The Accumulation, Inheritance, and Concentration of Wealth during the Gilded Age: An Exception to Thomas Piketty's Analysis

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ABSTRACT

Thomas Piketty predicts that "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." His forecast is based on an assumption that most bequests are motivated by an altruistic motive to accumulate assets to endow one's own children. Piketty claims that a similar mechanism was operative in the U.S. during the Gilded Age (roughly 1870-1917).

In this paper I make three claims. One: Piketty's argument that the bequest motive for accumulating wealth dominates the retirement and precautionary motives inaccurately describes the life-cycle hypothesis of saving associated with Franco Modigliani. As a result of his misunderstanding Piketty inappropriately concludes that the bequest motive must logically dominate the dynamics of wealth accumulation. Two: I examine the one-percent sample of the manuscript returns from the U.S. Census of 1870 to estimate the distribution of wealth at an early date during the Gilded Age. Synthetic cohorts derived from the cross section suggest that family wealth holdings declined sharply after an age in the mid-fifties. The bulk of saving during the Gilded Age was generated by the middle class during the families' peak-earning years. Three: A massive digital collection of wills and probate records assembled by Ancestry.com, which has been available on line since September 4, 2015, should make it possible to trace the financial life histories of the very rich. I propose a research project that would focus on the wealthiest families included in the 1870 census sample. I present the results of my first attempt to use the Ancestry.com archive to literally follow the money for a few members of this elite. My preliminary work suggests that many of the large fortunes of 1870 were the result of business success and luck rather than of inheritance. Many of the super-rich spent lavishly on consumption and philanthropy and thus dissipated much of their fortune before death (if they lived long enough). When some bequeathed a large sum it was typically the unintended consequence of dying at a significantly younger age than prudent life-cycle planning would have anticipated.

I offer a tentative suggestion that an important motive for accumulating wealth in the Gilded Age was entrepreneurial combined with an effort to keep a family firm intact and in the firm control of its founder. At the time institutions that would make it easy to separate ownership from management were nonexistent or risky. The illiquidity of business assets might explain the failure on the part of some entrepreneurs to consume the bulk of their wealth before death. Typically, the businesses lived on intact after their owner-founder died. Businesses do not leave bequests.

[445 words]

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

Leonard Cohen[1]

Beginning with the Occupy Wall Street encampments in Zuccotti Park, September through December of 2011, popular attention has focused on the disparity between those in the top 1 percent of the wealth distribution and those in the bottom 99. 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 Occupy Movement has been seen as a failure that produced no lasting changes. Despite protestors' focus on the upsurge in the incomes earned by senior company executives, most executive compensation plans have remained as generous as ever (and are becoming more so). Attempts to rein in the most egregious packages at prominent companies have failed [Das, Esterl, and Lublin 2014]. The Occupy Movement didn't last, but it did initiate a long-delayed consideration of economic inequality and its partner, political inequality.[3] The English translation of Thomas Piketty's, *Capital in the Twenty-First Century* injected new energy into

[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 defined-pension benefits from both private plans and Social Security. An alternative estimate of the marketable wealth owned by the top 1 percent of families based on the capitalized value of the income reported in federal tax returns set the percentage at 37 percent in 2007 and 41.8 percent in 2012 [Saez and Zucman 2015, online "Technical Appendix," Table B1].

[3] Some view the recent political assent of Donald Trump and Bernie Sanders as reflecting a bi-partisan revolt against political marginalization [Reich 2015].

the debate. 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]. He goes on to predict ever-increasing concentrations of *wealth* in the future:

> 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]

This prediction depends on the claim that:

> [Because] the past tends to devour the future: wealth originating in the past automatically grows more rapidly, even without labor, than wealth stemming from work, which can be saved. Almost inevitably, this tends to give lasting disproportionate importance to inequalities created in the past, and therefor to inheritance. [p. 378]

This "remarkable claim" implies, as Paul Krugman suggested, that 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].

Piketty's prediction of the predominance of inheritance over saving as the source of most wealth in the twenty-first century is based on a key *assumption* that wealth accumulation is primarily motivated by a common desire to leave sizable bequests to children and grandchildren. From that assumption he reasons that the source of most wealth in private hands today is the intentional inheritances passed from one generation to the next, at least 50 to 60 percent [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. This explanation is thought to hold true for the large majority of individual savers and to account for the bulk of aggregate saving. In 2002 a classic

paper published in the *American Economic Review* Karen Dynan, Johnathan Skinner and Stephen Zeldes described the life-cycle model as "the workhorse of consumption and saving research for the past four decades" [2002: 274]. Michael Hurd calls it "the standard model of the analysis of consumption and saving" [2003: 93]. Most economists also share a belief that individuals with strong bequest motives are comparatively rare. Bradford DeLong, referred without qualification to a broad agreement that bequests *do not* play "an overwhelmingly decisive role in the wealth accumulation of any cohort." And, while they play a role, they are not the predominant explanation of wealth inequality [DeLong 2003: 33].

The life-cycle model, originally proposed by Franco Modigliani and Richard Brumberg [1954, and Modigliani 1966 and 1986], embodies both the precautionary motive and the retirement motive for saving and downplays the significance of a dynastic bequest motive.[4] The core of the life-cycle idea is that workers, not wanting to become a burden to their grown children, would save during their peak-earning years to build a retirement fund to support their consumption in old age. The fund would also serve as a buffer to smooth consumption in the face of fluctuations in income and to meet contingencies while working. Parents' regard for their children will be expressed as investments in their education rather than promises of a substantial inheritance.

Without denying the dangers or likelihood of the increasing control of wealth by the top 1 percent, this paper suggests that the power of the inheritance mechanism alluded to in the passages quoted from Piketty's book is exaggerated. Piketty does not seem to appreciate the full range of motives for accumulating and holding wealth and the broad range of contingencies that trigger bequests. Piketty claims that the dynastic bequest motive for accumulating wealth dominates the life-cycle motive. I argue that his claim is not evident, not proven, and not logical.

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 to look at saving and wealth in America's

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[4] Modigliani claimed that "the bequest process plays an important, but quantitatively modest, role in the process of accumulation of national wealth" [1988: 23].

Gilded Age.[5] My focus on the nineteenth century is not an entirely discordant intrusion into the debate given Piketty's own methodology. He refers repeatedly to the American Gilded Age as a period marked by extreme wealth inequality preserved and intensified by end-of-life bequests [pp. 348-350, 375, 378, 506]. "In all likelihood," he suggests," "inheritance will again play a significant role in the twenty-first century, comparable to its role in the [nineteenth century]" [p. 377]. His analysis throughout is that of an economic historian. Alexander Field's review for the *Journal of Economic History* praises the book as "both an exemplary work in quantitative economic history and economic literature in the finest sense" [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 state archives that preserved the original returns on estate or inheritance taxes.[6] Piketty 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 [Kopczuk and 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]

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[5] 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 "Great War," 2015, 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 lived during a false "golden age," gilded on the surface but base and vulgar underneath.

[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 Sutch [2015 "The One-Percent"] I offer an analysis of why these results should be disregarded.

For the United States in the nineteenth century Piketty presents only a single data point, an estimate for 1870 of 32 percent 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 conducted at the time of the 1870 Census of Population [1975]. Piketty admits, 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), Piketty makes no effort to put the American data for the period before 1917 into any kind of historical context.[9] Yet the weakness of Piketty's nineteenth century data is reason enough to see what more might be said.[10] After all, he prophesizes that the Gilded Age of Robber Barons will be returning soon.

Another reason to take seriously the available evidence from nineteenth-century America is that the data on wealth holding is far richer than what Piketty has cited. My coauthors and I have collected 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, saving, and asset holdings. Some

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[8] 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 the adjustment. 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, Piketty used a rather dubious procedure to extrapolate from data based on probate records recorded around 1774, thirty-six years earlier. See my discussion of this in Sutch [2015 "The One-Percent'].

[9] 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) deemed that that effort alone is "a Nobel Prize-worthy contribution" [Summers 2014].

[10] 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; systematic data on the distribution of income for the nineteenth century is virtually nonexistent.

of the reports also provide responses to retrospective questions concerning saving, income, and productivity [Carter, Ransom, and Sutch 1991, Sutch 2011]. Moreover, there is no need to rely on Soltow's limited report on wealth in 1870 since the Integrated Public-Use Microdata Project at the University of Minnesota (IPUMS) has made available on line a one-percent random sample of the household-level returns with information on name, age, sex, occupation, family relationships, and – of course – wealth [Ruggles *et al.* 2010, Rosenbloom and Stutes 2008].[11] The two types of data – the savings surveys and the wealth census – taken together allow me to expand the focus from Piketty's emphasis on the top 1 percent to the inequalities among the other 99 percent.[12]

Piketty's projection of an increasing concentration of wealth depends on the strength of the bequest motive. The role of inheritance, he says, is the "crucial issue" [2014: 377]. As a half century of research with twentieth-century data has shown, efforts to pin down the relative roles of intentional bequests and life-cycle saving have not produced a consensus. Jonathan Gruber remarked "this is not only an enormously important problem, but also an enormously difficult one" [2003: 126]. With reference to the United States, Piketty remarks that the paucity and unreliability of the historical data on inheritance flows is the major obstacle [2014: 427]. When Piketty was writing a systematically collected archive of wills and probate documents did not exist. The type of study conducted by Livio Di Matteo for late nineteenth-century Canada using probate records, for example, has not been attempted for the United States [Di Matteo 2008]. Just 9 weeks ago, however, Ancestry.com made available in a searchable on-line archive with over 170 million pages of wills and probate records from the United States. The records cover all 50 states and span 338 years (1668-2005). They reference over 100 million individuals either as

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[11] Soltow's findings were based on an idiosyncratic "spin sample" drawn from the physical 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! [Soltow 1975: 4-5]. Despite a public plea by a distinguished colleague that he share his data [Lebergott 1976: 796-797], Soltow never did so "on the grounds that the scholar would misuse it" [Vedder 2005]. The raw data no longer exists.

