

# Hard Work, Nonemployment, and the Wealth-Age Profile: Evidence of a Life-Cycle Strategy in the United States during the Nineteenth Century

Richard Sutch

University of California, Berkeley and Riverside  
National Bureau of Economic Research

Paper prepared for presentation at NBER  
Development of the American Economy, Program Meeting  
Cambridge, Massachusetts, March 5, 2011.

Preliminary Draft of February 17, 2011

## ABSTRACT

I examine a series of surveys of (primarily) industrial workers taken in the late-nineteenth century United States to support the proposition that life-cycle saving was common and that, as a consequence, saving rates of the working class were surprisingly high. The surveys have detailed information on income, wage rates, occupation, unemployment, self-reported “productivity,” savings, and also some limited information on asset holdings. There are also retrospective questions that allow me to examine how things changed for individual workers over time. Saving behavior in this era seems to have been motivated by the challenges that industrial workers of the time faced as they aged: declining incomes, more frequent and longer episodes of unemployment, and voluntary or unavoidable downward occupational mobility. While full retirement was also common for the very old, accumulated assets were primarily a protection against falling income and enforced idleness at a time when many elderly could not depend upon their grown children to support them. I supplement the worker surveys with evidence of wealth holdings from the public-use samples of the 1870 U.S. Census of Wealth material previously under-appreciated by economic historians. The information collected has, as should be expected, some deficiencies, but with due attention to the quality of the data and the conceptual problems that confound its interpretation, I am willing to proceed. The conclusions challenge the findings of life-cycle skeptics such as Michael Darby, Laurence Kotlikoff, Lawrence Summers, and others.

## ACKNOWLEDGEMENTS

The ideas presented here were given a preview at a seminar held at RAND in Santa Monica on October 18, 2010. I received a number of helpful suggestions and provocative suggestions from the participants. Thanks, too, to Todd Sorensen who sent comments even though he missed the presentation at RAND. This paper returns to a research topic that has interested me for many years. My early collaborators on the history of saving and retirement, Susan B. Carter, Roger L. Ransom, and Samuel H. Williamson, have been a constant source of inspiration and ideas, although none of them should be implicated in the conclusions of this paper. I should also like to thank my research assistant of some years back, D. Bradford Hunt. Some of his bibliographic efforts have only now born fruit.

*The aim of every normal man and woman is an old age free from care and want. To that end most of them toil patiently and live closely, seeking to save something against the day when they can earn no more. And yet the same fate awaits the overwhelming mass of them. In the life of the toiler there are weeks, and sometimes months, of enforced idleness, weeks of unavoidable illness, losses from cheating and swindling, and then, as age creeps on, from about his forty-fifth year, a constantly declining capacity to earn, until at 55 or 60 he finds himself helpless and destitute. There is hardly a more pitiful tragedy than the lot of the toiler who has struggled all his life to gain a competence and who at 60 years faces the poorhouse.*

Congressman Victor L. Berger (SDP-Wisconsin)  
introducing a bill to provide old age pensions in the  
62<sup>nd</sup> Congress, 1<sup>st</sup> Session, August 7, 1911.<sup>1</sup>

Congressman Berger, speaking in 1911, suggested that most Americans engaged in saving when during their prime earning years to “gain a competence” with which to finance consumption later in life. But he laments the fact that many did not achieve the goal of maintaining a comfortable living in retirement because of misfortune, ill health, extended late-life unemployment, and declining incomes after age 45.<sup>2</sup> This paper is my attempt to persuade the reader that life-cycle saving was common at the end of the nineteenth century as Berger describes and it was, perhaps, a more successful strategy than Berger suggests.

Life-cycle saving refers to the propensity to save generated by the anticipated decline of income over the later part of the life course and a planned (or forced) retirement in late life. The goal was to accumulate assets to be used to maintain consumption in old age. In the nineteenth

---

<sup>1</sup> *Congressional Record*, Volume 47, Number 101, page 3913, reprinted in Berger [1929: 639].

<sup>2</sup> Berger was a founder of the Social Democratic Party of America and the first socialist elected to Congress [Gordon 1941]. His proposed remedy was a federal pension system for everyone over the age of sixty who were citizens for at least 16 years and not convicted felons to be paid from current tax revenues. His bill failed to pass [Miller 1973: 82-83]. Of course, twenty-four years later his vision became federal law with the passage of the Social Security Act. Berger’s act would have set the retirement age at 61; the Social Security Act set the standard retirement age at 65.

century the motivation for life-cycle saving was not so much a planned retirement, but protection from the risks that Congressman Berger alluded to: declining wages after middle age; occupational mobility in the downward direction (deskilling); and increasingly long spells of involuntary unemployment due to age discrimination, ill health, or disability. Because these concerns were ubiquitous in the latter half of the nineteenth century and because familial and government support was inadequate, saving was common and saving rates were high.

At the aggregate level gross private saving was surprisingly high. By the end of the nineteenth century this measure exceeded 30 percent of gross national product. Figure 1 plots the time series and indicates that there was a steady rise of the saving rate from the mid-1830s to the 1890s.<sup>3</sup> I suggest that the underlying reason for this rise was the widening spread of life-cycle motives to save and invest. By increasing the rate of saving in society and increasing the demand for financial assets as a store of wealth (as opposed to investments in land and its improvements) these savings financed the rapid rise of off-farm manufacturing and industrial development.

This paper explores several remarkable data sets to determine how they might shed light on the extent and spread of life-cycle saving in the nineteenth century. My primary evidence on saving is drawn from a number of government surveys of working class families undertaken in the period dating from the mid-1880s to 1900. These surveys provide individual-level quantitative information on family structure, demographic characteristics, occupations, wages, income, expenditures, savings, and asset holdings. Several of the series also provide responses to retrospective questions concerning savings, incomes, and productivity.<sup>4</sup> A sample of this rich

---

<sup>3</sup> Gross private saving includes investment in housing and consumer durables. For the years before the Civil War, 1834-1859, saving also includes the increase in the value of slaves. The original underlying estimates were made by Robert Gallman [1966]. These were revised by Paul Rhode [2002: table 1] and Richard Sutch [“National Income and Product,” 2006: table Ca233-240]. The Rhode estimates are reproduced in Sutch [“National Income,” 2006: table Ca219-232]. For the years following the Civil War, 1869-1909, the underlying estimates were also made by Robert Gallman [1966]. These were revised by Paul Rhode [2002: tables 2 and 3] and reproduced in Sutch [“National Income,” 2006: table Ca192-207]. For more details see the documentation accompanying these tables and the discussion in Sutch [“Saving, Capital, and Wealth,” 2006: 291-293]. [Jeffrey Williams remarked many years ago that ...](#)

<sup>4</sup> A description of this data and of the Historical Labor Statistics Project which collected and coded the data is provided by Carter, Ransom, and Sutch [1991].

data set has been explored before in a study I conducted with Roger Ransom which reached the conclusion that industrial workers during this period did, indeed, engage in life-cycle saving [Ransom and Sutch 1995, also see Haines 1985: 60]. But many of the surveys remain to be investigated. The results reported in this paper then are not surprising findings (at least, not surprising to me), but the data I examine here has not been investigated before. In that sense, this paper provides new evidence. I supplement these survey sources with a study of the cross-section distribution of wealth by age from the U.S. Census returns of 1870.

This paper is devoted to an initial explorative view of the data, examining each of several surveys individually. Each survey has unique features, unique advantages, and unique shortcomings. A formal meta analysis employing multivariate statistical techniques would be the next logical step but that effort is not undertaken here. Since my project is ongoing, I welcome suggestions and critical review.

Quite apart from the quantitative results reported here and in previous papers, there are *a priori* reasons to think that many Americans would have been engaging in life-cycle planning, life-cycle consumption, and life-cycle saving in the late-nineteenth century. Roger Ransom and I have suggested that during the first two-thirds of the nineteenth century there occurred a gradual transition away from a pre-modern family-based set of institutions which featured patriarchy, dynastic inheritance, high fertility, and grown-children's responsibility for their aging parents to a new set of institutions based on individual responsibility, reduced fertility, life-cycle saving, and self-financed support in old age [Ransom and Sutch 1986].<sup>5</sup> This transition links two great trends evident in nineteenth-century American economic development, the continuous decline in fertility and the dramatic rise in the rate of saving. As young couples increasingly turned to saving in order to secure their old age, the demand for assets increased and the demand for children fell. In a sense, *society gradually* substituted bank accounts for babies, financial accumulations for large families, and self-reliance for community altruism and reciprocity.<sup>6</sup>

---

<sup>5</sup> For brief reviews of the argument see Sutch [1991 and 2006: 291-293].

<sup>6</sup> I stress the point that it is society making this substitution, since individual families typically could not easily switch between or mix the two strategies.

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

Figure 2 displays a time series on the total fertility of white women. These data suggest that in 1800 the average American woman who survived to the end of her reproductive life would have given birth to 7 children. Because some women never marry and others are infertile or develop secondary infertility, seven children per women is close to the biological maximum for a large, heterogeneous population such as that of the United States in 1800. From this high level, the series shows a continuous and rather steady decline for the next 120 years.<sup>7</sup>

There is also strong empirical support for the prevalence of life-cycle saving in the twentieth century [Modigliani 1988 and Hurd 1987, 1990, 2002], suggesting, perhaps, that late-nineteenth century life-cycle saving was also common.

### **The Life-Cycle Hypothesis**

It may be helpful at this point to step back and briefly review the logic of the life-cycle hypothesis. That will help focus attention on the patterns of saving and wealth that are thought to be indicators of life-cycle saving and to distinguish that motive from alternative ones. Figure 3 reproduces a diagram employed by Franco Modigliani to articulate the life-cycle hypothesis of saving.<sup>8</sup> The diagram, first published in his famous article in *Social Research* in 1966,

---

<sup>7</sup> A negative relationship between the trends in fertility and saving explained by the simultaneous and linked transitions to “modern” saving and fertility patterns resolves a puzzle otherwise posed by the historical record. In the formal life-cycle model the aggregate saving-income ratio depends positively upon the rate of population growth [Modigliani 1966]. A rapidly growing population would have a greater proportion of young savers relative to older dis-savers. Thus the life-cycle model, in the absence of other factors, predicts declining fertility should lead to a fall in saving. Alternative economic models which place a heavy reliance on a bequest motive for saving also predict a positive relationship between fertility and saving. The more children, the greater would be the self denial required of parents who were saving to establish each child with a bequest of a given size [Easterlin 1976].

<sup>8</sup> The life-cycle model was introduced by Modigliani and Richard Brumberg in 1954.

represents a stylized temporal profile of income and consumption for an individual who enters the labor force at time zero and lives for  $L$  years. The diagram illustrates a case with labor income constant at  $\bar{Y}$  for  $N$  years and zero thereafter. Consumption is also assumed to be constant over the individual's entire life. This simplified version of the life-cycle hypothesis assumes that the individual will choose to exhaust his or her total life-time income through consumption. To accomplish this goal the constant level of consumption must be  $(N\bar{Y})/L$  and the rate of saving while working will be equal to  $1-(N/L)$ . The savings are invested in asset holdings,  $A(t)$ , which rise from zero at the outset to a peak magnitude at year  $N$  just sufficient to finance consumption for the final  $L-N$  years of life when the worker is assumed to be without employment either because of voluntary retirement or involuntary unemployment or disability. In retirement the assets are "dissaved" and eventually drawn down to zero at the predetermined time of death. The individual's wealth profile would exhibit a triangular or "humped" shape. Modigliani labeled this diagram with its humped shaped asset profile the "trademark" of the Life-Cycle Hypothesis [Modigliani 2001: 300].<sup>9</sup>

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

---

<sup>9</sup> If I might brag a bit, I was Franco's graduate student and research assistant at the time he prepared the *Social Research* paper for publication. I drafted the diagram that is here reproduced as Figure 1. It was also reproduced in Modigliani's Nobel Prize lecture [1986]. For a brief assessment of Modigliani's contributions to economics see Sutch [2009].

[Hurd 2002]. Thus the life-cycle hypothesis is consistent with the observation that many people die with a substantial positive estate.<sup>10</sup>

Planned bequests can be made through *inter vivos* gifts (conceptually, therefore, a component of consumption) or by establishing a target for end-of-life wealth holding.<sup>11</sup> But if the individual chooses the later strategy, retaining ownership of those planned bequests would act as insurance against living longer than intended or encountering unexpected needs late in life. Viewing the intended terminal bequest this way makes the extra saving involved a consequence of a “precautionary motive.” Yet this or any other manifestation of precautionary saving – to hedge against spells of unemployment, ill health, or other “rainy day” contingencies – can be subsumed within a life-cycle plan [Dynan, Skinner, and Zeldes 2002; and Hubbard, Skinner, and Zeldes 1994]. Should an emergency reduce the individual’s wealth holdings in mid-life, then saving will necessarily be extra intense afterwards to restore the equilibrium required between wealth and lifetime income on the date of leaving employment. A planned retirement might also be postponed if necessary to undo the damage caused by a financial emergency.

The model represented in Figure 3 considers an individual who earns an income through labor and who contrives on net to save nothing over his life. The dissaving at the end of life exactly cancels the saving during the working years. Assets, from the perspective of this worker, are an inventory of purchasing power that enables him or her to maintain a fairly stable rate of consumption in the face of variations in income, the most significant of which is the disappearance of income upon leaving employment. The fact that assets often generate income doesn’t really change the picture. If the worker invests the savings in fixed income securities (interest bearing accounts, bonds), in equities, or in real estate, the asset income will contribute to the value of the portfolio and reduce the amount of saving from labor income that would be required to achieve the asset target that permits exiting employment. Thus unexpectedly high

---

<sup>10</sup> Since these estates are passed on to the younger generation, many individuals will inherit some wealth in midlife. That windfall should reduce their rate of saving from labor income or hasten the day of their retirement.

<sup>11</sup> End-of-life bequests might be motivated by altruistic, charitable, or strategic motives. A strategic aim might be to manipulate the behavior of one’s heirs by holding their potential inheritance hostage to their behavior [Bernheim, Shleifer, and Summers 1985].

returns (e.g., high real interest rates) will tend to reduce the savings rate. This effect might be offset by the incentive that temporarily high rates of return would generate to saving more. Modigliani thought that the two effects would roughly cancel and that saving would be largely independent of the rate of interest [1986: 304].

