (1987). "Mortgage Rates and American Capital Development in the Late Nineteenth Century," *Journal of Economic History* 47 (3) September 1987: 671-692.
- Snowden, Kenneth A. (1995). "The Evolution of Interregional Mortgage Lending, 1870-1940: The Life Insurance-Mortgage Company Connection," in Naomi Lamoreaux and Daniel Raff, editors, *Coordination and Information: Historical Perspectives on the Organization of Enterprise*, University of Chicago Press, 1995: 209-247.
- Snowden, Kenneth A. (1997). "Building and Loan Associations in the U.S., 1880-1893: The Origins of Localization in the Residential Mortgage Market," *Research in Economics* 51, 1997: 227-250.
- Snowden, Kenneth A. (2006). "Construction, Housing, and Mortgages," Chapter Dc in Susan B. Carter *et al.*, editors, *Historical Statistics of the United States: Earliest Times to the Present, Millennial Edition*, Volume 4, Cambridge University Press, 2006: 395-572.
- Soltow, Lee (1971). *Patterns of Wealthholding in Wisconsin Since 1850*, University of Wisconsin Press, 1971.
- Soltow, Lee (1975). *Men and Wealth in the United States, 1850-1870*, Yale University Press, 1975.
- Squier, Lee Welling (1912). *Old Age Dependency in the United States: A Complete Survey of the Pension Movement*, Macmillan, 1912.
- Stata Corporation (2007). *Stata Statistical Software: Release 10*, Volume Reference I-P, 2007.

- Steckel, Richard H. (1992). "The Fertility Transition in the United States: Tests of Alternative Hypotheses," Chapter 12 in Claudia Goldin and Hugh Rockoff, editors, *Strategic Factors in Nineteenth Century American Economic History*, University of Chicago Press, 1992:351-397.
- Stiglitz, Joseph E. (2011). "Of the 1%, by the 1%, for the 1%," *Vanity Fair*, May 2011: downloaded from <http://www.vanityfair.com/society/features/2011/05/top-one-percent-201105>.
- Stiglitz, Joseph E. (2012). *The Price of Inequality: How Today's Divided Society Endangers our Future*, W.W. Norton, 2012, paperback edition, 2013.
- Summers, Lawrence H. (2014). "The Inequality Puzzle: Thomas Piketty's Tour de Force Analysis Doesn't Get Everything Right, But It's Certainly Gotten Us Pondering the Right Questions," *Democracy* (32) Spring 2014, downloaded May 23, 2014 from <http://www.democracyjournal.org/32/the-inequality-puzzle.php?page=all>.
- Sundstrom, William A. (2006). "Hours and Working Conditions," in Susan B. Carter *et al*, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Volume 2, Cambridge University Press 2006: 46-54.
- Sutch, Richard (1991). "All Things Reconsidered: The Life-Cycle Perspective and the Third Task of Economic History," *Journal of Economic History* 51 (2) June 1991: 271-288.
- Sutch, Richard (2006). "National Income and Product," Chapter Ca in Volume III of Susan B. Carter *et al.*, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Cambridge University Press, 2006: 3-69.
- Sutch, Richard (2006). "Saving, Capital, and Wealth," Chapter Ce in Volume III of Susan B. Carter *et al.*, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Cambridge University Press, 2006: 287-332.
- Sutch, Richard (2009). "Modigliani, Franco (1918-2003) [The Economic Contributions of Franco Modigliani]." In Larry Blume and Steven Durlauf, general editors, *The New Palgrave Dictionary of Economics*, second edition, Palgrave Macmillan, 2009.
- Sutch, Richard (2010). *A Survey of 1,084 Workers in Maine, 1890; Reported in the Fifth Annual Report of the Maine Bureau of Industrial and Labor Statistics: Codebook and User's Manual*, Historical Labor Statistics Project, University of California, 2010.
- Sutch, Richard (2011). "Hard Work, Nonemployment, and the Wealth-Age Profile: Evidence of a Life-Cycle Strategy in the United States during the Nineteenth Century," Paper presented at the National Bureau of Economic Research's Development of the American Economy Program Meeting, Cambridge, Massachusetts, March 5, 2011.
- Sutch, Richard (2011). "Wealth Accumulation in the Gilded Age: The U.S. Wealth-Age Profile for 1870," paper presented at the European University Institute Workshop on the Economics of Historical Households, Fiesole, Italy, March 25, 2011.
- Sutch, Richard (2014). "Financing the Great War: A Class Tax for the Wealthy, Liberty Bonds for All," paper presented at the Thirty-Ninth Annual Meeting of the Social Science History Association, *Inequalities: Politics, Policy, and the Past*, Toronto, Canada, November 6-9, 2014.