[12] 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].

authors or heirs. The wills included in this vast collection will allow social science historians to literally "follow the money" in an unprecedented look at intergenerational wealth transfer. There is also an added bonus. As documents written in anticipation of death, wills are often candid, intimate, and emotional. The press release announcing the archive suggested that a "deeper level of understanding is possible," through exploration of the "intricate details" of the lives and family connections revealed in these documents [Roth 2015].

Evaluating this new evidence will take some time, yet as a rough generalization, I can say that in the nineteenth century only the wealthy wrote wills. But the wealthy are precisely the individuals who are central to the Piketty thesis. Only the wealthy can bequeath a fortune. The Ancestry.com archive should allow social science historians to directly test the assumption that dynastic bequest motives for accumulating wealth dominated a life-cycle motive. It is too soon, of course, to have completed even a pilot study. However, I will propose here a research protocol for systematically exploring these data. I solicit suggestions for its design and for financing its implementation and I also provide, as a teaser, a small sampling of what a collective financial biography of the gilded rich might look like.

The Bequest Motive versus the Life-Cycle Motive: The Logic

Piketty provides no U.S. data to support his assumption about the dominating influence of bequests.[13] To sustain the credibility of his alternative view, Piketty casts rhetorical doubt on the empirical validity of Modigliani's life-cycle saving hypothesis. 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" [p. 391]. "The massive dissaving by the elderly predicted by the life-cycle theory of saving does not seem to occur" [p. 400]. Yet, each of

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[13] Piketty does present data from France and "especially" from Paris [2014: 393-396]. However, they hardly provide unambiguous support for his claims. The numbers displayed in Piketty's Table 11.1 [p. 394] actually reveal declining wealth by age after the age bracket for 60- to 69-year olds for the years since 1947. That hump-shaped age profile is a signature prediction of the life-cycle hypothesis.

these assertions has been rejected by recent studies.[14] Few who have reviewed the literature would take the hard line against the relevance of the life-cycle theory adopted by Piketty.

Piketty relies on two lines of reasoning to support his rejection of the life-cycle motive. Each argument is problematic.

Piketty's first line of reasoning is based on the observation that wealth inequality "in all countries and all periods for which data is available" "is always more concentrated than the distribution of income from labor" [Piketty 2014: 244]. He claims that this fact requires a 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 logic is valid only if it refers to the level of wealth on the day of retirement. Piketty's evidence is not for workers near retirement, but instead includes the entire adult community. The life-cycle model would predict that even in a case where every worker received the identical wage, a considerable *inequality* of wealth would be present. And that is true whether the concentration of wealth is measured across all households or within each age cohort. The following simple examples should convey some of the basic intuition.

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[14] 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., 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 [Hurd and Rohwedder 2011 and Banerjee 2015]. 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.

Figure 1 reproduces a diagram employed by Franco Modigliani to illustrate his hypothesis of saving. This figure, first published in *Social Research* in 1966, represents a stylized temporal profile of income and consumption for an individual who enters the labor force at age 20 and lives for an additional 50 years to the biblically-allotted age of 70 [Psalm 90.10].

The diagram portrays the case of a wage earner with labor income, **Y**(t), constant at $100 for 40 years and zero thereafter. The worker is assumed to fully retire at age 60. Consumption, **C**(t), is to be constant over the individual's entire life. The worker is assumed to know the date of retirement and the date of death with

Figure 1. The Modigliani Triangle
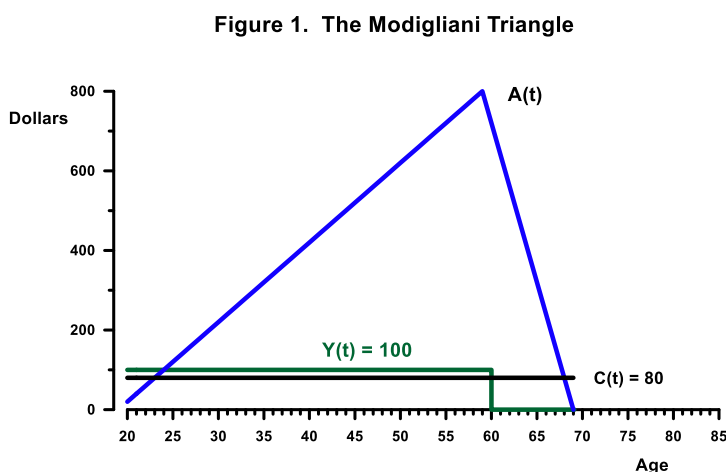
certainty. This simplified, highly-stylized version of the life-cycle hypothesis assumes that the individual has no bequest motive and will therefore choose to exhaust the total income earned over a lifetime through consumption. For simplicity this example assumes that assets earn no return: no interest, no rents, no capital gains. The constant level of consumption required by these assumptions will be $80 per year and the rate of saving while working will be 20 percent. The savings are safely invested in asset holdings, which rise from zero at the outset to a peak magnitude of $800 at age 60 (the age of retirement), which is just sufficient to finance consumption for the final ten years of life, when the worker is assumed to be without employment or a source of income: no Social Security, no pension, no help from grown children. During retirement the assets are "dissaved" and eventually are drawn down to zero at the predetermined time of death. The individual's life-time wealth profile would exhibit a triangular shape as shown by the lines labeled **A**(t). Modigliani labeled this diagram with its hump-shaped asset profile the "trademark" of the life-cycle hypothesis [Modigliani 2001: 300].[15] Piketty calls it the "Modigliani Triangle."
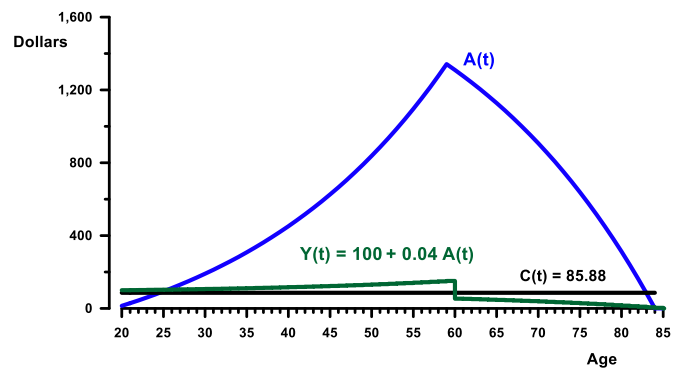
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[15] If I might brag a bit, I was Franco Modigliani's research assistant at the time he prepared the *Social Research* paper for publication. I drafted the original version of the diagram reproduced here [Modigliani 1966: 165]. It was

Now populate an entire economy with an equal number of households at each adult age and assume this economy is in stasis with neither incomes nor population growing. Each household consists of a couple and their own or adopted children. The income is the joint earnings of the two partners and the consumption is jointly enjoyed by the family. It is easy to see that at any point in time the distribution of wealth will not be equal. Each couple's wealth is given by the height of the asset triangle. Those just starting work will have accumulated very little and those near death will have very little wealth remaining. Couples close to retirement or in the first years of retirement will have a great deal of wealth. In this cartoon world of perfect income equality for the wage earners, the top 10 percent of the wealth distribution will hold 19 percent of the total wealth of society, while the bottom 20 percent hold only 4 percent. No wealth is passed on to the next generation and each household consumes over its lifetime every unit of income earned.

A more realistic set of assumptions preserves the basic insight. Consider **Figure 2**. Here the date of death is uncertain so each prudent couple plans to save enough by retirement age to finance a sustained level of consumption even if they both live to a "ripe old age." The Psalm that set the life span at threescore years plus ten,

Figure 2. The Wealth Triangle with Uncertain Date of Death

also allowed for fourscore years *if strong*. My modified diagram is more generous, allowing for a possible life of 85 years. Labor income remains constant and equalitarian at $100 per year. Some additional realism is achieved, however, by assuming that assets earn a constant rate of return of 4 percent per year. Each household can now afford to consume $85.88 per year (rather than $80). If all members of society actually live to be 85, then the top 10 percent of the wealth distribution

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also included in Modigliani's Nobel Prize lecture [1986]. For a brief assessment of Modigliani's contributions to economics see Sutch [2009].

would hold 22 percent of society's wealth and the bottom 20 percent of households would own only 2 percent.

Alas, most will not live so long. If on average they live only threescore and ten, the top 10 percent would own 28 percent of the total and the bottom 20 percent would hold 3 percent. A key point here is that those who die at age 70 would leave an estate of $955. This bequest is accidental, the result of death occurring before the planned-for age of 85. The force of mortality being what it is, only a very few in the population will actually live to an advanced old age. In this hypothetical world with no bequest motives, almost every household will leave a bequest. The ubiquitous existence of wills and inheritances is no proof that a bequest is commonplace [Hurd 2002, 2003].

One additional point is that in real life the distribution of the age at death ranges over all ages. Thus the unplanned bequests generated by these deaths will range in size from very small to substantial. And, the age of the heirs will also range widely. Thus the concentration of wealth of the generation that inherits will be unequal for each age cohort despite the fact that the simple example discussed here assumes that all workers earn a constant $100 per year.