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 articles reported cross-sectional studies employing post-war twentieth century data (largely from the late 1960s and the 1970s) that 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, Van Der Gaag, Smolensky, and Taussig 1982/83: 224; and Attanasio 1994: 121]. A number of more recent studies, however, have shown this observation to be wrong. Bequeathable wealth, in fact, declines with age in cross-section [Hurd 1990: 610-614]. “Bequeathable wealth” excludes annuity wealth such as the present value of future Social Security benefits. Since annuity wealth *by definition* declines with age during the years that benefits are paid, the sum of bequeathable and annuity wealth must also decline in the cross-section. Michael Hurd suggests that the earlier studies apparently did not have enough age detail to show that wealth eventually falls.<sup>12</sup>

Negative reports on the life-cycle hypothesis when tested in other countries (e.g. Canada, Japan, Italy, and the United Kingdom) led James Poterba to summarize this research by stating “country studies provide very little evidence that supports the life-cycle model” [Poterba 1994: 7]. Franco Modigliani countered this conclusion by pointing out that these studies defined income and wealth too narrowly. All the income produced by labor should be included according to the life-cycle hypothesis. These studies used disposable income which excludes

---

<sup>12</sup> Mirer’s result is a consequence of a cohort correction; his raw wealth data declines with age [Miran 1979, Row 1 of Table 1, p. 438; and Hurd 1990: 611]. Despite the fact that Attanasio concluded on the basis of his study of 1980s data that there was “little evidence of asset decumulation by the elderly,” his raw data on mean and median real estate wealth (and mean real estate plus financial wealth) did decline with age [1994: 121 and Table 2.16, p. 82]. In a number of these studies the data did not separate those who were retired from those who continued to earn labor income.



payroll taxes (for Social Security in the U.S.) and employers' contributions to pension plans. As Modigliani would model it, Social Security's payroll taxes should be considered a form of "compulsory" saving that builds up "Social Security wealth." The benefits received in old age should then be seen as drawing down those assets.<sup>13</sup> When Social Security is included as a form of wealth, the empirical wealth profile has the hump shape predicted by the life-cycle hypothesis [Modigliani and Sterling 1983, Modigliani 1988, and (for Italy) Modigliani and Jappelli 1987].

Appropriately specified tests of the life-cycle model provided support for dissaving and declining wealth for the retired [Diamond and Hausman 1984, Hurd 1987, and (for Canada) King and Dicks-Mireaux 1982]. There are however two important qualifications. First, these studies revealed that a minority of those surveyed do not display the saving behavior or the wealth humps predicted by the life-cycle hypothesis [King and Dicks-Mireaux 1982: 249-251 and Diamond and Hausman 1984: 81-83]. This group appears to have a lower-level of educational attainment. Second, there is an even smaller minority, the very rich, who save far more than can be predicted by life-cycle behavior [Hurd and Mundaca 1989; Carroll 2002; Dynan, Skinner, and Zeldes 2004; and Fan 2006].

### **Measuring the Incidence of Life-Cycle Behavior**

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

---

<sup>13</sup> The simple version of the life-cycle hypothesis made no allowance for the Social Security pension system as an alternative to private saving. Modigliani explained that when he and Brumberg formulated the model in 1952-1953 compulsory saving was of "small importance" [Modigliani 2001: 78]. There were significant increases in Social Security benefits between 1968 and 1972 [Hurd 1990: 590].

The idea that life-cycle behavior was common at the end of the nineteenth century has been contested. Michael Darby, noting the high saving rate at the turn of the century, suggested that the incentive to save could not have been generated by a life-cycle motive because retirement was, he thought, not very common at the time. Moreover, the presumed increase in the incidence and average length of retirement between 1890 and 1930 should, he argued, have increased life-cycle saving, but Darby could find no evidence of an upward trend in saving rates during this period. He concluded that this “appears to show that life-cycle motivations are a much less important source of aggregate saving than most persons have thought” [1979: 22-28, quotation on page 27].<sup>14</sup>

I believe that that Darby’s conclusion rests upon a misunderstanding of the historical record. The data that Darby relied upon for the level and trend in retirement rates is misleading. It referred to gainful occupation rates, not employment rates or labor force participation rates as currently understood.<sup>15</sup> The old Census Bureau concept of gainful occupation is not the same as employment and is different from the modern concept of labor force participation, which was first introduced in the late 1930s. As the U.S. Census Bureau noted:

The gainful worker concept differs radically from current labor force concepts ... [T]he term “gainful workers” includes all persons who usually followed a gainful occupation although they may not have been employed when the census was taken. ... The question as posed by the enumerator made no reference to time. The response thus varied substantially with the individual. Many persons who were retired or permanently disabled and who had not worked for some time reported their former line of work and were counted as gainful workers [U.S. Bureau of the Census 1975: 124].<sup>16</sup>

---

<sup>14</sup> Kotlikoff and Summers [1981] followed up on Darby’s argument and examined the trends in retirement practices, consumption patterns, and lifetime income profiles for the twentieth century back to 1900.

<sup>15</sup> Darby [1979: table 3.1] cites Clarence Long [1958: table A-2] as his source and Long uses the census data on gainful workers with only minor adjustments [1958: appendix F]. Long apparently felt that the gainful occupations data excluded the retired and disabled [p. 406].

<sup>16</sup> The inclusion of older nonemployed individuals was also acknowledged in the reports of the 1900 and 1940 censuses [U.S. Census 1900, Occupations, pp. ccxxv and ccxxxiii; and Durand and Goldfield 1944: 197-198]. Also see Carter and Sutch [1996] for a specific discussion of the census returns for 1870 and 1880 which are more problematic.

Thus many nonemployed individuals were reported as gainfully occupied simply because they had accumulated life-cycle savings.

Perhaps more important than this possible misclassification, the census records from 1880 and 1900 suggest that many older men who reported a gainful occupation experienced long spells of unemployment. Figure 4 presents the age profile of the unemployment rate for men based on the returns of the census in 1900.<sup>17</sup> {and 1880} The hazard of unemployment began to rise after men reached their mid-40s. It is evident that older men experienced a greater incidence of enforced idleness the older they were. Robert Margo has presented evidence from the 1900 census that long-term unemployment

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

Gainful occupation statistics do not provide a reliable guide to the trend of nonemployment for older men. Ransom and I reported that in 1900 one third of men 60 or over were either retired or had been without employment for six months or more in the preceding year and there was virtually no change in the employment rate of older men, aged 60 and over, between 1870 and 1930 [Ransom and Sutch, 1986: 6].<sup>18</sup>

---

<sup>17</sup> The data used to calculate the series plotted in the top panel of Figure 4 relies upon the 5-percent public-use sample of the enumerators' manuscripts from the 1900 census downloaded from the IPUMS-USA website, <http://usa.ipums.org/usa/index.shtml> [Ruggles et al 2010]. Both the 1900 and 1880 censuses report the number of months, out of the previous twelve, that a person who stated an occupation had been "unemployed." In 1900 the instructions to enumerators defined the unemployed as those "unable to secure work of any kind." The unemployment rate plotted was calculated by counting 1/12<sup>th</sup> of those who reported one month of unemployment in the previous year as unemployed (since the probability that such an individual would be unemployed in a given month would be one out of twelve), plus 1/6<sup>th</sup> of those who reported two months of unemployment, plus 1/4<sup>th</sup> who reported three months, and so on. This method of calculating unemployment from these census returns has been employed by Keyssar [1986: 357] and Margo [1988: 328]. The returns from the 1880 census show the same, though less pronounced, increased hazard of unemployment rates for older men than in 1900. The 1890 census results are not available. The manuscript returns were destroyed in a fire.

<sup>18</sup> This conclusion was further supported and defended in Ransom and Sutch [1989], Ransom, Sutch, and Williamson [1991], and Carter and Sutch [*Historical Methods*, 1996].

Not everyone has been convinced by this evidence. Actually, there is no indication that the skeptics were even aware of the evidence. Betsy Buttrill White (1978) and Laurence Kotlikoff and Lawrence Summers (1981) simulated life-cycle saving and accumulation and concluded that the model (with the parameter values they chose) did not generate sufficient saving to explain the observed levels of saving in the economy. Kotlikoff and Summers concluded their article with the statement that the “evidence presented in this paper rules out life-cycle hump saving as the major determinant of capital accumulation in the U.S. economy” [1981: 730].<sup>19</sup> In her history of retirement Dora Costa claims that “among men older than sixty-four, [labor force] participation rates fell steadily, from 78 percent in 1880 to 65 percent in 1900 [and to 58 percent in 1930]” [Costa 1998: 7]. Other skeptics include Jon Moen [1994], Chulhee Lee [1998 and 2002], and Joanna Short [2002]. Others have come away from the vigorous debate between Kotlikoff and Summers [1981 and Kotlikoff 1988] and Franco Modigliani [1988] unconvinced of the quantitative *unimportance* of a bequest motive [Bernheim 1991, Laitner and Juster 1996, Masson and Pestieau 1997, and Kopczuk and Lupton 2007].<sup>20</sup> The data that I review in this paper may help advance understanding.

---

<sup>19</sup> In my view the Kotlikoff-Summers calculations are seriously flawed. Their simulation of life-cycle wealth relied upon work experience rates by age for the early decades of the twentieth century that are pegged to the same unreliable gainful occupation rates that Darby used. The importance of retirement estimates to Kotlikoff and Summers’ findings is obscured because they are built into the age-earnings profiles of the *population* that are in turn the product of age-earnings profiles of *workers* and the age profiles of work experience [Kotlikoff and Summers 1981: 716-721]. Key ingredients of the Kotlikoff-Summers simulation are the age-earnings profiles of workers. Rather surprisingly, they simply imposed a constant shape. “For the years prior to 1950 the ... age-earnings profiles for the year 1955 were used” [p. 719]. Yet, as is well known, the age-earnings profiles of the post World War II era generally rise monotonically with age. It is generally supposed that this fact reflects the workings of an “internal labor market” which because of seniority systems, internal job hierarchies, and the use of so-called “efficiency wages” pay older workers more than their current marginal product while younger workers are underpaid [Lazear 1979 and 1981, Jacoby 1985, and Akerlof and Yellen 1986]. What is perhaps less well known, but nevertheless, well documented, is that the internal labor market and efficiency wages arose in the interwar period [Jacoby 1984 and Ransom, Sutch, and Williamson 1993]. It is inappropriate to impose the shape of earnings profiles from the mid-1950s onto workers from the period before World War I, or for that matter before World War II. The same difficulty plagues White’s simulations. She assumed age-income profiles that were either flat or rose with age [White 1978]. Also see Evans [1984] and White [1984].

<sup>20</sup> Some theorists simply assume the presence of strong bequest motives. For example, Gary Becker’s “rotten-kid theorem” assumes that altruistic parents should delay gifts of money to their children until after they die to prevent anti-sibling behavior by the selfish “rotten kid.” Assuming that parents plan to set the size of their bequest in accordance with each child’s needs, the rotten kid will have an incentive not to harm his siblings, because higher earnings by the those siblings will mean that more of the parents’ money will be given to the rotten sibling [Becker 1974; for an extended discussion see Bergstrom 2008].

## The HLSP Surveys of Income and Age

This paper examines several cross-section sources of data on age and household income and saving including some retrospective data on both which allows an examination of how circumstances and behavior changed for individual workers over time. These data sets are selected from a larger number under investigation in this project. See Table 1 for a listing. The results presented here are based upon budget surveys taken at various dates between 1884 and 1899 in Kansas, Michigan, and Wisconsin by those state's Bureaus of Labor. Each of these was a newly settled state just beginning the development of a manufacturing industry. If aggregate fertility rates are a reliable guide, the populations of these states were less advanced in adopting the life-cycle strategy than the workers from the industrial states of the east coast.

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

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

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

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

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

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

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

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

The survey covered 230 distinct occupations. Table 2 lists separately the 14 most commonly-stated occupations. In all but two (painter and molder) median annual earnings for men 60 and older were less than the earnings for men 45-59. The median earnings for all men 60 and older in the agricultural implements and iron industries was \$480 while that for men aged 45-59 was \$30 higher, \$510. Figure 5 plots the median annual earnings by age for the cross section of all 8,837 workers. The size of each bubble plotted reflects the relative number of respondents at each age. In the figure a polynomial has been used to smooth the data. `{lowess}` The polynomial reaches its maximum level of earnings at age 33 and slowly declines as the age increases further. Although this cross-section would not likely reflect the time path of earnings of a typical worker as he aged, it is not preposterous to claim that a young man in Michigan in 1890 starting out in this industry could observe in some rough way this cross section and conclude that it would be prudent to anticipate stable income after age 35 and declining income after age 65. A second survey from Michigan taken in 1895 reveals the same pattern of rising then declining median incomes as the survey of agricultural implement and iron workers. This

covered 1,200 street railway employees [Michigan 1895 and Carter, Ransom, Sutch, and Zhao, MI13C, 1993]. Figure 6 presents the age profile of median earnings.

Four years later the Kansas Bureau of Labor and Industry published in its *Fifteenth Annual Report* the largest, most comprehensive survey of workers conducted by that agency by that time [Kansas 1899 and Carter, Ransom, Sutch, and Zhao, KS15, 1993]. Though the Kansas Bureau had previously undertaken a number of worker surveys, this was the first since the passage of a law in 1898 reorganizing the Bureau and requiring that every "person, company or the proper officer of any corporation operating within the state" provide "full and complete answers . . . returned under oath" to interrogations made by the Commissioner. Failure to comply was considered a misdemeanor, punishable by fine and/or imprisonment [Kansas 1899: 2]. The Bureau was to preserve the confidentiality of respondents. The Bureau felt that the change in organization allowed it to develop a closer degree of cooperation with wage-earners, citing "an improvement in the general responses to the inquiries of the department," and a "personal interest manifested in the work of the Bureau by wage-earner generally throughout the state." It concluded, "This relation has enabled the Bureau to present what we believe to be the most comprehensive chapter on wage-earner statistics that has been presented in this state" [p. 1]. The Bureau felt that the reports were "representative of the various railway, mechanical and miscellaneous trades, as well as representative from a geographical point of view" [p. 4]. Figure 7 displays the age profile of the median annual earnings for 927 men. The decline in median income after age 37 is quite pronounced.