- Sutch, Richard (2014). "The Liquidity Trap, the Great Depression, and Unconventional Policy: Reading Keynes at the Zero Lower Bound," *Berkeley Economic History Laboratory Working Paper*, Number 2014-05, October 2014.
- Sutch, Richard (2015). "Philanthropic Endeavors, Saving Behavior, and Bourgeois Virtues," paper to be presented at the Festschrift Conference: *Humanism Challenges Materialism in the Work of Deirdre Nansen McCloskey*, March 21-22, 2015, Chicago.
- Thaler, Richard H. (1994). "Psychology and Savings Policies," *American Economic Review* 84 (2) May 1994: 186-192.
- Twain, Mark (1869). "Open Letter to Com. Vanderbilt," *Packard's Monthly*, August 1869, as reprinted in Budd [1992: 287-288].
- Twain, Mark (1881). *The Adventures of Tom Sawyer*, American Publishing Company, 1881.
- Twain, Mark (1885). *The Adventures of Huckleberry Finn*, Charles L. Webster and Co., 1885 [downloaded from http://www.online-literature.com/twain/huckleberry_finn/]
- Twain, Mark (1897-1906). *Autobiography of Mark Twain*, Volume 1, Harriet Elinor Smith, editor, University of California Press, 2010.
- Twain, Mark, and Charles Dudley Warner (1873). *The Gilded Age: A Story of Today*, American Publishing Company, 1873.
- U.S. Bureau of the Census (1900). *Special Reports: Occupations at the Twelfth Census*, U.S. Government Printing Office, 1904.
- U.S. Bureau of the Census (1975). *Historical Statistics of the United States, Colonial Times to 1970*, Bicentennial Edition, two volumes, Government Printing Office, 1975.
- U.S. Bureau of the Census, James W. Glover (1921). *United States Life Tables, 1890, 1901, 1910, and 1901-1910*. Government Printing Office, 1921.
- U.S. Census Office (1870). *Statistics of the Population of the United States from the Original Returns of the Ninth Census (June 1, 1870)*. Government Printing Office, 1872.
- U.S. Census Office (1880). *Statistics of the Population of the United States at the Tenth Census (June 1, 1880)*. Government Printing Office, 1883.
- U.S. Census Office (1890). "Iron Ores," by John Birkenbine in *Report on Mineral Industries in the United States at the Eleventh Census: 1890*, Final Reports Volume 7, Government Printing Office: 1892: 1-30.
- U.S. Census Office (1890). *Report on Population of the United States at the Eleventh Census: 1890*, Final Reports Volume I, Part II, Government Printing Office: 1897.
- U.S. Census Office (1900). *Twelfth Census of the United States Taken in the Year 1900; Manufactures*, Volume 7, Part 1, Government Printing Office, 1902.
- U.S. Census Office (1978). *Twenty Censuses: Population and Housing Questions, 1790-1980*, Government Printing Office, 1978.

- U.S. Census Office, Ninth Census (1870). *Statistics of the Population of the United States from the Original Returns of the Ninth Census (June 1, 1870)*, Washington, D.C., Government Printing Office, 1872.
- U.S. Census Office, Ninth Census (1870). *Statistics of Wealth and Industry of the United States, Volume III*, Washington, D.C., Government Printing Office, 1872.
- U.S. National Archives and Records Administration (no date). "1870 U.S. Census, Population Schedules," *NARA Microfilm Publication M593*, 1,761 rolls, National Archives and Records Administration: n.d.
- Vedder, Richard (2005). [Obituary of Lee Solow], *EH.news*, May 18, 09:52:15 EDT, 2005. Download from <http://eh.net/pipermail/eh.news/2005-May/000836.html>
- Velasco, Schuyler (2014). "CEO pay hits \$10 million, 257 times worker pay," *Christian Science Monitor*, Weekly Digital Edition, 27 May 2014, downloaded May 28, 2014 from <http://www.csmonitor.com/Business/2014/0527/CEO-pay-hits-10-million>
- Warsh, David (1985). "Why the Rich Stay Rich, the Poor Stay Poor," *Boston Globe*, 8 December 1985: A1+A23.
- Weir, David R. (1992). "A Century of U.S. Unemployment, 1890-1990: Revised Estimates and Evidence for Stabilization." *Research in Economic History* 14 (1992): 301-346.
- Wikipedia (2014). "Occupy Wall Street," downloaded May 23, 2014 from http://en.wikipedia.org/wiki/Occupy_Wall_Street. "Occupy Movement," downloaded May 23, 2014; http://en.wikipedia.org/wiki/Occupy_movement. "We Are the 99%," downloaded May 23, 2014; and http://en.wikipedia.org/wiki/We_are_the_99%25.
- Williamson, Samuel H. (2010). "Seven Ways to Compute the Relative Value of a U.S. Dollar Amount, 1774 to Present," measuringworth.com [calculator on line], April 2010.
- Wisconsin, Bureau of Labor, Census and Industrial Statistics (1896), *Seventh Biennial Report, 1895-1896*, Democrat Printing Co., State Printer, 1896.
- Wolff, Edward N. (2010). "Recent Trends in Household Wealth in the United States: Rising Debt and the Middle-Class Squeeze – an Update to 2007," *Levy Economics Institute of Bard College Working Paper* Number 589: March 2010.
- Wolff, Edward N. (2012). "The Asset Price Meltdown and the Wealth of the Middle Class," *National Bureau of Economic Research Working Paper*, Number 18559, November 2012
- Wolff, Edward N. (2014). "Household Wealth Trends in the United States, 1862-2013: What Happened over the Great Recession?" *National Bureau of Economic Research Working Paper* Number 20733, December 2014.
- Yaari, Menahem E. (1965). "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer," *Review of Economic Studies* 32 (2): 137-150.