Piketty's second rhetorical argument intended to support the notion of strong bequest motives and weak life-cycle motives adopts a simulation framework introduced by Laurence Kotlikoff and Lawrence Summers [Piketty 2014: 427-428, and 2010: 73; Piketty, Postel-Vinay, and Rosenthal 2014: 24; and Kotlikoff and Summers 1981]. Their approach estimates the aggregate volume of bequests received in a given year (1962) 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 cohort of decedents. Summed over all ages they convert this flow to a stock by assuming a constant age gap of 30 years between the decedent and the heirs and making allowances for population and productivity growth. This stock is compared with the total of privately held wealth. According to Piketty this procedure suggests that "inherited wealth probably accounted for at least 50-60 percent of total private capital in the United States in 1970 to 1980" [2014: 428].

Modigliani, in the course of a critical discussion of the Kotlikoff-Summers methodology, put the percentage of wealth that was inherited at 17 percent when estimated by this technique [1988: 20]. He thought this would be an exaggeration of the importance of the dynastic bequest motive because the method includes unintended bequests as well as those deliberately planned by the decedent for the next generation [1988: 37-38]. The Kotlikoff-Summers procedure also includes interspousal inheritance which is not generally thought to be motivated by the desire to establish a family dynasty.

Piketty's estimate is so much higher than Modigliani's because Piketty takes a bequest received 30 years prior to the inheritor's death and inflates the amount allowing it to grow with interest at 4 percent. After 30 years a bequest evaluated in this way would appear more than 3 times as large as when it was received.[16] Piketty then compares the resulting "capitalized bequest" to the current magnitude of the asset holdings of the recipient. His approach leads to some nonsense. It is perfectly possible that the inflated inheritance could exceed the recipient's current wealth, suggesting that more than 100 percent of the 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 spent most of the inherited assets.

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 2014, Technical Appendix: 64, Piketty, Postel-Vinay, and Rosenthal 2014: 24]. If you had received a bequest but die with less wealth than the inheritance, Piketty labels all of your wealth as inherited. But it is equally plausible to assume in this case that all of the remaining 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-and-saved wealth when they draw down

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[16] This capitalization procedure is highly sensitive to the assumed rate of interest. At a 5 percent return, a rate of return on capital that Piketty assumes elsewhere [2014: 52-53, 199], the value is inflated 4.3 times. The further in the past the bequest was received the larger the inflated sum would appear today. Intuition suggests the reverse should be true. The further in the past that an inheritance is received the *less* salient it should be.

a portfolio that mingles the two. This Piketty-modified K-S measure simply ignores the recipient's agency in shaping and spending his wealth portfolio. Yet, this agency is the key idea behind the life-cycle hypothesis. "Save it when you need it least, have it when you need it most" [quoted in the *Boston Globe*, Warsh 1985: A1].[17]

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]. 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. I conclude that Piketty's dismissal of the life-cycle hypothesis is unwarranted.

Wealth in the Gilded Age: A Test of Two Motives
The bequest motive (Piketty) and the life-cycle motive (Modigliani) have different implications for the profile of wealth over an individual's life time. The life-cycle model suggests that workers will save during their peak-earning years and dissave during their late life when labor earnings fall or end. Wealth should therefore rise over the working years and then decline in late life. Saving for bequests, on the other hand, would never be negative. In that case wealth would continue to accumulate even after retirement.

The two motives are not mutually exclusive, but the objective here is to establish which impulse was dominant during the Gilded Age. If many households were following a life-cycle strategy with only a modest bequest target, the wealth data arranged by age should display a

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[17] According to the *Chicago Tribune,* Modigliani claimed that the life-cycle hypothesis was inspired by this 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."

hump shape rising to a peak somewhere around ages 55 to 65. The declining portion of the profile would reflect the tendency of these 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].

The household surveys from the 1880s and 1890s reveal that industrial workers with modest incomes did save significant proportions during their peak earning years [Sutch 2011]. Those surveys however only encompassed currently employed workers. They include very few men 65 and older. I am not able to observe the late-life period of retirement, where I might observe the dissaving predicted by the life-cycle model. Data on wealth however spans all ages and includes both the employed and the non-employed. In 1870 the United States 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.[18]

I reexamine the 1870 data, not only because that is the sole source of Piketty's quantitative evidence on the Gilded Age, but also because 1870 is the ideal date to ask whether Piketty's inheritance model can shed light on the nineteenth-century accumulation of wealth. The year 1870 was at the outset of the Gilded Age and so can be expected to provide the most scope for a strong bequest motive to reveal itself. The rise of life-cycle savings had only begun in the second decade of the century and the transition away from traditional systems of family support had necessarily been gradual, occurring only as successive cohorts of young urban households took up the new strategy [Sutch "Philanthropic," 2015, Carter, Ransom, and Sutch 2004]. It is likely that only a fraction of American households would have adopted the new individualistic approach to old age protection by 1870.[19] Since the great fortunes of the nineteenth century were

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[18] 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.

[19] Some analysts think of the life-cycle model of saving as applicable only to the period after World War I when planned retirement became increasingly common [Darby 1979: 22-28, Costa 1998: Chapter 2]. Roger Ransom and I, however, have traced life-cycle saving back to the second decade of the nineteenth century and suggest that life-cycle savings was considered a prudent accompaniment of industrial employment and urban living [Ransom and Sutch, *JEH*, 1986, and 1995; and Sutch 1991and 2006: Volume 3, 291-293]. Also see Steckel [1992], Carter,

a new phenomenon, the consequence of technological advances, exploitation of economies of scale, revolutionary financial developments, the rise of corporations, and the monopolizing reorganization of industry, I expect the early captains of industry to be "self-made men," with the personality type most likely to harbor dynastic ambitions. In other words, the 1870 data biases the findings in favor of the Piketty hypothesis. After all, a dynastic bequest motivation would be a holdover from the traditional family-based security systems that imposed an obligation on the family patriarch to preserve and pass on the family farm in exchange for old age support from his presumptive heirs [Bisland 1897: 41].

Interpreting the nineteenth-century wealth data is comparatively straightforward. Modern data is complicated by the existence of social security, pension funds, tax distortions, government subsidies to pension contributions, a developed annuities market, and the routine reliance upon expensive late-life medical interventions [DeNardi, French; and Jones 2015]. America was innocent of these institutions in 1870. We can hope to see in that year the impulse behind wealth holding naked.

It may help to clarify what I will be looking at. It is wealth, not capital. With the title of his book, *Capital*, Piketty created some confusion evident in the outpouring of criticism flooding the blogosphere. "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 evaluated at current market prices. 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

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Ransom, and Sutch [2004], and Haines, Jaremski, and Hacker [2014]. The soaring popularity of tontine insurance, an ingenious self-financed pension scheme, during the Gilded Age testifies to the power of retirement and precautionary motives for motivating saving in that era [Ransom and Sutch 1987]. On "retirement" trends in the late nineteenth and early twentieth centuries see Ransom and Sutch [*JEH* 1986 and 1989], Ransom, Sutch, and Williamson [1991], and Carter and Sutch [*Historical Methods*, 1996].

benefits and human capital. Piketty's focus is on *marketable* wealth held by individuals, because only marketable wealth can be passed onto heirs.

The census inquiries about wealth in 1870 probably elicited responses that are acceptably close to marketable wealth as defined by Piketty. Only two differences seem important.[20] The census asked about gross wealth, rather than net wealth, ignoring any offsetting debts. However, bank-financed mortgages were uncommon before 1870. Indeed most borrowing at that date would be by enterprises and a business owner would likely estimate the value of a firm on a net basis: roughly its marketable value. Borrowing by individuals was generally from family members or trusting friends. These lenders would more often than not be in the same wealth bracket as the borrower, so there is probably only a modest distortion of the concentration of net wealth arising from this difference. Piketty excludes consumer durables, including automobiles, from his twentieth-century data. The 1870 census included durables. Of course, there were no automobiles in 1870, but their functional equivalent – horses, buggies, and carriages – were important and were included. The other widely-owned and quantitatively significant class of household durables were musical instruments, significantly pianos. The Gilded Age was all before the "consumer durable revolution" of the 1920s. Ownership of carriages and pianos were concentrated at the upper reaches of the wealth distribution, so relative to twentieth-century estimates, the 1870 data is likely to exaggerate the concentration of wealth.

Ideally one would want to examine saving behavior with a longitudinal cohort study that made repeated observations of wealth, income, and consumption over the entire adult life span of 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. Finding even one example from the nineteenth century preserved in an archive would occasion my surprise.[21] Actuaries creating tables of life expectancy face a similar difficulty. They rarely

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[20] The data appendix describes the census data in detail and discusses some of the interpretive issues that arise.

[21] I hope to generate a crude substitute for a longitudinal panel by assembling a collective financial biography of some of the top wealth holders of 1870.