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

unemployment as they aged. (3: Downward Mobility) Perhaps as a consequence of 1 and 2, many workers changed to less demanding occupations in mid- to late-life, jobs which paid less.

### **Hard Work and Declining Productivity**

As industrial workers aged beyond a point in their 40s or 50s their productivity began to decline. This is not surprising since many turn-of-the-century jobs required heavy exertion, stamina, and strength and in some cases agility, dexterity, and/or visual acuity. Hard labor was exacerbated by long hours. The typical workweek in manufacturing was 66, rather than 40, hours. See Figure 8. In the industrial sector, machinery and the pace set by the machines meant that workers “must run with the machines,” as Edward Everett Hale pointed out in 1903.<sup>21</sup>

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

Social historians citing a wide variety of anecdotal evidence suggest that industrial workers in the latter half of the nineteenth century exhausted their “industrial life” well before death [Fischer 1978: chapter 4; Achenbaum 1978: chapters 3 and 6; Graebner 1980: chapter 2; and Gratton 1986: chapter 3].<sup>22</sup> Quantitative evidence of this “exhaustion” from the nineteenth century is scarce, but a unique investigation into the duration of the “trade life” of working men was conducted in New Jersey between 1888 and 1900 by that state’s Bureau of Statistics of Labor and Industries [New Jersey 1889, 1890, and 1891]. All together more than twelve thousand men over the age of 20 were surveyed in six industries. Each was asked “Have you begun to decline at your trade?” Using synthetic cohort techniques Ransom and I calculated that the typical age for the onset of decline would be in a man’s early 50s [1995: 312-316]. Since only men still working at their trade were included in the canvas this statistic excludes those in

---

<sup>21</sup> Hale was a well-known nineteenth-century Unitarian minister and author. He was 81 and the Chaplain of the U.S. Senate in 1903 [Adams 1977].

<sup>22</sup> The quotation is from Lee Welling Squier [1912: 272] who was cited by Graebner [1980: 20].



each cohort who had already left the trade at the time of the survey. And thus the age of the “climacteric” so estimated is biased upward.

Workers who felt they were in decline reported the cause. These are summarized in Table 3. In an era before environmental and workplace safety standards were in place, occupation-related illness and injury were common. The shaded cells indicate the leading cause of decline for each occupation. Note that mercury and lead poisoning were common among hatters and painters respectively. Mercury salts were used in finishing felt hats and the paints of the time contained lead. One painter commented to the New Jersey investigators: “It is rare to meet an old painter who has not the evidence of disease stamped on his face” [New Jersey 1891: 176]. Loss of strength or energy was a prominent response of miners and carpenters. Stiffening of the joints (lack of dexterity) was a frequent complaint of bricklayers, masons, glass workers, carpenters, and plumbers. One plumber reported:

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

Declining eyesight plagued printers. Plumbers reported high incidence of typhoid, a possible consequence of working with sewer pipes.<sup>23</sup> “In repairing, there are more or less bad odors from which the workmen are liable to get sick” [New Jersey 1891: 177].

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

One might expect the decline in health, energy, and productivity indicated by the New Jersey survey to have been reflected in the wage rate paid. This was an era in American

---

<sup>23</sup> See “Typhoid Fever Among Plumbers,” 1894.

industrial history before job hierarchies, long-term contracts, and employee benefits were common. Thus workers might be expected to be paid a wage roughly equal to their marginal productivity. To some extent the worker surveys indicate a falling off of wage rates as age increased in the cross sections of low-skilled occupations, but the effect is small and mostly likely is poorly measured given the small number of older men who worked at these occupations. High-skilled occupations do not exhibit a decline in average wage rate with age. See Table 4 for the averages for three occupations from Michigan's agricultural implements industry and iron works in 1890.

The explanation for this is that wage rates were often standardized. For example Table 5 illustrates the distribution of wage rates reported by unskilled laborers 21 and over in the Michigan implements and iron sample. The wage rates paid were typically in round numbers divisible by fifty cents. A majority of these men were paid \$7.50, \$8.00, or \$9.00 per week. The typical wage of molders and machinists was \$12, \$14, or \$15 per week. The downward trend of *annual earnings* with age despite the stability of *wage rates* is explained by two other phenomenon of the aging of the industrial work force: downward occupational mobility and increasing hazard of unemployment.

### **Downward Mobility**

Ransom and I reported evidence that many men moved down the occupational ladder from a skilled industrial job to a less-demanding, but less rewarding, occupation [Ransom and Sutch, *Journal of Economic History*, 1986: 19-24; and 1995: 308-309]. This deskilling reduced incomes even as wage rates in any given occupation did not change much with age. Figure 9 examines the responses of the Michigan street rail workers to the question "Have [your] wages increased or decreased in the past five years?" Plotted by age of the respondent, the proportion of responses indicating a decline rises sharply with age after about age 43. The proportion that reported an increase falls.<sup>24</sup> This report mirrors the responses to a similar question put to Michigan's stone and clay workers in 1888 and to that states' railroad employees in 1893 [Ransom and Sutch 1995: figures

---

<sup>24</sup> The survey was taken in 1895 and so workers were asked to look back to 1890. Nationally the wages of production workers in manufacturing fell slightly between 1890 and 1895 [Officer 2009: table 7.1].

11.4 and 11.5].<sup>25</sup> Older workers were more likely than younger workers to report declines in wages and less likely to report improvements in good times or bad.

There was a significant increase in the wages of manufacturing production workers between 1898 and 1899. According to Lawrence Officer's estimates there was a 2.4 percent increase in the average hourly compensation [Officer 2009: table 7.1]. In Kansas the worker survey taken in 1899 reflected this improvement. Only 10.5 percent of men reported earning a lower wage in that year as compared with the previous year, 44.3 percent reported an increase, and 45.3 percent reported no change. It is interesting, however to note that between the ages of 43 and 50 the proportion reporting that they enjoyed an increase declined with age. A comparison is made in Figure 10. Anticipating reduced incomes in late life many young and middle-aged workers would have a life-cycle motive to save even if they did not anticipate or intend to retire completely.

In the study conducted by the Michigan Bureau of Labor and Industrial Statistics in 1889 of the workers in Michigan's furniture industry respondents were asked the number of years each had been in his current occupation and how many years he had been with his current employer [Michigan 1889 and Carter, Ranson, Sutch, and Zhao, MI07, 1993].<sup>26</sup> Thirty-two percent of those between 40 and 67 reported that they had changed jobs within the last 18 months and 65 percent had changed employers at least once within the preceding five years. Thirty-two percent of the workers had changed occupations in the preceding five years suggesting that men had the opportunity to adjust the demands on their body by changing employers or occupations. Figure 11 plots the responses on the question about job changes by age. There even appears to be a rising tendency to report a recent job change among workers in their late fifties.

---

<sup>25</sup> The year 1888 saw national wages twelve-percent higher than they had been five years earlier while 1893 was generally depressed, wages were only 5.5 percent higher than in 1888 [Officer 2009: table 7.1].

<sup>26</sup> The canvass covered a total of 73 firms in 24 cities and surveyed 5,419 workers. The investigation, according to the *Report*,

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

## Unemployment

Congressman Berger suggested that workers faced “weeks, and sometimes months, of enforced idleness.” Figure 4 drawn from the IPUMS 5 percent sample of the 1900 census suggests that the unemployment rate of older men was higher than for men in their prime working years. Figure 12 paints a somewhat different picture based on the returns of the 1880 Census. However, the unemployment responses for 1880 were not compiled or published by the census. This fact, and doubts about their reliability expressed in the 1900 census volumes, suggest that unemployment rates were underestimated that year. Perhaps more reliable are the reports of the number of months of unemployment in the previous year reported by *those who did report unemployment*. I have tabulated this measure for both 1880 and 1900 and display the results in Figure 13. Both censuses suggest that older men experienced more months and longer spells of unemployment than their younger counterparts.

This picture of increasing unemployment with age is also evident in Figure 14 which displays the average number of days lost during the year “from inability to obtain work” for those included in the Kansas surveys of workers, 1885-1887, and the survey of Wisconsin workers in 1895.<sup>27</sup> We do not know if these reported spells of unemployment were due to temporary layoffs or due to extended job search when between employers. We have already seen that job changes were frequent, so the increased difficulty that older men faced in finding new employment may account for the patterns of months and days lost by age. Why employers facing the necessity of layoffs should discriminate against older workers is not clear. If standardized wage rates prevented case-by-case adjustment of wages as an older worker’s productivity began to decline, employers would have an incentive to lay off such older workers. Alternatively, employers may have favored younger men with families to support and discriminated against older workers who had grown children or acquired assets they could rely upon for support during downturns.

## Retirement

A third possibility that might explain the patterns in the average number of months lost to unemployment seen in the two tabulations based on the censuses is rising rates of retirement (more

---

<sup>27</sup> Similar results were reported for surveys of Michigan’s stone and clay workers in 1888, manufacturing workers in Maine in 1890, and Michigan farm laborers in 1894 [Ransom and Sutch 1995: figures 11.7 and 11.8].

properly, “nonemployment”) with age.<sup>28</sup> As mentioned, the censuses recorded the gainful occupation of workers defined as their “habitual occupation” regardless of whether they continued to work [Carter and Sutch 1996]. Those who had been retired for more than one year should have then recorded 12 months of unemployment. Figure 15 indicates that the number of men who reported no employment during the last year rises sharply after age 60. There can be no doubt that many men were without remunerative employment in old age even in the late nineteenth century. The employment rate for men sixty and older was reported by the census for 1870 and 1880 at 64.2 percent and 64.3 percent respectively [U.S. Census Office, 1870: volume III, p. 832; and 1880: 714]. Carter and Sutch offer a revised estimate for 1880 based on the IPUMS sample for that year of 68.3 percent [Carter and Sutch 1996: nnn]. The 1900 IPUMS sample suggests an employment rate of 67.7 percent. In 1930 the rate was 64.5 percent [Durand 1948: table A-2, p. 199]. Taken together these estimates suggest no major change in the rate of non-employment during the sixty years preceding the Great Depression and the enactment of Social Security.

The withdrawal of older men from industrial occupations is also suggested by the various worker samples we have been investigating. For example, the New Jersey survey of the trade life of journeymen reported very few men aged 60 or older were employed in the trades. Table 6 reports that less than one percent of workers in the six New Jersey industries were older than 59. The census of New Jersey, however, reported that over eleven percent of adult men were older than 59 [Carter et al 2006: table Aa4777-4877, pp. 298-299]. None of these industries were experiencing rapid growth in the period before the study, so the small number of workers 60 and over cannot be explained by a lack of employment history. Table 1 reports the percentage of men age 60 and over in each of the surveys examined. The average was only 2.6 percent of the men 25 and over. Yet the census of 1880 and 1900 reported that the proportions of men 25 and over who were 60 and older were 10.3 percent and 13.8 percent respectively. Clearly many men retired from these occupations.

---

<sup>28</sup> Retirement in the modern sense is an intentional and planned withdrawal from the labor force. The available statistics from the nineteenth century do not make it easy to infer which nonemployment was intentional and permanent and which was forced upon older workers by age discrimination and slack labor markets. For our purposes in studying the motivation for life-cycle saving it does not really matter as long as young men could foresee the day when they would experience long spells of nonemployment.

A recent paper by Lisa Dillon, Brian Gratton, and Jon Moen [2010] examines the Canadian Census of 1901 and sheds some light on the prevalence of retirement in that country which may be relevant for the U.S. case.<sup>29</sup> Canadian officials not only asked each worker for his or her gainful occupation but also included a separate question asking if they were retired. “Factoring in acknowledgment of retirement shifts the portrait of Canadian elderly men’s work activity considerably, especially among the very old” [Dillon, Gratton, and Moen 2010: 41]. The authors go on to conclude that “the data provide strong evidence that any series based on occupational report substantially exaggerates labour force participation” [p. 42]. According to their estimates 71 percent of men 60 and older were in the labor force in 1901. Assuming an unemployment rate of approximately 4 percent,<sup>30</sup> the employment rate for men 60 and older in Canada in 1901 would then be 68 percent, surprisingly close to the U.S. estimate for 1900 of 67.7 percent.

### **Strategy to Secure Old Age**

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

---

<sup>29</sup> There is some reason to suppose that the problems of nonemployment and the need for old age support was similar for manufacturing and industrial workers in Canada to the situation in the U.S. See the contributions by Livio De Matteo [1997, 1998].

<sup>30</sup> The U.S. unemployment in 1901 has been estimated to have been 4.14 percent [Weir 1992: table D-3, p. 341].

company or government pensions were available, the problem of old age security must have weighted heavily upon young families.<sup>31</sup>

Two quite different strategies presented themselves as alternatives [Ransom and Sutch 1989]. The traditional method of providing support of older members of the population was to rely upon transfers from younger household members [Leibenstein 1975]. An alternative strategy, which became feasible with the appearance of financial intermediaries in the mid-nineteenth century was to engage in life-cycle saving. For most workers the choice between the traditional and the modern approach had to be made early in their working life and the decision was irrevocable. Success with the traditional strategy depends upon producing a large family and, if nothing else, biology precludes indefinite postponement [Nugent 1985]. Moreover, once born, children could not be exchanged for financial assets should parents wish to switch strategies. Finally, the costs of rearing a large family would produce a strain on family income that would make subsequent saving difficult [Leff 1969, Oppenheimer 1982, and Lewis 1983].

The transition from a traditional strategy to the self-reliant life-cycle strategy was a gradual process and not yet complete by the end of the nineteenth century. A cross section of saving behavior observed during the process of this transition should reveal both types of saving behavior. A majority of American families should have been pursuing the modern strategy in which they attempt to accumulate an acquired “competence” – in the words of Congressman Berger.<sup>32</sup> On the other hand, there might remain a minority of workers who either by choice or circumstance saved very little. Presumably they would have to turn to other household members should old age, illness, or unemployment require financial support. It is noteworthy that many studies of saving behavior conducted with twentieth century data produced evidence for the presence of both strategies. The prevailing consensus seems to be, in the words of Mervyn King,

---

<sup>31</sup> Old age pensions for Union veterans of the Civil War were introduced in 1904 by the executive order of President Theodore Roosevelt and regularized by Congress in 1907 [Haber 1983: 112]. Before that date only veterans with a disability certified by three physicians was eligible for a pension [Eli 2010]. On the origins of company pensions after 1905 see Ransom, Sutch, and Williamson [1993].