Table 1. Occupations and Median Annual Earnings by Age Groups, Michigan Agricultural Implements and Iron Workers, 1890

| Occupation | OCC code | Age less than 45 | | Age 45-59 | | Age 60 + | | Total | |
|-----------------------|----------|------------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|
| | | Respond-ents | Median earnings | Respond-ents | Median earnings | Respond-ents | Median earnings | Respond-ents | Median earnings |
| Laborer | 74 | 944 | 323.50 | 132 | 360.00 | 9 | 336.00 | 1,085 | 330.00 |
| Cooper | 25 | 27 | 368.00 | 8 | 357.50 | 6 | 273.00 | 41 | 360.00 |
| Painter | 96 | 364 | 390.00 | 40 | 387.00 | 5 | 429.00 | 409 | 390.00 |
| Machine hand | 77 | 629 | 390.00 | 55 | 702.00 | 10 | 536.00 | 694 | 416.00 |
| Iron worker | 72 | 99 | 432.00 | 11 | 468.00 | 2 | 425.50 | 112 | 437.50 |
| Wood worker | 184 | 683 | 432.00 | 163 | 520.00 | 36 | 514.50 | 882 | 457.50 |
| Blacksmith | 5 | 357 | 480.00 | 76 | 543.00 | 14 | 483.00 | 447 | 500.00 |
| Engineer | 41 | 73 | 520.00 | 24 | 546.00 | 10 | 424.50 | 107 | 520.00 |
| Machinist | 80 | 796 | 528.00 | 96 | 591.00 | 17 | 504.00 | 909 | 528.00 |
| Molder | 88 | 1,241 | 528.00 | 74 | 703.50 | 10 | 712.50 | 1,325 | 528.00 |
| Carpenter | 18 | 41 | 546.00 | 15 | 561.00 | 4 | 477.00 | 60 | 546.00 |
| Melter | 83 | 8 | 537.00 | 3 | 581.00 | 2 | 507.00 | 13 | 546.00 |
| Boiler maker | 9 | 142 | 648.00 | 33 | 705.00 | 4 | 544.00 | 179 | 662.00 |
| Pattern maker | 98 | 143 | 676.00 | 25 | 702.00 | 14 | 624.00 | 182 | 682.50 |
| Top 14 occupations | | 5,547 | 441.00 | 755 | 520.00 | 143 | 480.00 | 6,445 | 459.00 |
| 216 other occupations | | 2,170 | 416.00 | 203 | 468.00 | 14 | 466.00 | 2,387 | 420.00 |
| All 230 occupations | | 7,717 | 432.00 | 958 | 510.00 | 157 | 480.00 | 8,832 | 441.00 |

Table 2. The Self-Reported Cause of "Decline" for Journeymen Included in the New Jersey Survey of the Health and Trade Life of Workmen, 1889-1891

| | Stiffening of Joints ¹ | Hatters' Shakes ² | Loss of Strength/ Energy ³ | Throat and Lung | Lead Colic | Eyesight Failed | Typhoid/ Malaria | Other |
|----------------------|--------------------------------------|---------------------------------|---|--------------------|------------|--------------------|---------------------|-------|
| Bricklayers & Masons | 67.2 | 0.0 | 13.0 | 2.4 | 0.0 | 2.4 | 0.0 | 15.1 |
| Glass Workers | 46.4 | 0.0 | 9.4 | 22.0 | 0.0 | 8.5 | 0.0 | 13.8 |
| Hat Makers | 25.4 | 60.9 | 0.8 | 9.9 | 0.0 | 0.0 | 0.0 | 3.0 |
| Miners of Iron Ore | 10.0 | 0.0 | 74.4 | 5.5 | 0.0 | 0.0 | 1.1 | 9.0 |
| Carpenters | 35.5 | 0.0 | 36.6 | 0.0 | 0.0 | 8.6 | 0.0 | 19.4 |
| Potters | 14.7 | 0.0 | 18.9 | 44.1 | 13.7 | 0.0 | 0.0 | 8.6 |
| Painters | 5.1 | 0.0 | 8.2 | 3.2 | 68.3 | 1.9 | 0.6 | 12.7 |
| Printers | 2.2 | 0.0 | 15.6 | 20.1 | 2.2 | 37.9 | 0.0 | 21.9 |
| Plumbers | 17.1 | 0.0 | 5.7 | 8.6 | 7.1 | 0.0 | 42.8 | 18.6 |