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. For a given year actuaries 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 hypothetical person's life expectancy. This is essentially what I do by examining the wealth of a cross section of households in 1870 and interpreting the profile of wealth by age as if it represented the wealth profile of a typical household as it aged. The cross section serves as a "synthetic cohort."[22]

I have aggregated the census data for each family member into households and assembled a "core sample" consisting of all households headed by an individual born outside of the former slave states. The southerners are omitted because many of them were newly freed slaves or their former owners. Neither of those groups had achieved a new wealth-income equilibrium only five years after the end of slavery [Ransom and Sutch 2001 and 1988]. **Figure 3** displays the 1870 wealth-age profile of household wealth for this "core sample." For each single year of age I plot the median level of family wealth using a linear scale for the vertical axis. I have superimposed a polynomial curve to fit the data.[23]

Figure 3. Median Family Wealth by Household Age
Core Sample, 1870
(linear scale)

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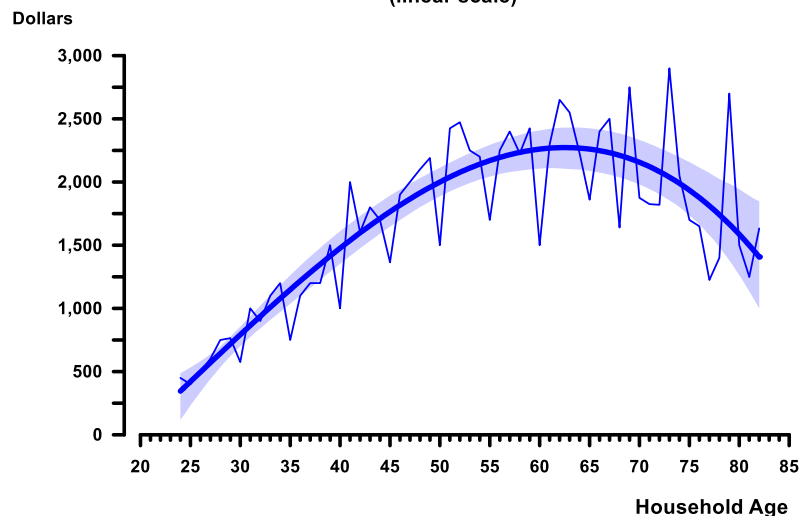
[22] There are obvious pitfalls in using this technique since it assumes (contrary to fact) that the behaviors of and the circumstances encountered by each generation are similar. Briefly put these pitfalls include confounding cohort effects, possibly strong period effects, cohort-specific life-time shocks, and a possible correlation between wealth and mortality. In data appendix the potentially confounding effects relevant to our study are discussed as a warning against misunderstanding.

[23] I have added the 95-percent confidence intervals around the smoothed estimate. This is the confidence interval around the polynomial curve assuming that each observation of the median wealth is precisely measured. Since we

The median household wealth rises from about $400 at age 24 to around $2,225 at age 60. Thereafter median wealth declines, as predicted by the life-cycle model. 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 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.

"Household age" is defined to be the age of the household head or the age of his wife if she was younger. When a couple is engaged in life-cycle planning, the age of the youngest member of the pair is relevant to set the target wealth desired on the date of the husband's retirement. Typically men married women younger then 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. This sift is consistent with a life-cycle model in which *the couple* are engaged in life-time consumption smoothing and prudently saving for an extended life span.

At older ages the wealth reports come from two distinct groups: those that remain at work earning labor income and those no longer employed. Most households in the first group would be taking in sufficient income to avoid the need to dissave while the second group would have entered the dissaving phase of their life cycle. This combination 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 were among the nonemployed in 1870 with any precision, however, is probably not possible. The basic problem is that the census assigned each individual "to their

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have only a 1-percent sample of the 1870 Census, there is also a sampling error attached to each observation that is not taken into account. A lowess fit with a band width of 0.4 has essentially the same shape as the third-degree polynomial shown.

habitual occupation, whether it is being at the time
pursued or not" [U.S. Census Office, Ninth Census,
Wealth, 1870: 805].[24] Although the occupational
classifications included an unknown number of
nonemployed, it is still the case that many older men
did not report a specific occupation. I have plotted
the percentage of male household heads without a
reported occupation by age in **Figure 4**. The curve

Figure 4. Percentage of Male Household Heads without a Reported Occupation, 1870

begins to rise around age 55. Clearly men were shedding occupational identifications as they
reached advanced age. This late life non-employment, whether it was voluntary retirement or
involuntary unemployment, can be taken as the *raison d'être* for engaging in life-cycle saving
when young.
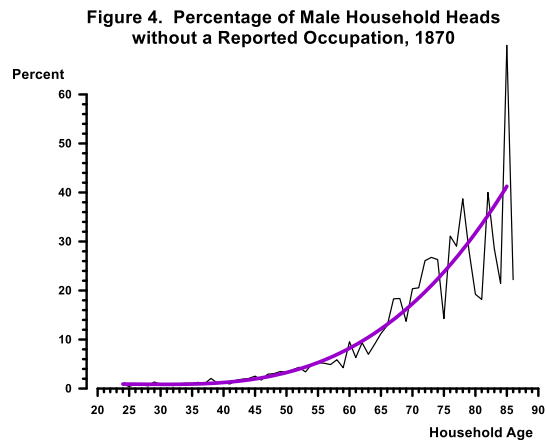
The Concentration of Wealth in 1870

Table 1 presents the percentage of the total wealth reported by the core sample in 1870 by
various percentiles of the distribution. I also display the threshold values of wealth that define the
boundaries between each group and the rest of the distribution. For comparison purposes the
table reproduces the estimates prepared by Emmanuel Saez and Gabriel Zucman based on U.S.
income tax returns for three years: the first year they report, 1917; 1986; and the last year, 2012.
The year 1986 is included because in that year the concentration of wealth was at its twentieth-
century low point [2015]. Interestingly, the 1870 figures are very similar to those for 1986.

Yet, it would be inappropriate to place heavy emphasis on the comparison of my estimate
for the top wealth shares with those estimated by Saez and Zucman. The figures for 1870

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[24] Matters are even more complicated when it comes to the occupations reported for men 60 and over. According to
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]. By contrast the one-percent sample of 1870 reports
occupations for 81.8 percent of males 60 and over. Susan Carter and I concluded that the Census Office edited the
original reports to remove older men who reported an occupation but were not employed [1996]. 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].

measure gross wealth while Saez and Zucman 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 I knew those numbers (or made a back-of-the-envelope calculation), it would raise my estimate. My figure excludes the data for the former Slave 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 a census taker whose own wealth would fall closer to the middle of the distribution. When a man's extreme wealth could not be denied, he might have refused an answer because he resented the intrusion of the questioner. Cornelius Vanderbilt, at age 76 in 1870, was probably the wealthiest man in America at the time, yet the columns recording wealth are blank on his census return. Although doubtless some evaded the income taxes imposed in the twentieth century, they did so under penalty of law.[25]

The hump shape predicted by Modigliani is clearly evident in Figure 3 and the rising rate of non-employment in Figure 4 suggests the attractiveness of a life-cycle saving strategy. Not every household would have to engage in saving. There was an alternative. I might estimate how many households were following a traditional strategy where grown children and other family members were relied upon for support in old age. 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 [Ransom and Sutch 1995, Sutch 2011]. 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 household wealth would constitute evidence that life-cycle assets were sufficient by, say, age 60? The answer depends upon the

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[25] 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 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.

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.

Most households did not retire at age 60. Approximately two-thirds of men 60 and over continued to work [Carter and Sutch 1996: 17]. 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 each year 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 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. 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. **Figure 5** plots the percentage of households that owned at least $1,000 at each age. At that threshold 33.4 percent of the households had not saved enough by age 60. This is an overestimate of the number households without a saving strategy. Some households recorded in my sample with less 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.

Figure 5. Percentage of Households that Own at least $1,000 of Wealth, 1870
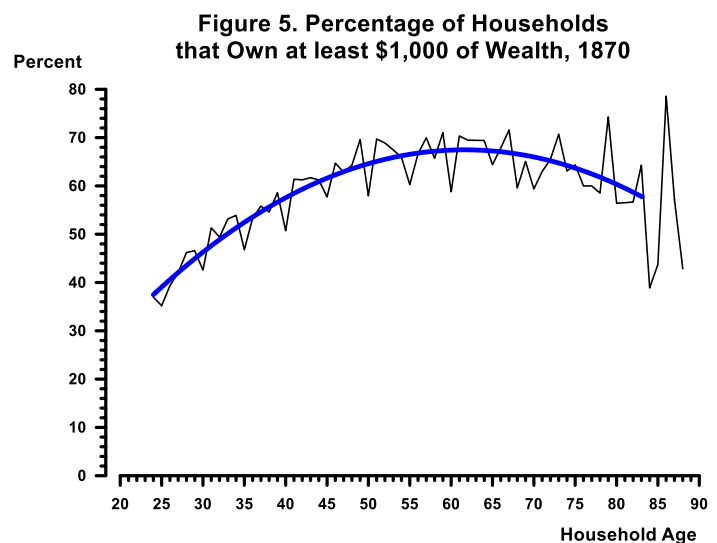
An alternative estimate of those failing to follow a life-cycle strategy would be to count the number of older individuals without wealth living in a household of one of the individual's grown children. It is likely that this living arrangement was of necessity since over two-thirds of men and nearly 90 percent of women living in a child's home reported owning no wealth.

Figure 6. Percentage of the Elsderly Population Living with Children and without Wealth, 1870
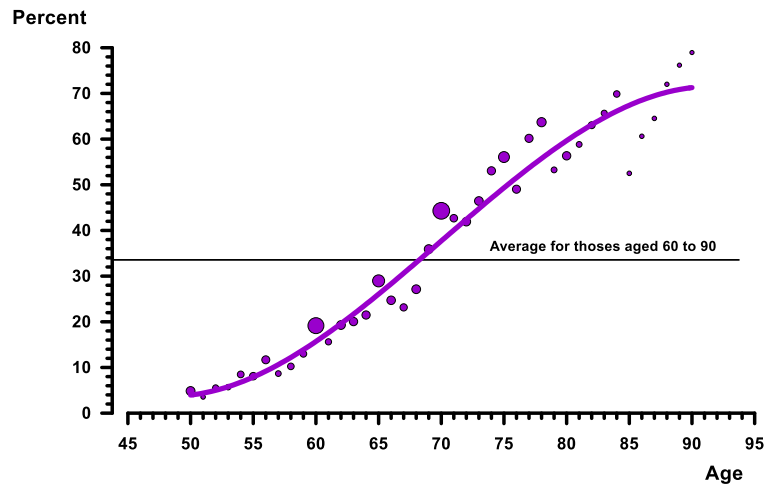
wealth. **Figure 6** displays the percentage of the elderly population (born outside of the south) living with a grown child and with reported wealth of less than $100.[26] At the ages 50 to 65 these individuals were either following the traditional strategy all along or were unsuccessful in accumulating 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.