<sup>32</sup> According to Henry Bedford the word “competence” was commonly used to denote a skill in a specific trade acquired through training or experience – “he is a competent carpenter” – but this broadened meaning to denote the ownership of liquid assets sufficient to finance retirement was introduced by Henry K. Oliver, the first Commissioner of the Massachusetts Bureau of Statistics and Labor [Bedford 1995: 76].

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

The Kansas surveys of 1885-1887 asked if the respondents had accumulated savings in past years. Over sixty percent replied in the affirmative. The top panel of Figure 16 plots the responses by age. The same survey asked if there were any saving in just the past year. These responses are plotted by age in the bottom panel of Figure 16. As expected, there is an evident tendency for saving behavior to decline at the older ages. Presumably incomes for the older men had begun to fall and the incidence of unemployment was rising, so saving was more difficult. In some cases dissaving from previously acquired assets might have been necessary to maintain consumption. A similar age profile of savers is evident in the responses to the Wisconsin study of 1895. In Figure 17 the single men are plotted with yellow bubbles and the men with families with green bubbles.

Savings rates were quite high. The top panel of Figure 18 indicates the fraction of total earnings saved by Kansas families who did save during the past year. The plots indicate that something like 25 to 35 percent saving rates were reported. The bottom panel of Figure 18 displays the saving rates for the Wisconsin workers. They reported savings rates in the neighborhood of 25 percent.

### **Asset Holdings**

If life-cycle saving was prevalent among industrial workers, then I would anticipate that the workers surveyed by the state bureaus would own substantial wealth by their 50s. None of worker surveys report total wealth, however several reported homeownership. A home is an excellent life-cycle asset. In old age rooms can be rented to provide a stream of income, or the home could be sold and the proceeds used to finance consumption, including the rent of smaller quarters. It may surprise some that the fraction reporting that they owned a home in Kansas and Wisconsin exceeded well over 50 percent by age 50. The age profile of home ownership for Kansas for 1885-1887 is displayed in top panel of Figure 19 and that for the 1899 survey in the bottom panel of the Figure. The data for Wisconsin in Figure 20 is even more impressive. The



workers surveyed were industrial workers living in urban settings, while many lived in tenements or rented rooms in another's home, many seemed able to acquire the capacity to purchase.

Another asset reported by the Kansas workers in 1885-1887 was a life insurance policy. In all likelihood these were tontine policies. This peculiarly nineteenth-century form of life insurance worked like a combination of term life insurance, which protected the family in the event of the premature death of the family breadwinner, and a pre-purchased annuity beginning when the life coverage ended. Ransom and I have described the popularity of the tontine policy elsewhere [Ransom and Sutch 1987]. We estimated the total volume of tontine insurance in force exceeded 7.5 percent of the total national wealth in 1905 [p. 385]. As a rough guess, we estimated there may have been as many as 9 million individual tontine policies for a population of 18 million households [p. 386]. The ownership of insurance among Kansas workers in 1885-1887 exceeded 50 percent of men in their 40s. Figure 21 displays the age profile. These significant rates of home ownership and insurance policies suggest that wealth holding was significant among working class families late in their work life.

While none of the worker survey considered here asked explicitly about wealth holdings, the U.S. Census of 1870 included two questions; one about the value of real estate ownership and a second about the value of "personal estate." These data are particularly interesting since the census required responses from everyone unlike the worker surveys which included only employed men. The humped-shaped wealth profiles that are the signature of the life-cycle model would be most evident, if they are present, in samples that include the nonemployed. These individuals would be the most likely to be dissaving and drawing down their wealth.<sup>33</sup>

### **Wealth Holding by Age in 1870**

One might be tempted to skip over the evidence on cross section age-wealth profiles. After all, the cross sections are a snapshot of the population at a point in time, a "synthetic cohort." These can be misleading if interpreted as the life-time profile of a typical individual. For example, strong economic growth over the decades before the census might mean that the older

---

<sup>33</sup> The wealth questions asked in 1870 were repeated from the census of 1860. The real estate question was also asked in 1850. I do not consider these pre-Civil War data in this paper in order to concentrate on the 1870 data.

individuals had lower incomes over their working life, and thus less wealth accumulation, than the middle-aged were currently experiencing. That effect might exaggerate the apparent decline of wealth in old age. Another difficulty we encountered employing the synthetic cohort approach with nineteenth century data is that it is difficult to reliably separate the retired from those still working since the census of 1870 recorded gainful occupation rather than employment and did not make inquiries about unemployment. Michael Hurd, discussing twentieth century data, claims the only reliable tests of the life-cycle hypothesis employ longitudinal data.

Despite these problems, I think it worthwhile to explore the census wealth data provided we remain attentive to the potential pitfalls. First, it is a remarkable data set, unmatched for coverage as far as I am aware by any twentieth century data. For the census of 1870 we have a one-percent sample of every adult. Lee Soltow, the dean of researchers in this field described the data as “precious,” too valuable to ignore. Moreover, although it is a weak test, a failure to find decumulation in late life would at least raise doubts about the suggestion that there was a transition away from dynastic saving and toward life-cycle saving in the first half of the nineteenth century.

Lee Soltow was the pioneer in using the Census data to study patterns of wealth holding. He devoted his career to collecting data on wealth and income inequality. In his major contribution, *Men and Wealth in the United States, 1850-1870* [1975], Soltow reported findings based on “spin samples” drawn from the microfilms of the census enumerations. He marked a spot on the screen of the microfilm, turned the crank a half turn and sampled the individual whose name fell on the marked spot provided it was a male 20 or older. He proceeded in this fashion through all of the microfilms for the 1870 census. The resulting sample size was nearly ten thousand [Soltow 1975: 4-5]. That sample sizes would be roughly xx percent of the total number of men 20 and older. In this work and in an earlier book devoted to Wisconsin, Soltow presented scatter diagrams and moving average charts that plotted wealth by age [for examples see Soltow 1971: Exhibit 5, p. 37; 1975: Chart 3.2, p. 78].<sup>34</sup> Despite the fact that his chart for

---

<sup>34</sup> Soltow’s work on wealth in the nineteenth century U.S. was foreshadowed by Robert Gallman [1969]. Gallman drew a more limited set of samples from the manuscript census returns than Soltow and did not report on wealthholding by age.

Wisconsin revealed a hump-shaped cross section of mean wealth and the U.S. data revealed “evidence the individual dissaves after he is in his forties” [1975: 73], Soltow fit linear [1975: 80] or exponential relationships [1971: 36] rather than a polynomial to summarize the wealth by age data.

Although Soltow’s extraordinary efforts at data collection are impressive, he had little influence on the study of life-cycle saving in the ninetieth century. Partly this is due to the fact that the two books are dense, obscure, and difficult to read. As William Parker put it, supposedly quoting Huck Finn’s appraisal of the Bible, Soltow is “good readin’ but tough” [Parker 1974,1975].<sup>35</sup> Soltow did not refer to the life-cycle hypothesis nor did he cite Modigliani. He did not discuss the likelihood or prevalence of retirement other than to note, almost as an aside, that “wealth is the goal because it is needed to provide retirement income” [1975: 90].<sup>36</sup>

To focus the analysis I concentrate on the responses of men who were designated by the IPUMS protocol as “heads of households.” I include only white men, since the newly-freed blacks are unlikely to have found themselves in wealth-income equilibrium by 1870 [Ransom and Sutch 1988]. Only 26.7 percent of black households with a head aged 16 or older reported owning wealth. By contrast, 77.5 percent of whites responded to the inquiries about their property ownership. Figure 22 presents the age distribution of those who reported no wealth. More than eighty percent of those over 30 reported some wealth. Yet, it is not likely that all those who reported zero wealth were actually without estate [Lebergott 1976: 797]. The treatment of the zero wealth holders is problematic. Excluding them from the analysis, as I shall do, implicitly argues that many of the zero wealth holders were part of the presumed minority who did not engage in life-cycle savings and instead relied upon the traditional strategy of reliance upon grown children. At the same time, this approach will underestimate the median

---

<sup>35</sup> The quip is classic Bill Parker (so good, he used it twice), but it’s not exactly Mark Twain. In chapter 17 of *Huckleberry Finn* the protagonist relates the following: “There was some books, too, piled up perfectly exact, on each corner of the table. One was a big family Bible full of pictures. One was Pilgrim’s Progress, about a man that left his family, it didn’t say why. I read considerable in it now and then. The statements was interesting, but tough” [Twain 1885].

<sup>36</sup> Despite a public plea by a distinguished colleague that he share his data [Lebergott 1976: 796-797], Soltow never did so and even refused to provide his data to a “very prominent economic historian ... on the grounds that the scholar would misuse it” [Vedder 2005: np].

wealth profiles by age to the extent that some households with wealth either did not report to the census or reported their wealth in the name of someone other than the head of household. If I were to include those who reported no wealth in the wealth distribution, I would be in danger of exaggerating the fall in wealth at older ages as is evident by the rise in the proportion of zero wealth holders at the oldest ages. To bias the results against the proposed conclusion, I exclude the zero wealth holders from the analysis.

Figure 23 presents the percentiles of the wealth distribution as an age profile for ages up to 85. The median and the 75<sup>th</sup> percentile clearly show declining wealth after the mid to late 60s. The Modigliani hump-shape is affirmed. The decline in wealth at older ages for the 25<sup>th</sup> percentile is very slight. But this is what we might expect; those with low levels of wealth are more likely to be traditionalists relying primarily on grown children for support.

## **Conclusions**

The evidence presented here provides strong circumstantial evidence that many industrial workers engaged in life-cycle saving. Their savings rates were high. The motivation seems to be the decline in total income evident with age in the cross section, the longer and more common spells of unemployment, and the decline in productivity in physically demanding occupations.



## Bibliography

- Achenbaum, W. Andrew (1978). *Old Age in the New Land: The American Experience since 1790*, Johns Hopkins University Press, 1978.
- Adams, John R. (1977). *Edward Everett Hale*, Twayne Publishers, 1977.
- Akerlof, George A., and Janet L. Yellen, editors (1986). *Efficiency Wage Models of the Labor Market*. Cambridge University Press, 1986.
- Atack, Jeremy, and Fred Bateman (1987). *To Their Own Soil: Agriculture in the Antebellum North*, Iowa State University Press, 1987.
- Attanasio, Orazio P. (1994). "Personal Saving in the United States," Chapter 2 in James M. Poterba, editor, *International Comparisons of Household Saving*, University of Chicago Press, 1994: 57-123.
- Berger, Victor L. (1929). *Voice and Pen of Victor L. Berger: Congressional Speeches and Editorials*, Milwaukee Leader, 1929.
- Bernheim, B. Douglas (1991). "How Strong Are Bequest Motives? Evidence Based on Estimates of the Demand for Life Insurance and Annuities," *Journal of Political Economy* 99 (5) October 1991: 899-927.
- Bernheim, B. Douglas, Andrei Shleifer, and Lawrence H. Summers (1985). "The Strategic Bequest Motive," *Journal of Political Economy* 93(6) December 1985: 1045-1076.
- Carroll, Christopher D. (2000). "Why Do the Rich Save So Much?" In Joel B. Slemrod, editor, *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*, Harvard University Press, 2000.
- Carroll, Christopher D. (2002). "Portfolios of the Rich" Chapter 10 in Luigi Guiso, Michael Haliassos, and Tullio Jappelli, editors, *Household Portfolios*, MIT Press, 2002: 389-429.
- Carter, Susan B. (2010). "The Shift Out of Agriculture and Modern Economic Growth: The U.S. Case," Paper prepared for the International Network for the Comparative History of Occupational Structure (INCHOS), University of Cambridge, Draft of February 17, 2011, forthcoming.
- Carter, Susan B., and Richard Sutch (1992). "The Depression of the 1890s: New Suggestive Estimates of the Unemployment Rate, 1890-1905," *Research in Economic History* 14, 1992: 347-376. .
- Carter, Susan B., and Richard Sutch (1996). "Fixing the Facts: Editing of the 1880 U.S. Census of Occupations with Implications for Long-Term Labor-Force Trends and the Sociology of Official Statistics," *Historical Methods* 29 (1) Winter 1996: 5-24.
- Carter, Susan B., and Richard Sutch (1996). "Myth of the Industrial Scrap Heap: A Revisionist View of Turn-of-the-Century American Retirement," *Journal of Economic History* 56 (1) March 1996: 5-38.
- Carter, Susan B.; Roger L. Ransom; and Richard Sutch (1991), "The Historical Labor Statistics Project at the University of California," *Historical Methods* 24 (2) Spring 1991: 52-65.
- Carter, Susan B.; Roger L. Ransom; and Richard Sutch (2004). "Family Matters: The Life-Cycle Transition and the Antebellum American Fertility Decline," Chapter 11 in Timothy W. Guinnane, William A. Sundstrom, and Warren Whatley, editors, *History Matters: Essays on Economic Growth, Technology, and Demographic Change*, Stanford University Press, 2004: 271-327.

- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,165 Workers in Kansas, 1884-1887; Reported in the First, Second, and Third Annual Reports of the Kansas Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook KS1-3*, Institute of Business and Economic Research, University of California, Berkeley, January 18, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 514 Male Wage-Earners in Kansas, 1895; Reported in the Eleventh Annual Report of the Kansas Bureau of Labor and Industry, Historical Labor Statistics Project Codebook KS11*, Institute of Business and Economic Research, University of California, Berkeley, May 6, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 539 Wage-Earners in Kansas, 1896; Reported in the Eleventh Annual Report of the Kansas Bureau of Labor and Industry, Historical Labor Statistics Project Codebook KS12*, Institute of Business and Economic Research, University of California, Berkeley, May 7, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,204 Wage-Earners in Kansas, 1897; Reported in the Thirteenth Annual Report of the Kansas Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook KS13*, Institute of Business and Economic Research, University of California, Berkeley, May 8, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,058 Wage-Earners in Kansas, 1899; Reported in the Fifteenth Annual Report of the Kansas Bureau of Labor and Industry, Historical Labor Statistics Project Codebook KS15*, Institute of Business and Economic Research, University of California, Berkeley, May 10, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 3,920 Male Workers in the Agricultural Implement and Iron Industries in Detroit, 1890; Reported in the Eighth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI08A*, Institute of Business and Economic Research, University of California, Berkeley, June 1, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 4,918 Male Workers in the Agricultural Implement and Iron Industries in Michigan Outside of Detroit, 1890; Reported in the Eighth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI08B*, Institute of Business and Economic Research, University of California, Berkeley, June 2, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,200 Employees of Street Railways in Michigan, 1895; Reported in the Thirteenth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI13C*, Institute of Business and Economic Research, University of California, Berkeley, July 5, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,490 Mechanics' and Workingmen's Returns in Wisconsin, 1895; Reported in the Seventh Biennial Report of the Wisconsin Bureau of Labor, Census, and Industrial Statistics, Historical Labor Statistics Project Codebook WI07B*, Institute of Business and Economic Research, University of California, Berkeley, July 14, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,084 Workers in Maine, 1890; Reported in the Fifth Annual Report of the Maine Bureau of Industrial and Labor Statistics, Historical Labor Statistics Project Codebook ME05*, Institute of Business and Economic Research, University of California, Berkeley, May 22, 1993.

- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 259 Wage-Workers in Missouri, 1891; Reported in the Fourteenth Annual Report of the Missouri Bureau of Labor Statistics and Inspection, Historical Labor Statistics Project Codebook MO14*, Institute of Business and Economic Research, University of California, Berkeley, July 7, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 6,051 Male Railway Employees in Michigan, 1893; Reported in the Eleventh Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI11*, Institute of Business and Economic Research, University of California, Berkeley, June 13, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 5,419 Workers in the Furniture Industry of Michigan, 1889; Reported in the Seventh Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI07*, Institute of Business and Economic Research, University of California, Berkeley, June 3, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 719 Stone Workers in Michigan, 1888; Reported in the Sixth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI06*, Institute of Business and Economic Research, University of California, Berkeley, May 25, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 5,600 Farm Laborers in Michigan, 1894; Reported in the Twelfth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI12B*, Institute of Business and Economic Research, University of California, Berkeley, June 29, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,950 Employees of Hack and Bus Lines in Michigan, 1895; Reported in the Thirteenth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI13A*, Institute of Business and Economic Research, University of California, Berkeley, July 3, 1993.
- Carter, Susan B.; Roger L. Ransom; Richard Sutch; and Hongcheng Zhao (1993). *Codebook and User's Manual: A Survey of 1,250 Owners of Hacks, Drays, Buses, Etc. Who Drive their Own Teams in Michigan, 1895; Reported in the Thirteenth Annual Report of the Michigan Bureau of Labor and Industrial Statistics, Historical Labor Statistics Project Codebook MI13B*, Institute of Business and Economic Research, University of California, Berkeley, July 5, 1993.
- Carter, Susan B.; Scott Sigmund Gartner; Michael R. Haines; Alan L. Olmstead; Richard Sutch; and Gavin Wright, editors (2006). *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, five volumes, Cambridge University Press, 2006.
- Coale, Ansley J., and Melvin Zelnik (1963). *New Estimates of Fertility and Population in the United States: A Study of Annual White Births from 1855 to 1960 and of Completeness of Enumeration in the Censuses from 1880 to 1960*, Princeton University Press, 1963.
- Costa, Dora L. (1998). *The Evolution of Retirement: An American Economic History, 1880-1990*, University of Chicago Press, 1998.
- Danziger, Sheldon; Jacques van der Gaag; Eugene Smolensky; and Michael Taussig (1982). "The Life Cycle Hypothesis and the Consumption Behavior of the Elderly," *Journal of Post Keynesian Economics* 5 (2) Winter 1982-1983: 208-227.
- Darby, Michael R. (1979). *The Effects of Social Security on Income and the Capital Stock*, American Enterprise Institute for Public Policy Research, 1979.



- Di Matteo, Livio (1997). "The Determinants of Wealth and Asset Holding in Nineteenth Century Canada: Evidence from Micro-data," *Journal of Economic History* 57 (4) December 1997: 907-934.
- Di Matteo, Livio (1998). "Wealth Accumulation and the Life-Cycle in Economic History: Implications of Alternative Approaches to Data," *Explorations in Economic History* 35 (3) July 1998: 296-324.
- Diamond, P[eter] A., and J[ames] A. Hausman (1984). "Individual Retirement and Savings Behavior," *Journal of Public Economics* 1984 23 (1-2) February-March 1984: 81-114.
- Dillon, Lisa (2008). *The Shady Side of Fifty: Aged and Old Age in Late Victorian Canada and the United States*, McGill-Queen's University Press, 2008.
- Dillon, Lisa; Brian Gratton; Jon Moen (2010). "Retirement at the Turn of the Twentieth Century: A Canadian Perspective," *Canadian Historical Review* 91 (1) March 2010: 27-59.
- Durand, John D. (1948). *The Labor Force in the United States, 1890-1960*. Social Science Research Council, 1948.
- Durand, John D., and Edwin Goldfield (1944). U.S. Bureau of the Census, Sixteenth Census, 1940. Population: Estimates of the Labor Force, Employment, and Unemployment in the United States, 1940 and 1930, U.S. Government Printing Office, 1944.
- Dynan, Karen E., Johnathan Skinner, and Stephen P. Zeldes (2002). "The Importance of Bequests and Life-Cycle Saving in Capital Accumulation: A New Answer," *American Economic Review* 92 (2) May 2002: 274-278.
- Dynan, Karen E., Johnathan Skinner, and Stephen P. Zeldes (2004). "Do the Rich Save More?" *Journal of Political Economy* 112 (2) April 2004: 397-444.
- Easterlin, Richard A. (1976). "Population Change and Farm Settlement in the Northern United States," *Journal of Economic History* 36 (1) March 1976: 45-83.
- Eli, Shari (2010). "Wealth is Health: Pensions and Disease Onset in the Gilded Age," unpublished paper, Department of Economics, University of California, Berkeley, September 27, 2010.
- Evans, Owen J. (1984). "Empirical Tests of the Life Cycle Hypothesis: Comment," *American Economic Review* 74 (1) March 1984: 254-257.
- Fan, C. Simon (2006). "Do the Rich Save More? A New View Based on Intergenerational Transfers," *Southern Economic Journal* 73 (2) October 2006: 362-373.
- Filer, Randall, and Peter A. Petri (1988). "A Job-Characteristics Theory of Retirement," *Review of Economics and Statistics* 70 (1) February 1988: 123-128.
- Fischer, David Hackett (1978). *Growing Old in America*, expanded edition, Oxford University Press, 1978.
- Gallman, Robert E. (1966). "Gross National Product in the United States, 1834-1909." In Dorothy S. Brady, editor, *Output, Employment, and Productivity in the United States after 1800*, National Bureau of Economic Research, Conference in Research on Income and Wealth, Studies in Income and Wealth, volume 30, Columbia University Press, 1966: 3-90.
- Gallman, Robert E. (1969). "Trends in the Size Distribution of Wealth in the Nineteenth Century: Some Speculations," Chapter 1 in Lee Soltow, editor, *Six Papers on the Size Distribution of Wealth and Income*, National Bureau of Economic Research, 1969: 1-30.

- Gallman, Robert E. (1975). "The Agricultural Sector and the Pace of Economic Growth: U.S. Experience in the Nineteenth Century," Chapter 2 in David C. Klingaman and Richard K. Vedder, editors, *Essays in Nineteenth Century Economic History: The Old Northwest*, Ohio University Press: 35-76.
- Gordon, Max (1941). "Victor Berger, Socialist Persuader in Congress," Dissertation (Master of Arts), University of Wisconsin, Madison, 1941.
- Graebner, William (1980). *A History of Retirement: The Meaning and Function of An American Institution, 1885-1978*, Yale University Press, 1980.
- Gratton, Brian (1986). *Urban Elders: Family, Work, and Welfare among Boston's Aged, 1890-1950*, Temple University Press, 1986.
- Gratton, Brian, and Frances M. Rotondo (1991). "Industrialization, the Family Economy, and the Economic Status of the American Elderly," *Social Science History* 15 (3) Autumn 1991: 337-362.
- Haber, Carole (1983). *Beyond Sixty-Five: The Dilemma of Old Age in America's Past*, Cambridge University Press, 1983.
- Haber, Carole, and Brian Gratton (1994). *Old Age and the Search for Security: An American Social History*, Indiana University Press, 1994.
- Haines, Michael R. (1979). "Industrial Work and the Family Life-Cycle, 1889-1890," *Research in Economic History* 4, 1979: 289-356.
- Haines, Michael R. (1985). "Life Cycle Savings and Demographic Adaptation: Some Historical Evidence for the United States and Europe," in Alice S. Rossi, editor, *Gender and the Life Course*, Aldine, 1985: 45-63.
- Haines, Michael R., and Allen C. Goodman (1992). "Housing Demand in the United States in the Late Nineteenth Century: Evidence from the Commissioner of Labor Survey, 1889/1890," *Journal of Urban Economics* 31 (1) January 1992: 99-122.
- Hale, Edward Everett (1903). "Old Age Pensions," *Cosmopolitan* 35, June 1903: 168-172.
- Holden, Karen C. (1988). "Physically Demanding Occupations, Health, and Work After Retirement: Findings From the New Beneficiary Survey," *Social Security Bulletin* 51 (11), September 1988.
- Hubbard, R. Glen, Jonathan S. Skinner, and Stephen P. Zeldes (1994). "The Importance of Precautionary Motives in Explaining Individual and Aggregate Saving," *Carnegie-Rochester Conference Series on Public Policy* 40, 1994: 59-125.
- Hurd, Michael D. (1987). "Savings of the Elderly and Desired Bequests," *American Economic Review* 77 (3) June 1987: 298-312.
- Hurd, Michael D. (1989). "Mortality Risk and Bequests," *Econometrica* 57(4) July 1989: 779-813.
- Hurd, Michael D. (1997). "The Economics of Individual Aging," Chapter 16 in Mark R. Rosenzweig and Oded Stark, editors, *Handbook of Population and Family Economics*, Volume 1B, Elsevier, 1997: 891-966.
- Hurd, Michael D. (2002). "Are Bequests Accidental or Desired?" *RAND Working Paper Series* Number 03-13, Labor and Population Program, RAND Corporation, January 2002.

- Hurd, Michael D., and B. Gabriela Mundaca (1989). "The Importance of Gifts and Inheritances Among the Affluent," Chapter 14 in Robert E. Lipsey and Helen Stone Tice, editors, *The Measurement of Saving, Investment, and Wealth*, University of Chicago Press, 1989: 737-764.
- Jacoby, Sanford M. (1984). "The Development of Internal Labor Markets in American Manufacturing Firms," Paul Osterman, editor, *Internal Labor Markets*, MIT Press 1984: 23-69.
- Jacoby, Sanford M. (1985). *Employing Bureaucracy: Managers, Unions, and the Transformation of Work in American Industry, 1900-1945*, Columbia University Press, 1985.
- James, John A., and Jonathan Skinner (1987). "Sources of Savings in the Nineteenth-Century United States," Chapter 8 in Peter Kilby, editor, *Quantity and Quiddity: Essays in U.S. Economic History in Honor of Stanley Lebergott*, Wesleyan University Press, 1987: 255-285.
- James, John A., Michael Palumbo, and Mark Thomas (1999). "Saving for Retirement before Social Security," *National Tax Journal Papers and Proceedings*, 1999: 361-380.
- James, John A., Michael Palumbo, and Mark Thomas (2005). "Have American Workers Always Been Low Savers?" Patterns of Accumulation among Working-Class Households, 1885-1910," *Research in Economic History* 23, Amsterdam: Elsevier, 2005: 127-175.
- Jones, Ethel B. (1963). "New Estimates of Hours of Work per Week and Hourly Earnings, 1900-1957," *Review of Economics and Statistics* 45 (4) 1963: 375-385.
- Kansas, Bureau of Labor and Industrial Statistics (1886). *First Annual Report, January 1, 1886*, Topeka, T.D. Thacher, State Printer, 1886: 10-11.
- Kansas, Bureau of Labor and Industrial Statistics (1887). *Second Annual Report, January 1, 1887*, Topeka, T.D. Thatcher, State Printer, 1887: 307-351.
- Kansas, Bureau of Labor and Industrial Statistics (1888). *Third Annual Report, January 1, 1888*, Topeka: Clifford C. Baker, State Printer, 1888:134-156.
- Kansas, Bureau of Labor and Industrial Statistics (1898). *Thirteenth Annual Report, 1897*, Topeka, J. S. Parks, State Printer, 1898.
- Kansas, Bureau of Labor and Industry (1895). *Eleventh Annual Report, 1895*, Topeka, Kansas State Printing Company: J. K. Hudson, State Printer, 1896.
- Kansas, Bureau of Labor and Industry (1896). *Twelfth Annual Report, 1896*, Topeka, Kansas State Printing Company: J. K. Hudson, State Printer, 1897.
- Kansas, Bureau of Labor and Industry (1899). *Fifteenth Annual Report 1899*, Topeka: W. Y. Morgan, State Printer, 1900.
- Kearl, J. R., and Clayne L. Pope (1983). "The Life-Cycle in Economic History," *Journal of Economic History* 43 (1) March 1983: 149-158.
- Kessler, Denis, and André Masson (1989). "Bequest and Wealth Accumulation: Are Some Pieces of the Puzzle Missing?" *Journal of Economic Perspectives* 3 (3) Summer 1989: 141-152.