Sources: New Jersey 1889: table vii, pp. 146-154; New Jersey 1890: table 6, pp. 403; New Jersey 1891: 178 and table 6, pp. 210-212.

Notes: 1/ Includes "Rheumatism." 2/Mercury poisoning. 3/ Includes "General Disability," "Old Age," etc.

The shaded cells represent the leading cause of decline for each occupation.

Table 3. Reported Weekly Wage Rates, Males, Three Selected Occupations
 Agricultural Implements and Iron Industries, Michigan, 1890

| Men aged: | Unskilled Labor | | Molder | | Machinist | |
|--|-----------------|--------|-----------|--------|-----------|--------|
| | Wage Rate | | Wage Rate | | Wage Rate | |
| | Dollars | Number | Dollars | Number | Dollars | Number |
| 25-44 | 8.14 | 523 | 13.25 | 769 | 12.35 | 482 |
| 45-59 | 8.10 | 132 | 14.57 | 74 | 12.08 | 96 |
| 60 and over | 7.07 | 9 | 14.85 | 10 | 12.47 | 17 |
| Men 60 and over as a percentage of men 45 and over | | 6.4 | | 11.9 | | 15.0 |

Table 4. Distribution of Wage Rates Paid to Unskilled Labor
 Agricultural Implement Industry and Iron Works
 Males 21 and over, Michigan, 1890

| <u>Weekly Wage Reported</u> | <u>Number</u> | <u>Percentage</u> |
|-----------------------------|---------------|-------------------|
| Less than \$6 | 4 | 0.6 |
| \$6.00 | 30 | 4.5 |
| Between \$6.00 and \$7.00 | 3 | 0.5 |
| \$7.00 | 64 | 9.6 |
| Between \$7.00 and \$7.50 | 1 | 0.2 |
| \$7.50 | 192 | 28.9 |
| Between \$7.50 and \$8.00 | 6 | 0.9 |
| \$8.00 | 138 | 20.8 |
| Between \$8.00 and \$8.50 | 43 | 6.5 |
| \$8.50 | 2 | 0.3 |
| Between \$8.50 and \$9.00 | 0 | 0.0 |
| \$9.00 | 116 | 17.5 |
| Between \$9.00 and \$10.00 | 7 | 1.1 |
| \$10.00 | 16 | 2.4 |
| Greater than \$10.00 | 42 | 6.3 |
| | <u>664</u> | <u>100.0</u> |

Table 5. Proportion of Journeymen Age Sixty or Older, Selected Occupations, New Jersey, 1889-1891

| Occupation | Men, 21 and Older, in New Jersey Survey | | 1890 U.S. Census Enumeration, Males | Percentage Coverage |
|-----------------------|--|----------------------------|--|---------------------|
| | Number Surveyed | Percen t 60 or Older | | |
| Building Trades | 5,650 | 0.8 | 40,405 | 14.0 |
| Hat Makers | 2,577 | 2.0 | 4,745 | 54.3 |
| Miners of Iron Ore | 1,269 | 3.1 | 1,380 | 92.0 |
| Potters | 1,122 | 0.6 | 2,078 | 54.0 |
| Glassmakers | 1,040 | 0.9 | 4,221 | 24.6 |
| Printers | 462 | 0.4 | 3,261 | 14.2 |
| Total | 12,120 | 0.9 | 56,090 | 21.6 |

Table 6. Test of Confounding Cohort Effects

| Age in 1870 | Year cohort was age 35 | | Index of wealth if no dissaving |
|----------------|------------------------|-----------------------------|------------------------------------|
| | Year | Real hourly compensation | |
| 35 | 1870 | \$0.90 | 100 |
| 40 | 1865 | \$0.71 | 144 |
| 50 | 1855 | \$0.81 | 229 |
| 60 | 1845 | \$0.78 | 297 |
| 65 | 1840 | \$0.68 | 327 |
| 70 | 1835 | \$0.64 | 349 |
| 75 | 1830 | \$0.64 | 356 |

Source for real wage: Officer (2009: Table 7.2, p. 170).