I conclude that at least two-thirds of elderly Americans had sufficient wealth to have been successful life-cycle savers. One-third were not adequately prepared for an independent old age. 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

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[26] The size of the bubble plotted at each age is proportional to the number of individuals reporting.

work to supplement the household income. At work, rather than in school, the children will reach adulthood with limited skills and 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.

Figure 7 plots a smooth curve tracing out the twenty-fifth percentile boundary of the wealth distribution for each age.[27] 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 these families evidently were forced to dissave at a rapid rate. By age 80 their wealth was exhausted.


Figure 7. The 25th Percentile of the Wealth Distribution Core Sample, 1870

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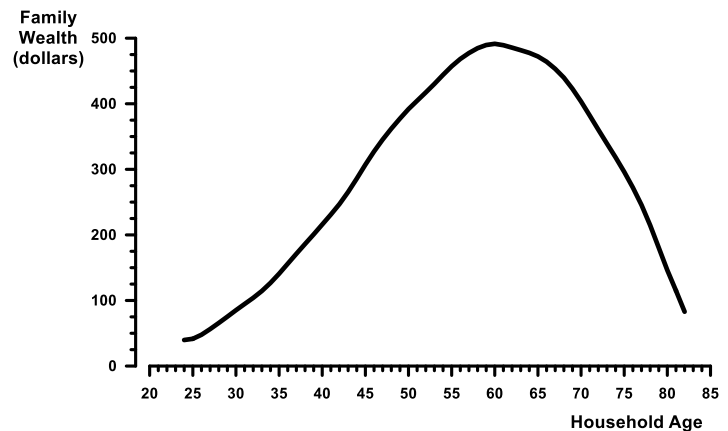
[27] The lowess smoothing technique with a band width of 0.4 was used. Lowess (locally weighted scatterplot smoothing) is desirable because it uses only nearby values of the variable of interest, thus allowing a closer fit to the data.

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 8** 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

**Figure 8. Top Percentiles of the Wealth Distribution Core Sample, 1870**
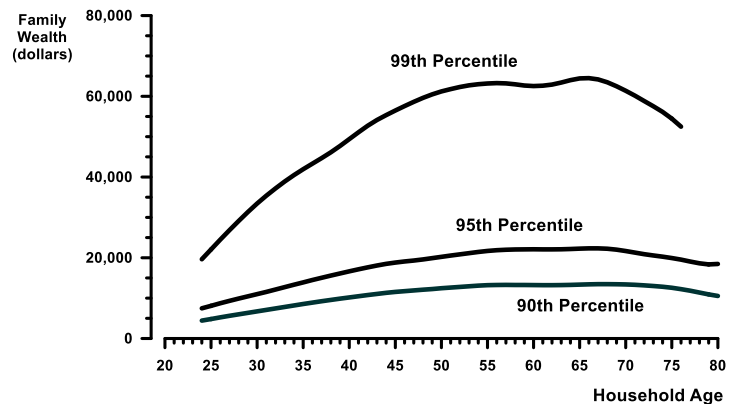
reported owning 26.7 percent of the wealth recorded by the census. Although lower than estimates of that percentage for the U.S. today (see Table 1), this is still a large number. Even as early as 1870 the Gilded Age was notable for its disparities in wealth.

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 but was difficult to liquidate piecemeal. 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 entrepreneurial wealth swamped their life-cycle wealth and overwhelmed their bequest wealth.

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 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 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 9**. Modigliani's

Figure 9. Family Wealth by Household Age
Core Sample Excluding the Poor and Rich, 1870
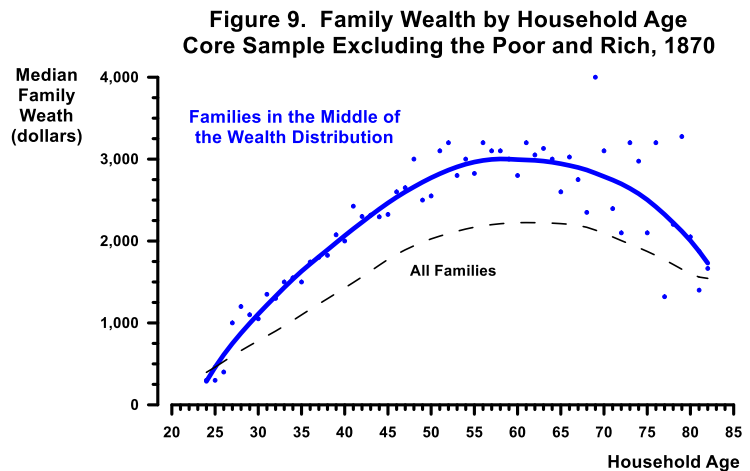
signature hump shape is pronounced. The peak is reached at age 58. The median wealth holding of this middle-aged middle-class group reached the equivalent of over 8 years of an industrial worker's income! I conclude that a majority of Americans were accumulating wealth at levels that would sustain them in old age as their incomes fell without the need to rely upon their grown children. The wealth distributions of the middle class were consistent with a primary motivation to have been – contra Piketty – saving for retirement and unforeseen emergencies. But I also suggested that there were a minority who held more wealth than can be easily explained by life-cycle motives. We need to better understand the motivations for retaining so much.

Inheritance in the Gilded Age: The Literary Evidence

In American usage the proverb "from shirt-sleeves to shirt-sleeves in three generations" was often evoked to draw a contrast between American attitudes about saving and bequests and the

European way.[28] Consider this discussion of inheritance by Elizabeth Bisland writing for the *North American Review* in 1897.[29]

> 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. … 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: 39-40]

Bisland is describing parents without the taint of a bequest motive – life-cyclers in short. And she does not exclude the 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].

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

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[28] 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].

[29] Bisland was a pioneering female journalist and literary editor for *Cosmopolitan Magazine*. She was famous for her 1889 attempt to beat Phileas Fogg's around-the-world record of 80 days in a race against another female reporter, Nellie Bly. She beat the fictional record completing the circumnavigation in 76½ days, but Bly won the race by four days [Bisland 1891].

available.[30] 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].

Many observers thought that the American way with wealth as described by Bisland advanced American democracy and the values of self-reliance and enterprise. The increasing concentration of wealth at the very top had become evident in the final years of the Gilded Age and was, as a consequence, of serious concern. Irving Fisher, the Yale economist and a public intellectual, expressed fear that an undemocratic distribution of wealth "threatened the very foundations of US society" [Fisher 1919: 13, the quotation is a paraphrase by Piketty 2014: 506]. Yet, while Fischer thought that savers would amass wealth throughout their life, he did not believe that they did so to leave an inheritance.

> 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]

Bisland's confident testimony about the lack of bequest motives at the end of the nineteenth century is certainly limited and anecdotal. Fisher's credentials as an expert economist (his comments are from his Presidential Address to the American Economic Association) are not sufficient to give him much credibility today. He had not conducted empirical research on the matter and his armchair theorizing about wealth accumulation would not pass current muster.[31]

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[30] Bisland was no outsider to the wealthy class. She married Charles Whitman Wetmore, a New York lawyer, in 1891 who retired that year at age 38. The couple then built a famous estate on Long Island's gold coast, "Applegarth," situated on 63 acres on Centre Island in Oyster Bay. In 1900 the main house lodged the couple, two maids, a cook, and a laundress. Adjacent housing accommodated their gardener, a coachman, two laborers, and another cook [Aspinwall 1903, Bisland 1910, L. 2012, and Ancestry.com, 1900 United States Federal Census [database on-line]. Oyster Bay, Nassau, New York; Roll: 1079; Page: 5B; Enumeration District: 0732; FHL microfilm: 1241079, Ancestry.com, 2004].

[31] Fisher was a committed eugenicist who thought that character traits such as criminality, lasciviousness, and recklessness were heritable. So too, he thought that a worker's quantity of patience could be taken as given – locked in his genes. Savers, Fisher thought, were simply men with inborn rates of impatience less than the market rate of interest [Fisher 1912: 479 and 487]. Fisher was the founding President of the American Eugenics Society which aimed to improve the human population through carefully controlled breeding. His writings on this subject are an awkward blend of pseudoscience, racial and class prejudice, and doomsday forecasting [Fisher 1921; Fuchs 2005:

But these observations support my quantitative research findings. The saving data for working-class men I presented elsewhere suggests that industrial workers of the late nineteenth century engaged in significant life-cycle saving despite their modest incomes [Sutch 2011]. The age-wealth profiles of households for 1870 displayed in Figures 3, 7, 8, and 9 have the hump shape characteristic of life-cycle accumulations. The astounding popularity of annuitized forms of wealth, such as tontine insurance, and company pensions, suggest that for many Americans bequest motives were weak [Ransom and Sutch 1987, Ransom, Sutch, and Williamson 1993]. I conclude that intended bequests, while perhaps important for the super-rich, did not play a significant role in the wealth accumulation of most people during the Gilded Age.

Super-Large Inheritances in the Gilded Age:
**Evidence from Wills and Probate Documents**

What about the super-rich? It is possible that they (or at least many of them) were an exception to the generalization that bequest motives were weak in the nineteenth century. There is some modern evidence that this might be so. Appropriately-specified tests of the life-cycle model using data from the twentieth century provide 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, 1997: 932, and 2003; 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, about 20 percent, do not display saving behavior that would generate the wealth humps predicted by the life-cycle hypothesis. 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 recently released digitized collection of wills and probate documents by Ancestry.com provide an exciting opportunity to investigate the origins and distributions of the fortunes of the super-rich during the Gilded Age. Since this data base was only opened on line this past September, it is too soon to offer a clear answer to the questions that I would like to ask.