- Keyssar, Alexander (1986). *Out of Work: The First Century of Unemployment in Massachusetts*, Cambridge University Press, 1986.
- King, M[ervyn] A., and Dicks-Mireaux, L[ouis]-D. L. (1982). "Asset Holdings and the Life-Cycle," *Economic Journal* 92 (366) June 1982: 247-267.
- King, Mervyn A. (1983). "The Economics of Saving," *NBER Working Paper Series*, Number 1247, National Bureau of Economic Research, December 1983.
- King, Mervyn A. (1985). "The Economics of Saving: A Survey of Recent Contributions," Kenneth J. Arrow and Seppo Kopkapohja, editors, *Frontiers in Economics*, Basil Blackwell 1985.
- Kopczuk, Wojciech., and Joseph P. Lupton (2007). "To Leave or Not to Leave: An Empirical Investigation of the Distribution of Bequest Motives," *Review of Economic Studies* 74 (1) January 2007: 207-235.
- Kotlikoff, Laurence J. (1988). "Intergenerational Transfers and Savings," *Journal of Economic Perspectives* 2 (2) Spring 1988: 41-58.
- Kotlikoff, Laurence J., and Lawrence H. Summers (1981). "The Role of Intergenerational Transfers and Life Cycle Saving in Aggregate Capital Accumulation," *Journal of Political Economy* 89 (4) August 1981: 706-732.
- Laitner, John, and F. Thomas Juster (1996). "New Evidence on Altruism: A Study of TIAA-CREF Retirees," *American Economic Review* 86 (4) September 1996: 893-908.
- Lazear, Edward P. (1979). "Why is there Mandatory Retirement?" *Journal of Political Economy* 87 (6) December 1979: 1261-1284.
- Lazear, Edward P. (1981). "Agency, Earnings Profiles, Productivity, and Hours Restrictions," *American Economic Review* 71 (4) September 1981: 606-620.
- Lebergott, Stanley (1964). *Manpower in Economic Growth: The American Record Since 1800*. McGraw-Hill, 1964.
- Lebergott, Stanley (1976). "Review of Men and Wealth in the United States, 1850-1870 by Lee Soltow," *Journal of Economic History* 36 (3) September 1976: 795-797.
- Lee, Chulhee (2001). "Life Cycle Saving in the United States, 1900-1990," *Review of Income and Wealth* 47 (2) June 2001): 165-179.
- Lee, Chulhee (1998). "Long-Term Unemployment and Retirement in Early-Twentieth-Century America," *Journal of Economic History* 58 (3) September 1998: 844-856.
- Leff, Nathaniel H. (1969). "Dependency Rates and Savings Rates," *American Economic Review* 59 (5) December 1969: 886-896.
- Leibenstein, Harvey (1975). "The Economic Theory of Fertility Decline," *Quarterly Journal of Economics* 89 (1) February 1975: 1-31.
- Lewis, Frank D. (1983). "Fertility and Savings in the United States: 1830-1900," *Journal of Political Economy* 91 (5) October 1983: 825-840.

- Li, Xiaoyan; Michael Hurd; and David S. Loughran (2008). "The Characteristics of Social Security Beneficiaries Who Claim Benefits at the Early Entitlement Age," *AARP Research Report*, Number 2008-19, AARP Public Policy Institute, November 2008.
- Long, Clarence D. (1958). *The Labor Force under Changing Income and Employment*, National Bureau of Economic Research, Princeton University Press, 1958.
- Maine, Bureau of Industrial and Labor Statistics (1891), *Fifth Annual Report of the Bureau of Industrial and Labor Statistics for the State of Maine, 1891*, Burleigh and Flynt, 1892.
- Margo, Robert (1988). "Interwar Unemployment in the United States: Evidence from the 1940 Census Sample," Barry Eichengreen and Timothy Hatton, editors, *Interwar Unemployment in International Perspective*, Kluwer Academic Publishers, 1988.
- Margo, Robert A. (1993). "The Labor Force Participation of Older Americans in 1900: Further Results." *Explorations in Economic History* 30 (3) Month 1993: 409-23.
- Masson, André, and Pestieau Pierre (1997). "Bequest Motives and Models of Inheritance: A Survey of the Literature," Chapter 3 in Guido Erreygers and Toon Vandeveld, editors, *Is Inheritance Legitimate? Ethical and Economic Aspects of Wealth Transfers*, Springer, 1997: 54-88.
- Michigan, Bureau of Labor and Industrial Statistics (1888). *Sixth Annual Report, February 1, 1889* [sic, read 1888], Lansing, Thorp & Godfrey, State Printers and Binders, 1889.
- Michigan, Bureau of Labor and Industrial Statistics (1889). *Seventh Annual Report, February 1, 1889*, Lansing, Thorp & Godfrey, State Printers and Binders, 1890.
- Michigan, Bureau of Labor and Industrial Statistics (1890). *Eighth Annual Report 1890*, Lansing, Robert Simt & Co., State Printers and Binders, 1891.
- Michigan, Bureau of Labor and Industrial Statistics (1893). *Eleventh Annual Report, February 1, 1894*, Lansing, Robert Smith & Co., State Printers and Binders, 1894.
- Michigan, Bureau of Labor and Industrial Statistics (1895). *Thirteenth Annual Report for the year Ending February 1, 1896*. Lansing: Robert Smith & Co., State Printers and Binders, 1896.
- Miller, Sally M. (1973). *Victor Berger and the Promise of Constructive Socialism, 1910-1920*. Greenwood Press, 1973.
- Mirer, Thad W. (1979). "The Wealth-Age Relation among the Aged," *American Economic Review* 69 (3) June 1979: 435-443.
- Missouri, Bureau of Labor Statistics and Inspection (1892). *Fourteenth Annual Report 1892*, Jefferson City, Tribune Printing Company, State Printers and Binders, 1892.
- Modigliani, Franco (1966). "The Life-Cycle Hypothesis of Saving: The Demand for Wealth and the Supply of Capital," *Social Research* 33 (2) Summer 1966: 160-217.
- Modigliani, Franco (1986). "Life Cycle, Individual Thrift, and the Wealth of Nations," *American Economic Review* 76 (3) June 1986: 297-313.

- Modigliani, Franco (1988). "The Role of Intergenerational Transfers and Life Cycle Saving in the Accumulation of Wealth," *Journal of Economic Perspectives* 2 (2) Spring 1988: 15-40.
- Modigliani, Franco (2001). *Adventures of an Economist*, Texere, 2001.
- Modigliani, Franco, and Arlie Sterling (1983). "Determinants of Private Saving with Special Reference to the Role of Social Security – Cross-country Tests," Franco Modigliani and Richard Hemming, editors, *The Determinants of National Saving and Wealth*, Macmillan Press, 1983: 24-55.
- Modigliani, Franco, and Richard Brumberg (1954). "Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data," in Kenneth K. Kurihara, editor, *Post-Keynesian Economics*, Rutgers University Press, 1954: 388-436.
- Modigliani, Franco, and Tullio Jappelli (1987). "Fiscal Policy and Saving in Italy since 1860," Michael J. Boskin, John S. Flemming, and Stefano Gorini, editors, *Private Saving and Public Debt*, Basil Blackwell 1987: 126–170.
- Moen, Jon R. (1987). "The Labor of Older Americans: A Comment," *Journal of Economic History* 47 (3) September 1987: 761-767.
- Moen, Jon R. (1994). "The Unemployment and Retirement of Older Men: Further Evidence from the 1900 and 1910 Censuses," *Historical Methods* 27 (1) 1994: 40-46.
- New Jersey Bureau of Statistics of Labor and Industries (1889). *Twelfth Annual Report of the Bureau of Statistics of Labor and Industries of New Jersey for the Year Ending October 31, 1889*, Trenton: F.F. Paterson, 1889.
- New Jersey Bureau of Statistics of Labor and Industries (1890). *Thirteenth Annual Report of the Bureau of Statistics of Labor and Industries of New Jersey for the Year Ending October 31, 1890*, Trenton: Electric Printing Company, 1890.
- New Jersey Bureau of Statistics of Labor and Industries (1891). *Fourteenth Annual Report of the Bureau of Statistics of Labor and Industries of New Jersey for the Year Ending October 31, 1891*, Trenton: John L. Murphy, 1891.
- Nugent, Jeffrey B. (1985). "The Old-Age Security Motive for Fertility," *Population and Development Review* 11 (1) March 1985: 75-97.
- Officer, Lawrence H. (2009). *Two Centuries of Compensation for U.S. Production Workers in Manufacturing*, Palgrave, 2009.
- Oppenheimer, Valerie Kincade (1982). *Work and the Family: A Study in Social Demography*, Academic Press, 1982.
- Parker, William N. (1974). "Review of Patterns of Wealthholding in Wisconsin Since 1850 by Lee Soltow," *Journal of Interdisciplinary History* 4 (3) Winter, 1974: 502-505.
- Parker, William N. (1975). "Forward," in Lee Soltow, *Men and Wealth in the United States, 1850-1870*, Yale University Press, 1975: xiii-xv.
- Poterba, James M. (1994). "Introduction," James M. Poterba, editor, *International Comparisons of Household Saving*, University of Chicago Press, 1994: 1-10.

- Ransom, Roger L., and Richard Sutch (1986). "The Labor of Older Americans: Retirement of Men On and Off the Job, 1870-1937," *Journal of Economic History* 46 (1) March 1986: 1-30.
- Ransom, Roger L., and Richard Sutch (1986). "The Life-Cycle Transition: A Preliminary Report on Wealth-Holding in America," Chapter 10 in *Income and Wealth Distribution in Historical Perspective*, two volumes. Utrecht: Rijksuniversiteit te Utrecht, 1986: volume 1.
- Ransom, Roger L., and Richard Sutch (1987). "Tontine Insurance and the Armstrong Investigation: A Case of Stifled Innovation, 1868-1905," *Journal of Economic History* 47 (2) June 1987: 379-390.
- Ransom, Roger L., and Richard Sutch (1988). "Capitalists Without Capital: The Burden of Slavery and the Impact of Emancipation," *Agricultural History* 62 (3) Summer 1988: 133-160.
- Ransom, Roger L., and Richard Sutch (1989). "The Trend in the Rate of Labor Force Participation of Older Men, 1870-1930," *Journal of Economic History* 49 (1) March 1989: 170-183.
- Ransom, Roger L., and Richard Sutch (1989). "Two Strategies for a More Secure Old Age: Life-Cycle Saving by Late-Nineteenth-Century American Workers," *Working Papers on the History of Saving*, Number 6, Institute of Business and Economic Research, University of California, Berkeley, March 1989.
- Ransom, Roger L., and Richard Sutch (1995). "The Impact of Aging on the Employment of Men in American Working-Class Communities at the End of the Nineteenth Century," Chapter 11 in David I. Kertzer and Peter Laslett, editors, *Aging in the Past: Demography, Society, and Old Age*, University of California Press, 1995: 303-327.
- Ransom, Roger L.; Richard Sutch; and Samuel H. Williamson (1991). "Retirement: Past and Present," Chapter 1 in Alicia H. Munnell, editor, *Retirement and Public Policy: Proceedings of the Second Conference of the National Academy of Social Insurance*, Kendall Hunt Publishing, 1991: 23-57.
- Ransom, Roger L.; Richard Sutch; and Samuel H. Williamson (1993). "Inventing Pensions: The Origins of the Company-Provided Pension in the United States, 1900-1940," Chapter 1 in K. Warner Schaie and W. Andrew Achenbaum, editors, *Societal Impact on Aging: Historical Perspectives*, Springer Publishing, 1993: 1-44.
- Rees, Albert (1961). *Real Wages in Manufacturing: 1890-1914*, National Bureau of Economic Research, Princeton University Press, 1961.
- Rho, Hye Jin (2010). "Hard Work? Patterns in Physically Demanding Labor Among Older Workers," Center for Economic Policy Research, August 2010.
- Rhode, Paul W. (2002). "Gallman's Annual Output Series for the United States, 1834-1909," *NBER Working Paper Series*, Number 8860, National Bureau of Economic Research, April 2002.
- Ruggles, Steven; J. Trent Alexander; Katie Genadek; Ronald Goeken; Matthew B. Schroeder; and Matthew Sobek (2010). *Integrated Public Use Microdata Series: Version 5.0* [Machine-readable database]. Minneapolis: University of Minnesota, 2010.
- Short, Joanna (2002). "Economic History of Retirement in the United States," Robert Whaples, editor, *EH.Net Encyclopedia*, September 2002.
- Soltow, Lee (1971). *Patterns of Wealthholding in Wisconsin Since 1850*, University of Wisconsin Press, 1971.
- Soltow, Lee (1975). *Men and Wealth in the United States, 1850-1870*, Yale University Press, 1975.

- Squier, Lee Welling (1912). *Old Age Dependency in the United States: A Complete Survey of the Pension Movement*, Macmillan, 1912.
- Steckel, Richard H. (1992). "The Fertility Transition in the United States: Tests of Alternative Hypotheses," Chapter 12 in Claudia Goldin and Hugh Rockoff, editors, *Strategic Factors in Nineteenth Century American Economic History*, University of Chicago Press, 1992:351-397.
- Sundstrom, William A. (2006). "Hours and Working Conditions," in Susan B. Carter et al, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Volume 2, Cambridge University Press 2006: 46-54.
- Sutch, Richard (1991). "All Things Reconsidered: The Life-Cycle Perspective and the Third Task of Economic History," *Journal of Economic History* 51 (2) June 1991: 271-288.
- Sutch, Richard (2006). "National Income and Product," Chapter Ca in Volume III of Susan B. Carter et al, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Cambridge University Press, 2006: 3-69.
- Sutch, Richard (2006). "Saving, Capital, and Wealth," Chapter Ce in Volume III of Susan B. Carter et al, editors, *Historical Statistics of the United States: Earliest Time to the Present*, Millennial Edition, Cambridge University Press, 2006: 287-332.
- Sutch, Richard (2009). "Modigliani, Franco (1918-2003) [The Economic Contributions of Franco Modigliani]." In Larry Blume and Steven Durlauf, general editors, *The New Palgrave Dictionary of Economics*, 2nd edition, Palgrave Macmillan, 2009.
- Tucker, David M. (1991). *The Decline of Thrift in America: Our Cultural Shift from Saving to Spending*, Praeger, 1991.
- Twain, Mark [pseudonym of Samuel Langhorne Clemens] (1885). *The Adventures of Huckleberry Finn*, downloaded from [http://www.online-literature.com/twain/huckleberry\\_finn/](http://www.online-literature.com/twain/huckleberry_finn/).
- "Typhoid Fever Among Plumbers" (1894). *Journal of the American Medical Association* 23 (18) 1894: 691.
- U.S. Bureau of the Census (1900). *Special Reports: Occupations at the Twelfth Census*, U.S. Government Printing Office, 1904.
- U.S. Bureau of the Census (1975). *Historical Statistics of the United States, Colonial Times to 1970*, Bicentennial Edition, two volumes, Government Printing Office, 1975.
- U.S. Bureau of the Census (1975). *Historical Statistics of the United States, Colonial Times to 1970*, Bicentennial Edition, two volumes, Government Printing Office, 1976.
- U.S. Census Office (1870). *Statistics of the Population of the United States from the Original Returns of the Ninth Census (June 1, 1870)*. Government Printing Office, 1872.
- U.S. Census Office (1880). *Statistics of the Population of the United States at the Tenth Census (June 1, 1880)*. Government Printing Office, 1883.
- U.S. Census Office (1890). "Iron Ores," by John Birkenbine in *Report on Mineral Industries in the United States at the Eleventh Census: 1890*, Final Reports Volume 7, Government Printing Office: 1892: 1-30.