416-417]. In his economics textbook he advocated enforced celibacy, by isolation in institutions, and surgical sterilization for those he regarded as defectives [Fisher 1912: 476].

I have only begun – but not finished – an exploratory dig into this evidence. I employed the 1870 wealth data from the one-percent IPUMS sample to prepare the list of the top 50 wealth-holding families presented in **Table 2**. Following Piketty I might tentatively define the super-rich as those occupying the top 1 percent of the wealth distribution. My core sample contains 48,754 families, so the top 1 percent include 488 cases. To be in the top 1 percent a family would have to own at least $44,000 (see Table 1). My top-50 list represents only the tip, the top 0.1 percent of families, families reporting assets exceeding $192,000.

The first point of note is that most of those on this list fall between the ages of 38 and 65.[32] That age group is where I would anticipate life-time wealth to peak for savers with modest bequest motives. Only one, Israel Morris (number 39) is very old, 93. But this Morris is a special case since he is the father of the other Morris on the list, Wister Morris (number 6). Two of the men in their mid-60s, Akin (number 25) and Herancourt (number 31), had much younger wives and so may not have yet ceased to save. **Figure 10** displays the distribution of the 50 cases by household age (black line). Household age is a better indicator of the stage of the life-cycle than the head-of-household's age, I have displayed the distribution as a smooth third-degree polynomial. It peaks in the late 30s and declines sharply at older ages. For contrast the blue line in the figure is the household-age distribution for the entire core sample. Also shown is the distribution for the top 1 percent (red line). The age concentration of the super-rich is very marked.

Figure 10. Density of Household Ages of Three Wealth Categories, 1870
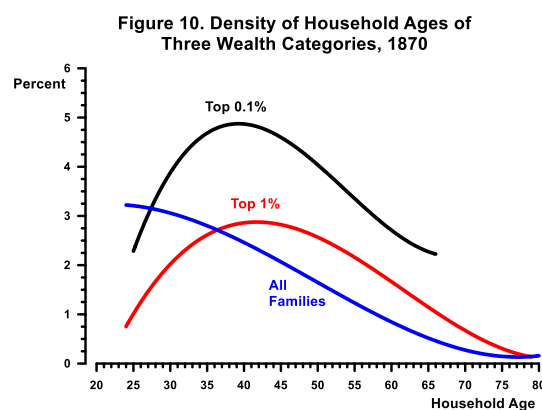
When considering the super-wealthy, cohort effects may not be easily dismissed. The elderly in 1870 worked and earned in an earlier era. A 65-year old in 1870, for example, would have spent the majority of his working years between 1825 and 1860 when technological or

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[32] The ages reported in the table are the age of the head of household, not the household age.

institutional conditions might have been less rewarding to entrepreneurial effort and less conducive to creating a fortune for the successful. It is as important to investigate the origins of the fortunes of the top 0.1 percent as it is to discover the disposition of those fortunes.

My goal is to research each of the names on the top-50 list to create a "collective financial biography" of the super-rich of 1870. Although the available time has only afforded a glimpse into the lives of a dozen of the rich and famous of 1870, I would like to record a few impressions. First, it does seem possible to form an opinion about the motives of these families for holding so much wealth. In a few cases, the individual inherited from his father or husband. Far more often the fortunes were the product of a highly successful entrepreneurial effort by the individual at the head of the household. The owner of the business may well have thought that he could not liquidate the concern without threatening its viability. Veblen held that "Pecuniary success is the final test of manhood" [1918: 82]. With their ego invested in the future as well as the present success of the business, the failure to sell and the inclusion of the business in the decedent's assets can be considered a manifestation, in Irving Fisher's words, "of power, of self-expression, of hunting big game" [Fisher 1919: 12]. What I typically find in these cases is that the business is not willed to the widow or children outright but is placed in trust, continued as an on-going concern, and a portion of the profits used to finance a life annuity of a specified amount for each of the heirs. With that arrangement the heirs could live comfortably but would not themselves inherit a dynasty.

It is also clear, even at this early stage, that drawing a conclusion about motives from the details that can be easily documented will necessarily be subjective. This raises the possibility that generalizing from even a more thorough and extensive financial biography of the top 0.1 percent will not be straightforward. The results will inevitability carry some ambiguity.

Some quantitative historians might feel that a study of the top 0.1 percent based on the present one-percent sample of the 1870 census yields too small a sample (only 50 families). We might wait for the University of Minnesota group in charge of the IPUMS samples to expand the sampling frequency for 1870, possibly with an oversample of the very rich. Without waiting for that effort, I propose that those interested in the issue at stake collect a supplemental "snowball sample." The super-rich tend to live as neighbors to other very wealthy individuals. The original

manuscripts of the 1870 census allow us to look at those neighbors who appear several pages ahead of or following one of the 50. The supplemental sample might include all neighbors reporting more than $192,000 of wealth. That number is just below the wealth reported by number 50 on my list. This approach will generate a second sample exhibiting a wealth distribution that will probably be different from that of my core sample because the wealthiest family on my top-50 list may live in a neighborhood (Madison Avenue in New York) with different characteristics than that of the fiftieth family (rural Rockland County, New York). If so, tests to detect bias in the snowball sample and differences between it and the core sample should be devised.

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." They are 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. The person living on rents in America was so infrequently encountered that he or she is described in American English with a French noun. Most farms and plantations in the nineteenth century were owner occupied and most landlords were part-time landlords, corporations, or beneficiary trusts. The rents part-time

landlords received supplemented income from their day jobs. Corporations can live forever and don't leave bequests, intended or otherwise. The trusts established by will were often designed to survive for several generations before dissolving.

Americans have long believed in a form of "American exceptionalism" in which the industrial classes were better off than in Europe. 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 was written near the end of the Gilded Age. The lack of a bequest motive would put a Parisian "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 when Modigliani and Brumberg proposed the model. As far as I can tell, those rentiers that were around in the 1950s typically spent their rents and saved little. Piketty has a different picture. Rentiers in his view (by definition?) amass wealth, their fortunes grow, and that must mean that the rents they receive exceed their consumption. But why should that be? 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.

In the cases examined so far, the wills typically treated all of the decedent's children equally or nearly so. Unlike Europe where custom or law gave the eldest son the bulk of the estate, in America even very large fortunes were frequently fractured and partitioned into several small fortunes.

Entrepreneurial Motive for Holding Wealth: A Tentative Hypothesis

It would surely be premature to offer a conclusion based on the few families in the top 0.1 percent investigated so far, but it might be worth stating a tentative hypothesis to help direct this type of genealogic research. Almost all of the recent statistical analysis and debate about the behavioral motive for saving has focused on three not-mutually-exclusive explanations: the retirement motive, the precautionary motive, and the bequest motive. The life-cycle insight, which combines the retirement motive and the precautionary motive, might seem both simple and obvious and the bequest motive less so, but there are other possibilities worth exploring. I suggest adding an "entrepreneurial motive" – the desire to create and expand a successful business enterprise. This motive would be particularly relevant for the Gilded Age when new technologies and new forms of business organization were driving rapid industrialization, economic growth, and piling up fortunes in the hands of successful entrepreneurs.

This idea is not new. John Maynard Keynes, the great macroeconomist of the twentieth century, mentioned this possibility very briefly in *The General Theory of Employment, Interest and Money*. The entrepreneurial motive was included as number six in a list of eight subjective incentives which might lead individuals to refrain from spending: "(vi) To secure a *masse de manoeuvre* to carry out speculative or business projects" [Keynes 1936: 107-109].[33] Keynes seemed to enjoy seasoning his prose with obscure French phrases. A "masse de manoeuvre" is a French military term for a body of troops held in reserve. Its extended use in English can denote any force held in reserve, a "strategic reserve" [Schultz 2012: 217]. Keynes did not elaborate and

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[33] Keynes labeled the first two motives "Precaution" and "Foresight." These are the two that animate the life-cycle model. And Keynes noted that the positive motive to save 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." The third and fourth motives, "Calculation" and "Improvement," together describe what Irving Fisher called "patience" [Fisher 1912: 478-481]. The fifth, to "enjoy a sense of independence and the power to do things" echoes Thorstein Veblen. Number seven was "to bequeath a fortune." "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 agreed. "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].

little notice has been taken of strategic business motives for accumulating wealth, perhaps because so few readers were conversant with French military tactics.[34]

The owner of a business, the "entrepreneur," will consider the value of that business as part of household wealth yet he may feel that it is essential to maintain the business intact and under personal control. The annual income received either as salary or dividends could be consumed or saved as desired, but the wealth tied up in the business could not be spent without harming the on-going concern. I suspect that in the nineteenth century institutions that permitted a separation of ownership and control were rudimentary and clumsy. So far I have found no evidence that a business founder was successful in continuing as the chief executive officer of his company while selling off his ownership either piecemeal or in its entirety. To sell the business was to retire and that would entail drawing down the proceeds to finance household consumption in retirement. If the owner intended never to sell, then he or she would have no reason to save for retirement.

Conclusions

Thomas Piketty has suggested that the increasing concentration of wealth in the late nineteenth century was driven by a perverse dynamic: the desire of the rich and successful to accumulate their wealth in order to bequeath a fortune. I find little to support that notion. There is 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.[35] Because the prudent saver accumulates enough wealth to last to a very old age but typically dies prematurely, bequests were common. In fact they would be almost universal, though with magnitudes ranging from pitiful to enormous.

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[34] The first recorded use of the phrase with reference to finance in English, according to a Google search of millions and millions of books, was in 1927 where it referred to gold reserves held by the central bank of France. It appeared in English in only five other books before 1936. Keynes use may well be the first in English to refer to the illiquid wealth held by a business owner.

[35] This finding, based on a synthetic cohort derived from the cross section of households arranged by age, is robust to a consideration of possible confounding cohort effects.

There is anecdotal evidence that in the late nineteenth century bequest motives were 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, immiserating labor practices, and rampant corruption and insider dealing, may have greater importance.

In his analysis of the dynamics of inheritance, Piketty ignores the possibility that the owner of a great fortune might spend the entire flow of asset earnings on consumption. Certainly, the Gilded Age offers many examples of such extreme spending as a visit to the tourist attractions of Newport, Rhode Island, would reveal. The great fortunes created during the era of Big Business and monopoly were justified in the eyes of the fortunemakers as the fruits of their entrepreneurial drive and business acumen and were tolerated as such by the public. However, the same moral legitimacy did not attach to fortunes that were simply inherited [DeLong 2003: 48-50]. Andrew Carnegie asked:

> 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]

Famously, Carnegie's own solution to the problem of embarrassingly-high income was philanthropy. The wealthy man, he thought, had a 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." "The man who dies … rich dies disgraced" [1889 "Wealth": 661-662, 664]. Piketty ignores the possibility of honorific philanthropy in the modern world (his book's index does not contain an entry for "philanthropy"). Carnegie would think that Piketty is predicting a twenty-first century where the wealthy are neither dutiful nor wise.

Using too little historical information and neglecting the agency of the inheritor has led to a misunderstanding of life-cycle saving and an exaggeration of the importance of end-of-life bequests in the Gilded Age. Additional historical information can be mined from the recently released database of nineteenth-century wills and probate inventories. After a preliminary and partial excavation of this rich archive, I think that it will be possible to achieve some insight into the agency of the inheritor.

Table 1
Percent of Total Household Wealth Owned by Various Wealth Classes, 1870

| Wealth Class | 1870 Census of Wealth | | Saez and Zucman 2015 | | |
	Percent of Total Wealth	Threshold Wealth	1917	1986	2012
bottom 25%	0.32	100	---	---	---
bottom 33.3 %	0.72	300	---	---	---
bottom 50%	3.24	1,000	---	---	---
bottom 75%	16.01	3,575	---	---	---
bottom 90%	36.86	9,000	20.5	36.4	22.8
top 25%	83.99	3,575	---	---	---
Top 10%	65.14	9,000	79.5	63.6	77.2
Top 5%	49.40	14,780	67.3	48.6	64.6
Top 1%	26.65	44,000	41.1	25.1	41.8
Top 0.5%	18.96	70,005	34.8	18.8	34.5
Top 0.1%	9.40	192,200	22.0	9.3	22.0

Source: Author's calculations and Saez and Zucman 2015: Appendix Table B1.

Table 2. Wealthiest 50 Households in the Core Sample, 1870

Rank	Name		Age		Residence	Occupation	Family Wealth	Number of Live-in Servants
1	FREDERICK	BARREDA	45	Male	New York, NY	EX PERUVIAN MINISTER	1,500,000	15
2	AUSTIN	DUNHAM	64	Male	Hartford, CT	MERCHANT	1,042,500	3
3	ELBERT ELLERY	ANDERSON	36	Male	New York, NY	LAWYER	1,010,000	4
4	GEORGE O	HOVEY	61	Male	Boston, MA	COMMISSION MERCHANT	915,000	6
5	SAMUEL	CRIM	52	Male	San Francisco, CA	REAL ESTATE BROKER	800,000	1
6	WISTER	MORRIS	54	Male	Montgomery Co., PA	IRON MASTER	680,000	0
7	MARTHA A	LONG	40	Female	New York, NY		650,000	0
8	HENRY R	REMSEN	61	Male	New York, NY	RETIRED MERCHANT	550,000	3
9 *	MAGDALENA	KOCK	34	Female	New Orleans, LA	KEEPING HOUSE	500,050	4
9 *	LAZARUS	SILVERMAN	40	Male	Chicago, IL	BANKER	500,000	3
11	THOMAS	COSGROVE	62	Male	Providence, RI	DRY GOODS MERCHANT	450,000	1
12	JULIA H	BILLINGS	43	Female	New York, NY	KEEPING HOUSE	425,000	5
13 *	NATHAN	COWRITH	52	Male	Chicago, IL	RETIRED BANKER	400,000	3
13 *	FREDRICK	GOODRICH	34	Male	New York, NY	ATH	400,000	6
15	CHARLES W	SMITH	41	Male	Worcester, MA	MFR OF COTTON GOODS	375,000	7
16	? HAPSIA B	MUDGE	66	Female	Covington, KY	KEEPING HOUSE	350,000	1
17	B	CRICKHAND	65	Male	Saint Louis, MO	RETIRED STONE MASON	340,000	1
18	ROBERT B	GRAY	43	Male	San Francisco, CA	JEWELRY MANF	335,000	1
19 *	JOHN B	FRISBIE	47	Male	Solano Co., CA	LAWYER	330,000	0
19 *	CHARLES	HERMAN	44	Male	Saint Louis, MO	W MERCHANT	330,000	1
21 *	C M	WEBER	57	Male	Stockton, CA	CAPITALIST	300,000	0
21 *	EDWARD C	WILSON	55	Male	Norfolk Co., MA	RETIRED MERCHANT	300,000	0
23	CHARLES	WILLING	54	Male	Philadelphia, PA	RETIRED PHYSICAN	295,000	2
24	JONA N	HARRIS	55	Male	New London Co, CT	RETIRED MERCHANT	285,000	0
25	ALBERT	AKIN	67	Male	Dutchess Co., NY	BANK PRESIDENT	282,000	0
26	GEORGE	BAILEY	42	Male	Philadelphia, PA	DOCTOR OF MEDICINE	272,000	3
27	JOHN	VOORHIST	47	Male	Fairfield Co., CT	QUARRY MAN	270,000	4
28	LAWRENCE R	JEROME	48	Male	New York, NY	BROKER	268,050	3
29	JESSUG W	SCOTT	71	Male	Toledo, OH	RETIRED LAWYER	260,000	0
30	AUGUSTUS	SMITH	39	Male	Whiteside Co., IL	DEALER IN REAL ESTATE	252,000	0
31	G M	HERANCOURT	63	Male	Cincinnati, OH	BREWER	250,000	1
32	ISAAC H	GRAY	55	Male	Springfield, IL	RETIRED MERCHANT	245,000	1
33	JERMAN	KEATOR	47	Male	Rock Island Co., IL	LUMBER MFR	230,000	2
34	PHILANDER	ARMSTRONG	45	Male	New Haven, CT	WEST INDIA IMPORTER	225,300	2
35	JOHN M	CLARK	33	Male	Chicago, IL	LEATHER DEALER WHL	225,000	2
36	WILLIAM	CONSELY?A	60	Male	Brooklyn NY	GENTLEMAN	220,000	1
37	MAY	THOMPSON	50	Female	Cayuga Co., NY	BOARDING HOUSE KEEPER	212,500	1
38	T M	FINNEY	40	Male	St Louis Co., MO	EDITOR CHRISTIAN ADVOCATE	210,000	4
39 *	GEORGE	FINLEY	46	Male	Pittsburgh, PA	RETIRED SAND MERCHANT	202,500	0
39 *	ISRAEL	MORRIS	93	Male	Montgomery Co., PA	FARMER	202,500	1
41	ALFRED	WOLFF	29	Male	Cincinnati, OH	WHL DRY GOODS MERCHANT	202,300	0
42	THOMAS G	CARSON	53	Male	Berkshire Co., MA	PAPER MAKER	200,400	0
43 *	WILLIAM C	DUNCAN	50	Male	Detroit, MI		200,000	3
43 *	WILLIAM	HAWKS	56	Male	Columbus, OH	MAIL CONTRACTOR	200,000	1
43 *	HERM	LIVINGSTONE	42	Male	New York, NY	SHIP MERCHANT	200,000	6
43 *	PATRICK	O'NEIL	36	Male	Chicago, IL	WHL LIQUOR DEALER	200,000	0
43 *	HORACE J	PERRIN	49	Male	Calhoun Co., MI	BANKER	200,000	0
43 *	M F	REYNOLDS	56	Male	Rochester, NY	WHL HARDWARE	200,000	2
49	CADIS B	BOYCE	54	Male	Boston, MA	FURNITURE DEALER	195,000	0
50	JAMES	EKERSON	55	Male	Rockland Co., NY	BRICK MKR	192,200	1

* Tied

Data Appendix. The 1870 Census of Wealth: The Nature of the Data

I have come loaded with statistics …
Statistics – statistics—why statistics are more precious
and useful than any other one thing in this world,
except whisky – I mean hymnbooks.

Mark Twain, "Political Speech,"
Republican Rally, Hartford Opera House
October 26, 1880[1]

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.[2] While a compromise was sought, the bill authorizing the census was held in abeyance. After the issued was settled by the Fifteenth Amendment in February of 1870 giving the former slaves the right to vote, 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].

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

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[1] Included in Paul Fatout [1976: 140].

[2] 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.

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.[3]

Figure B1 reproduces a portion of the enumerator's manuscript for the city of Buffalo, in Erie County, New York.[4]

Figure B1. Reproduction from the manuscript returns of the 1870 Census

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

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[3] 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].

[4] Source Citation: 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 the one-percent sample available from IPUMS.

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 dictated many years later 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].[5] It is a sample of one, to be sure, but here the written memoire is consistent with the census record.