- U.S. Census Office (1890). *Report on Population of the United States at the Eleventh Census: 1890*, Final Reports Volume I, Part II, Government Printing Office: 1897.
- U.S. Census Office (1900). *Twelfth Census of the United States Taken in the Year 1900; Manufactures*, Volume 7, Part 1, Government Printing Office, 1902.
- U.S. Social Security Administration (1986). "Increasing the Social Security Retirement Age: Older Workers in Physically Demanding Occupations or Ill Health," *Social Security Bulletin*, 49 (10) October 1986: 5-23.
- Vedder, Richard (2005). [Obituary of Lee Solow], *EH.news*, May 18, 09:52:15 EDT, 2005. Download from <http://eh.net/pipermail/eh.news/2005-May/000836.html>
- Vickers, Daniel (2010), "Errors Expected: The Culture of Credit in Rural New England, 1750–1800," *Economic History Review* 63 (4) November 2010: 1032-1057.
- Weeks, Joseph D., U.S. Census Office, 1880 (1886). *Report on the Statistics of Wages in the Manufacturing Industries with Supplementary Reports on the Average Retail Prices of Necessities of Life and on Trade Societies, and Strikes and Lockouts*, 1880 Census, volume 20, U.S. Government Printing Office, 1886.
- Weir, David R. (1992). "A Century of U.S. Unemployment, 1890-1990: Revised Estimates and Evidence for Stabilization." *Research in Economic History* 14 (1992): 301-46.
- White, Betsy Buttrill (1978). "Empirical Tests of the Life Cycle Hypothesis," *American Economic Review* 68 (4) September 1978: 547-560.
- White, Betsy Buttrill (1984). "Empirical Tests of the Life Cycle Hypothesis: Reply," *American Economic Review* 74 (1) March 1984: 258-259.
- Wisconsin, Bureau of Labor, Census and Industrial Statistics (1895), *Seventh Biennial Report, 1895-1896*, Madison, Democrat Printing Co., State Printer, 1896.
- Wright, Carroll D., U.S. Congress, Senate Committee on Finance (1893). *Wholesale Prices, Wages, and Transportation, Report by Mr. [Nelson W.] Aldrich [Chairman] from the Committee on Finance*, 52<sup>nd</sup> Congress, 2<sup>nd</sup> Session, Senate Report 1394, Government Printing Office, March 3, 1893.

Hard Work, Nonemployment, and the Life Cycle  
Table 1

Worker Surveys Used in This Study						
Year	State		Description	Male respondents	Percent 60 and over†	Source Codebook
1884-1886	Kansas	*	Manufacturing Workers	1,165	3.3	KS1-3
1884	Iowa	*	Teachers	181	1.3	IO01
1888	Michigan	*	"Stone" Workers	718	2.3	MI06
1889	Michigan	*	Furniture Workers	5,203	2.6	MI07
1890	Michigan		Agricultural Implement and Iron Workers	8,837	2.9	MI08A + MI08B
1890	Maine	*	Manufacturing Workers	1,012	3.9	ME05
1891	Missouri		Wage Workers	259	2.2	MO14
1892	California	*	Wage Earners	2,824	3.7	CA05
1893	Michigan	*	Railroad employees	6,051	3.2	MI11
1894	Michigan	*	Farm Laborers	5,600	2.0	MI12B
1895	Wisconsin		Workers	1,476	1.9	WI07B
1895	Michigan		Street Railway Workers	1,200	0.1	MI13C
1895	Michigan	*	Employees of Hack and Bus Lines	1,950	2.1	MI13A
1895	Michigan	*	Owners of Hacks and Drays	1,250	9.2	MI13B
1895	Kansas		Wage Earners	514	4.1	KS11
1896	Kansas		Wage Earners	539	1.6	KS12
1897	Kansas		Wage Earners	1,204	1.4	KS13
1899	Kansas		Workers	834	3.5	KS15
<hr/>						
1880	US		IPUMS 10%, Males 25 and over		10.3	
1900	US		IPUMS 5%, Males 25 and over		13.8	

\* Also analyzed by Ransom and Sutch [1995].

† Percent of those 25 years old and over.

The codebooks are identified by their identifiers. See Carter, Ransom, Sutch, and Zhao 1993.

Hard Work, Nonemployment, and the Life Cycle  
Table 2

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

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

Hard Work, Nonemployment, and the Life Cycle  
Table 3

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

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

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

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

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

Hard Work, Nonemployment, and the Life Cycle  
 Table 4

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

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

Hard Work, Nonemployment, and the Life Cycle  
Table 5

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

---

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

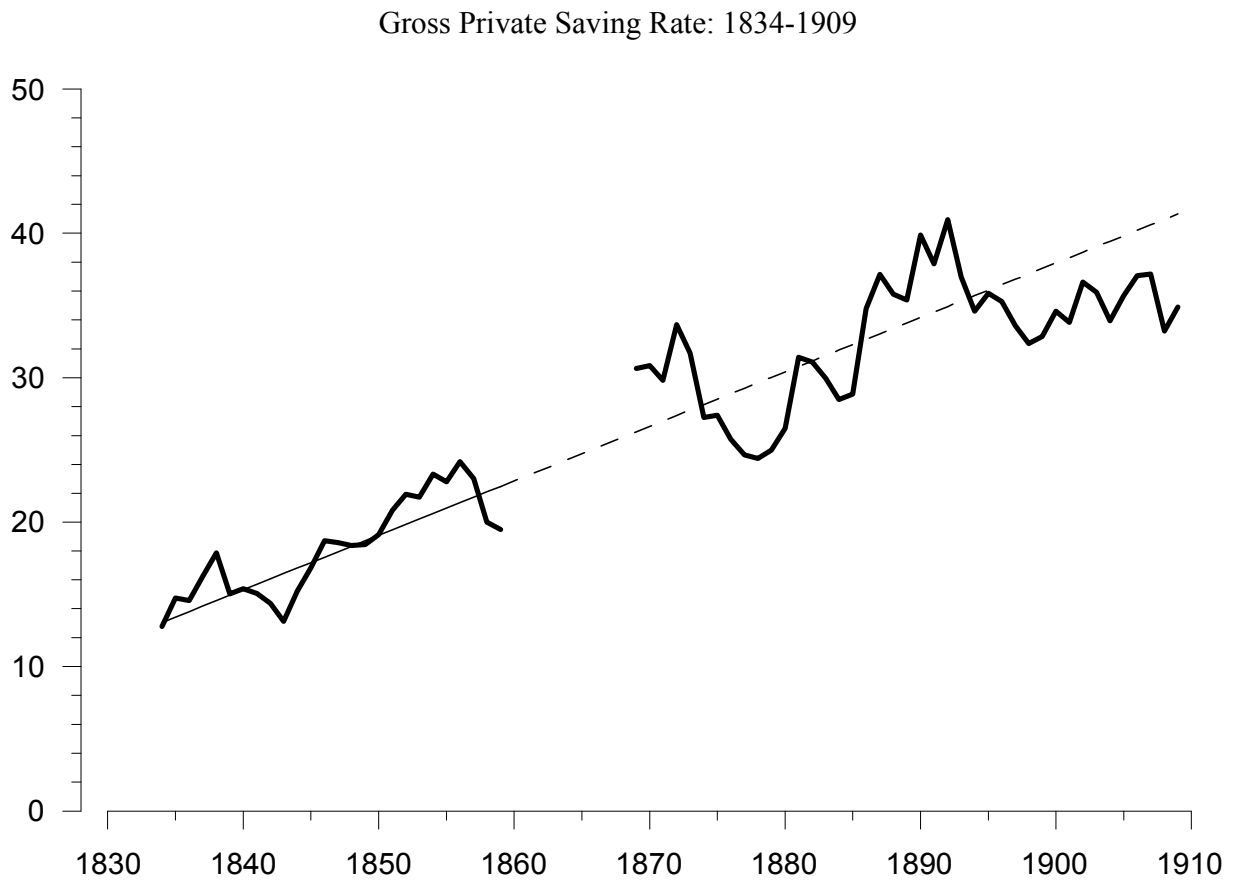
---

Hard Work, Nonemployment, and the Life Cycle  
 Table 6

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

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

Hard Work, Nonemployment, and the Life Cycle  
Figure 1

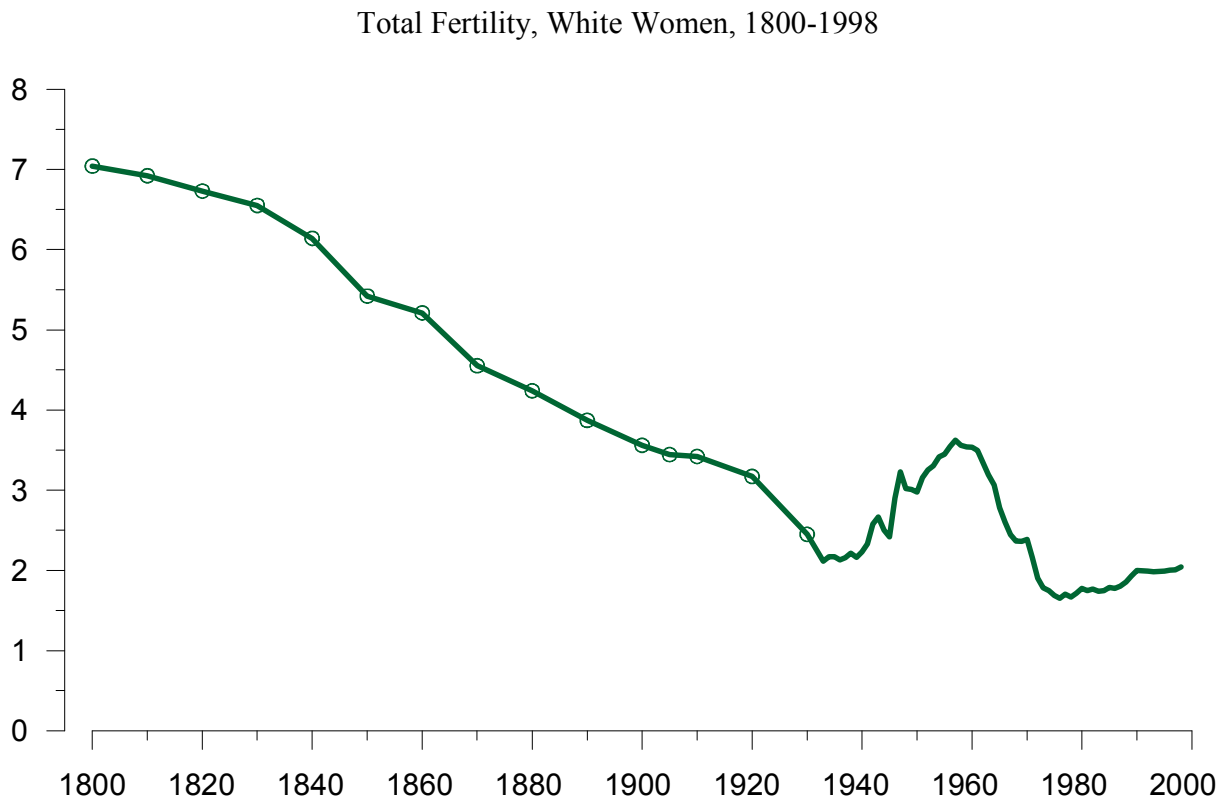


Source: Based on Sutch, "Saving, Capital, and Wealth," 2006: Figure Ce-E, p. 292.

Note: There are no estimates spanning the decade of the Civil War. The solid straight line is a trend fitted to the antebellum data. The dashed line extrapolates that trend into the postwar years.



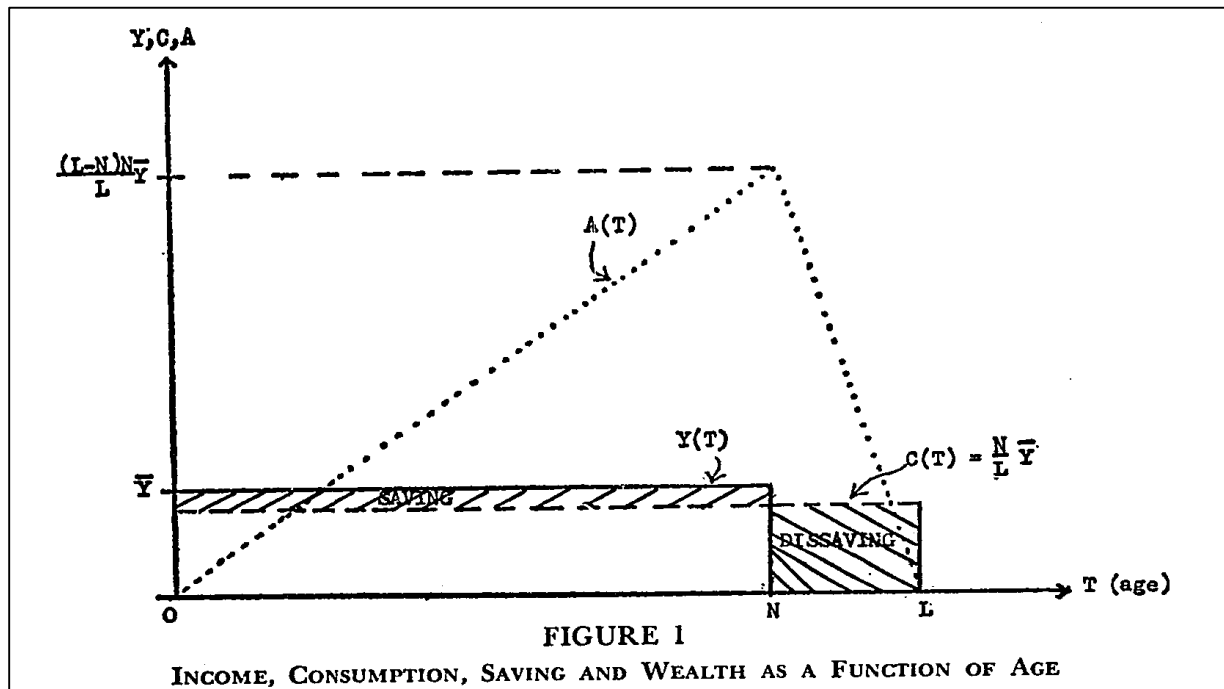
Hard Work, Nonemployment, and the Life Cycle  
Figure 2



Source: Based on Carter et al 2006: Figure Pa-C, p. 12, Series Ab63. The estimates for 1800-1930 are originally from Coale and Zelnik 1963: 36.