Reliability

The data on wealth were self-reported. The responses given tend to cluster at round numbers (hundreds or thousands) strongly suggesting that they were estimates. They would have been made by the household member being interviewed and that individual may not have been the best informed. Richard Steckel compared a sample of the 1870 returns from the Massachusetts towns or cities of Boston, Salem, Lexington, Westminster, and Sturbridge with the taxable wealth established that year by the municipality's tax assessor. Judging from the scatter diagram presented the correlation between the two is surprisingly high [Steckel 1994: Figure 1, p. 76]. There was a systematic tendency for the wealth reported by the census to exceed the taxable wealth but this may be attributed to the under-appraisal of real estate values by the tax authorities as was customary in the nineteenth century. Other considerations are the possibilities that some of the family's wealth was located outside of the tax jurisdiction and that in some cases the wealth owned by separate members of the household were assigned to the household head by the census enumerators. It is also plausible that some individuals would hold an inflated view of the value of their property. There are a minority of cases where the two values differed greatly. The majority of these were when the census reported zero wealth (that is total wealth less than $100), but the appraisals for taxes were substantial. This discrepancy most likely arises because of

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[5] The census-taker's informant was probably Olivia. Her age and birthplace 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].

enumerator sloppiness or a refusal of the informant to respond to the question. There were a smaller number of cases where no taxable wealth was recorded but the census informant claimed a substantial amount. This raises the possibility of tax evasion. But, if so, that would not imply that the census estimate was unreliable. Steckel reports that the two measures of wealth have similar size distributions with similar Gini coefficients [Steckel 1994]. Based on this comparison, I conclude that the census data will provide an accurate picture of the cross section of wealth ownership in 1870.

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. 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 had 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 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. The bias from using data on gross wealth rather than net wealth will be small.[6]

Consanguineal Families

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[6] 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].

The wealth variable I calculated 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.[7] The immediate consanguineal family is defined to consist of the household head, his spouse, their unmarried children and 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 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.[8] The couple was obviously a beneficiary of Olivia's father's generosity.[9]

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.[10]

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[7] This unity of economic interests might be by choice or be imposed by the family patriarch.

[8] 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].

[9] 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: 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.

[10] For details on the imputation procedure see Ruggles *et al* [2010: Chapter 5 of "IPUMS Design"]. When those rules proved an ambiguous guide the IPUMS team employed a "hot-decking" procedure linked to the 1880 census

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.[11] 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. In the nineteenth century few married women with a spouse present worked for wages. Typically men married women younger then themselves. In 1870 the average age gap was 4.7 years. 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. And, labor force participation by married women is much higher today, so the distortion produced by using the husband's age in studies with modern data would be less.

In the figures shown in the text 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 at 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.

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returns. 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.

[11] 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.

Born Outside the South

There are two reasons for excluding households headed by someone who was born in one of the slave states.[12] This rule excludes most former slaves who, as slaves, were legally unable 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 the slaves were freed their 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 the "normal" patterns of wealth holding and saving were specific to the era and to the southern-born.[13]

Medians Rather than Means

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

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

[13] Note that the sample I have drawn 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.   By excluding the bulk of the population residing in the South, I avoid any possible problems created by the difficulty of conducting the 1870 census in the former Confederacy [Hacker *et al.* 1999].

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. 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 following the traditional strategy. See **Figure B2**. By reporting medians rather than means, the results are completely free of the bias that would be produced by the $100 minimum.

**Figure B2. Percent of Households Reporting Zero Personal Estate, Core Sample, 1870**
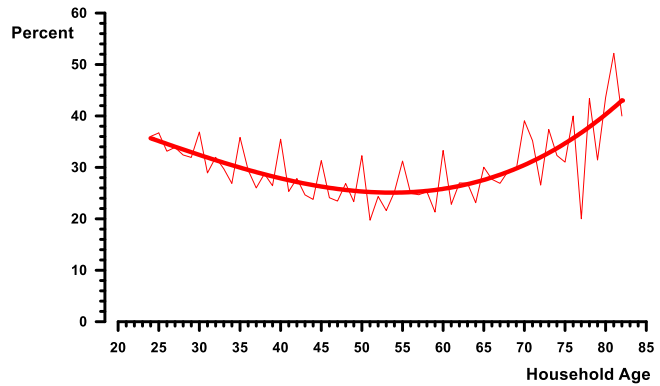
Estimating Personal Estate when Blank

There are two possible reasons for a report of zero personal property. Some will truly have 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 B3** 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 B3. The Rate of Illiteracy of Family Heads among All Households Reporting Zero Personal Estate, Core Sample, 1870
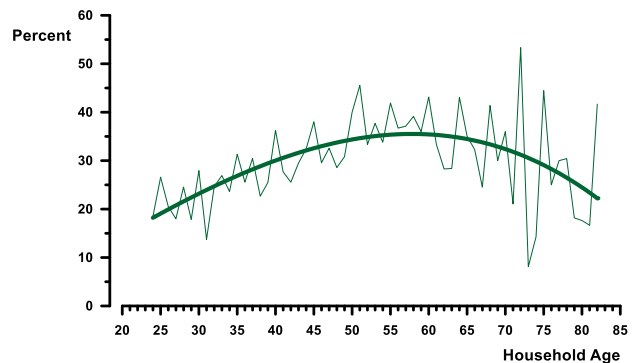
Since one of the research questions is to quantify the proportion of the population that had not yet adopted life-cycle saving behavior by 1870, it would be unhelpful to exclude observations of individuals with low levels of wealth. Therefore I have made a rough estimate of the personal estate for any household reporting zero personal estate. To obtain an idea of what amount the $100

**Figure B4. Average Personal Estate Reported by the "Poor"
Core Sample Families, 1860**
Households with less than $100 but more than zero dollars of personal estate
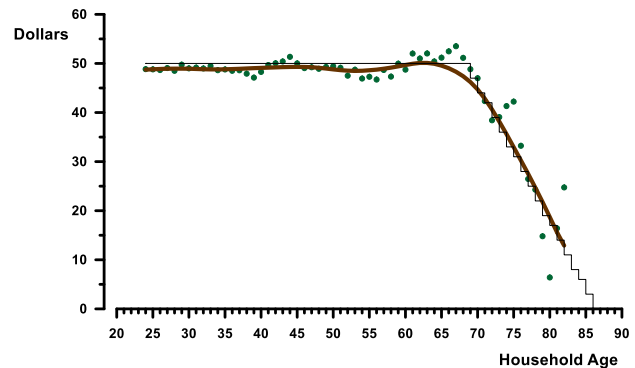
minimum might exclude I have turned to the reports from the 1860 census. In that year there was no minimum imposed on the personal estate question. The reports of the poor in 1860 can provide an order of magnitude for the personal estate holdings of the poor in 1870. **Figure B4** plots the average personal estate in 1860 for households that reported less than $100 but more than zero dollars.[14]   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.[15] 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.[16] 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

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[14] Timothy Conley and David Galenson examined the 1860 returns for Chicago and concluded that some enumerators imposed an idiosyncratic censuring at the low end reporting zero when the value was below some cutoff despite the fact that the 1860 instructions did not exclude reports of small amounts [1994].

[15] 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.

[16] 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.

trade.[17] For older households, I estimate their personal wealth would follow the declining stair

steps plotted in Figure B4. Making this adjustment which replaces zeros with a small number

does not, of course, change the median values reported. It will, on the other hand affect the total

volume of wealth and the average level of wealth holding.

Smoothing the Data

The medians at each age plotted in in the various age profiles of wealth 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 3 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 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], the smoothed curves would be nearly identical to the

polynomial.[18] Both smoothing techniques indicate a pronounced hump shape with a peak at the

same household age.

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

[18] 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.

Considering the Cross-Section Pitfalls

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 household. The behavior and circumstances of the young households in 1870 might not mimic the behavior and reproduce the circumstances of the old households when the old were young. 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]. Since we don't have the luxury of such data for the nineteenth century, I should take special effort to avoid being misled. The pitfalls are confounding cohort effects, strong period effects, cohort-specific shocks, and confounding correlation between wealth and mortality.

Confounding Cohort Effects

Obviously the old people whose wealth is reported in 1870 began their working life earlier in the century. 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 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 A** 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 [Ransom and Sutch 1995, Sutch 2011]. 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 (r>g). The rate of interest on New England municipal bonds was consistently above 4 percent throughout this period [Carter *et al.* 2006: series Cj1194]. 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.[19]

Strong Period Effects

One difficulty of using a cross-section observed at one point in time 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.

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 that remained loyal to the Union and those that joined the treasonous rebellion, the Civil War remains the bloodiest American conflict on record.

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[19] An alternative to using real wage data would be to use real gross domestic product per household (a crude measure of household productivity). This measure grew even less rapidly over the period under consideration [Carter *et al.* 2006: Series Ae1 and Ca9].

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 during their absence. 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 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.

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, Waldron 2007]. 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. [20] Then the winnowing of the poor at the higher ages would inflate the median wealth of the elderly. If this effect was strong in the nineteenth century, it would obscure the declining portion of the Modigliani hump and bias the results against the life-cycle hypothesis. On the other hand, the wealthy at that time may have been

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[20] However this relationship may be prominent only in data from the last decades of the twentieth century. The relative improvements in life expectancy for the wealthy seem to be related to their propensity to refrain from smoking and the advantages conferred by college education [Mears, Richards, and Cutler 2008].

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 as suggested by Richard Steckel and Carolyn Moehling [2001], then perhaps risk taking extended to engaging in life-threating adventures. This might weaken the wealth-longevity correlation or even turn it negative. There is, as far as I can find, 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. I conclude that this source of bias is unlikely to distort the age-wealth profiles in 1870.

Table A. 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.

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