Note: The total fertility rate is an age-adjusted rate. The rate for each year is calculated assuming a hypothetical group of 1,000 women were to have the same birth rate at each age as was observed in the cross-section of women that year. If so, they would have a certain number of children by the time they reached the end of their reproductive period. The total fertility rate is usually expressed per 1,000 women. By dividing the total fertility rate by 1,000 the chart offers an estimate of the number of children that would be born to a woman in her lifetime assuming she survived to the end of the child-bearing period.

Hard Work, Nonemployment, and the Life Cycle  
 Figure 3



The “trademark” of the life cycle hypothesis of saving. Reproduced from Franco Modigliani, “The Life Cycle Hypothesis of Saving, the Demand for Wealth and the Supply of Capital,” *Social Research* 33(2) Summer 1966: 165.

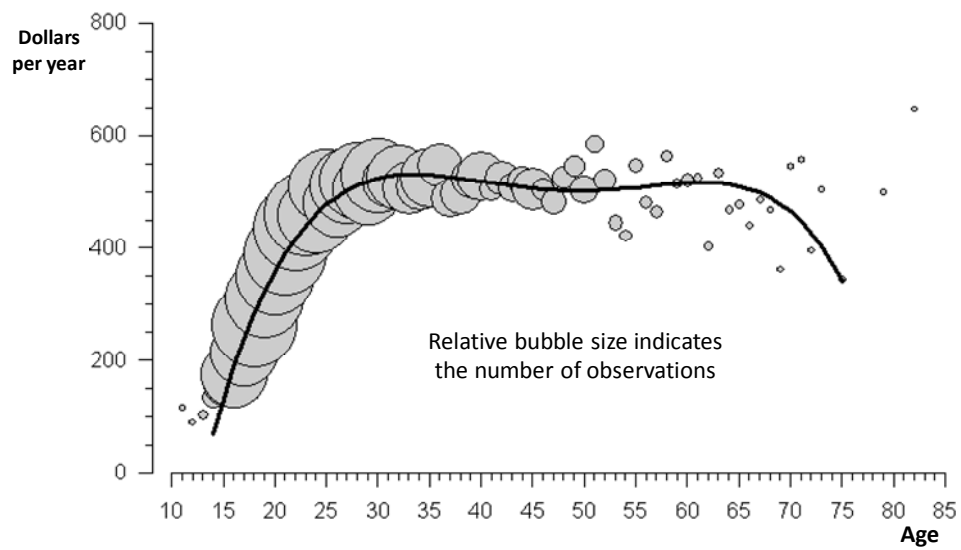
Hard Work, Nonemployment, and the Life Cycle  
Figure 4



Source: Calculated from the variables *mounemp*, *labforce*, *qocc* in the 5% IPUMS sample of the 1900 Census. Forth-degree polynomial fit over the age range 16 to 80. N=987,053.

Hard Work, Nonemployment, and the Life Cycle  
Figure 5

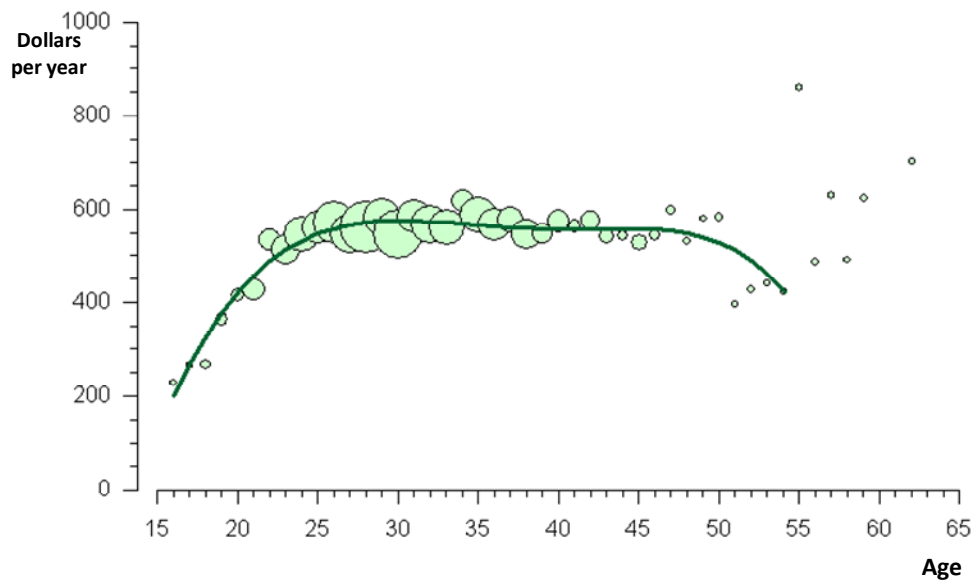
**Age Profile of Median Annual Earnings  
Survey of Michigan Agricultural Implement and Iron Workers, 1890**



Source: Variable *totear* from Carter, Ransom, Sutch, and Zhao [*MI08A and MI08B* 1993].  
Fifth-degree polynomial fit by *qreg*. Range: 14-75. N=8,837.

Hard Work, Nonemployment, and the Life Cycle  
Figure 6

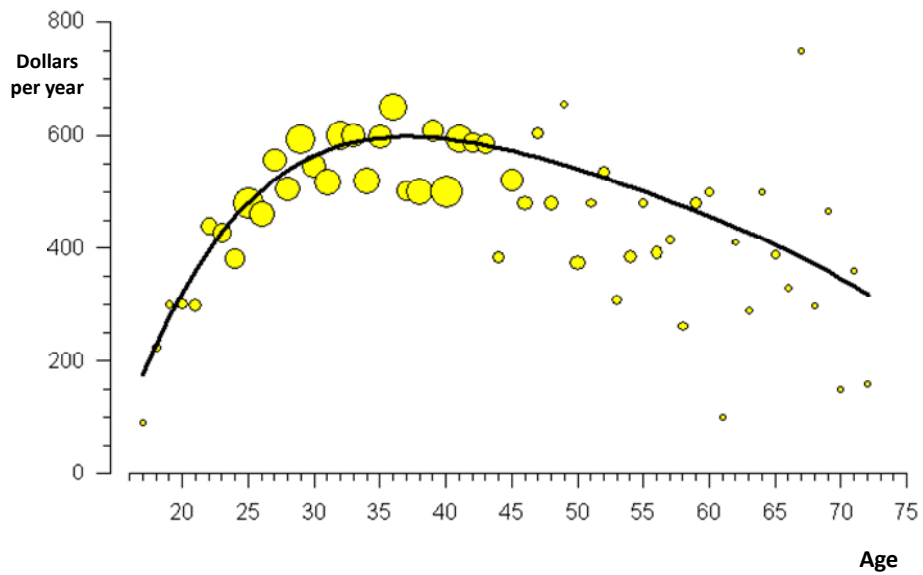
**Age Profile of Median Annual Earnings  
Survey of Michigan Street Railway Employees, 1895**



Source: Variable *totear* from Carter, Ransom, Sutch, and Zhao [*MI13C 1993*].  
Fifth-degree polynomial estimated with *qreg*. Range: 16-54. N=1,200.

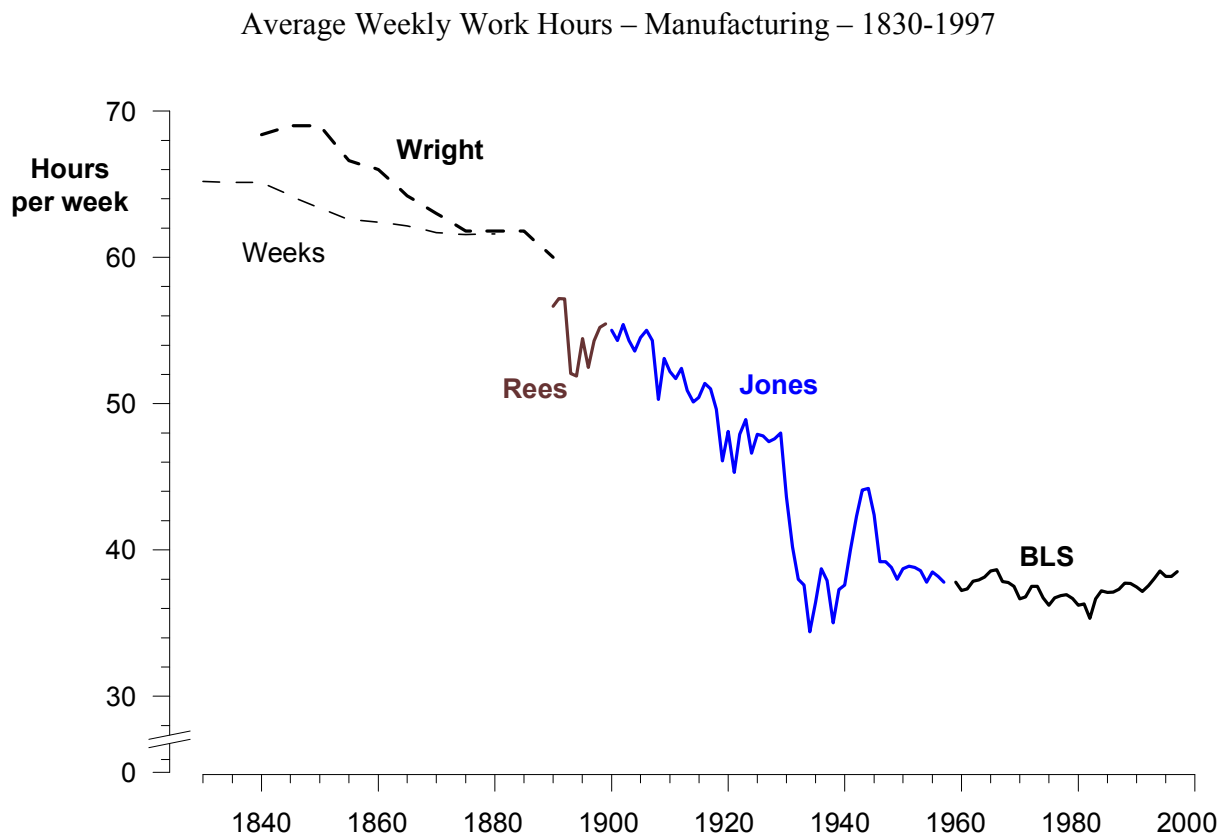
Hard Work, Nonemployment, and the Life Cycle  
Figure 7

**Age Profile of Median Annual Earnings from Wages  
Survey of Male Kansas Workers, 1899**



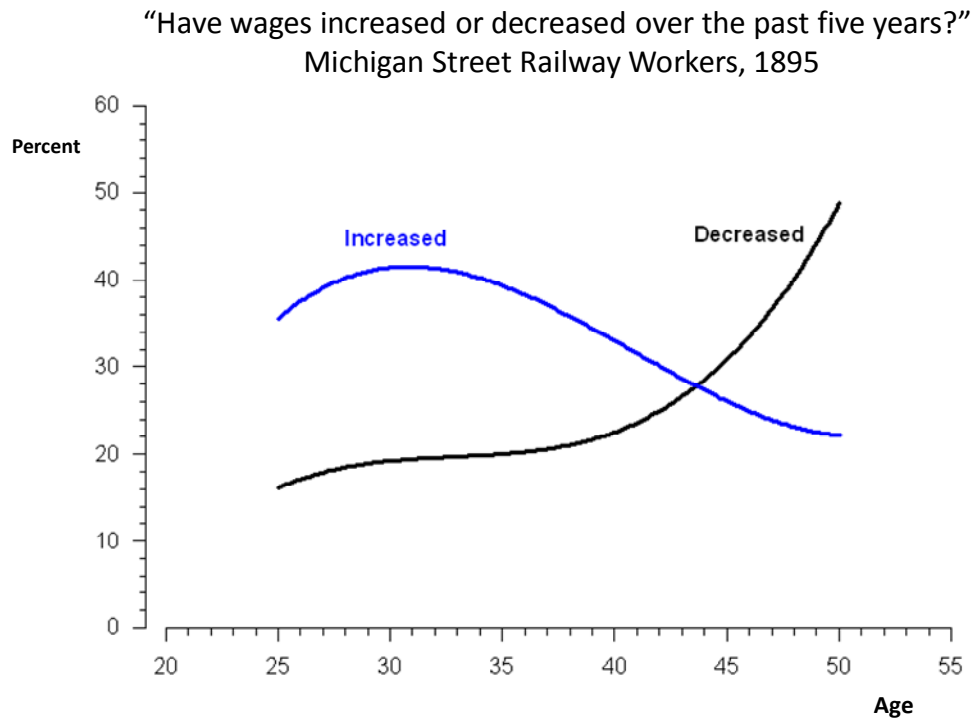
Source: Variable *wage* from Carter, Ransom, Sutch, and Zhao [KS15 1993].  
Fifth-degree polynomial estimated by qreg. N=927 men.

Hard Work, Nonemployment, and the Life Cycle  
Figure 8



Source: Based on Sundstrom 2006: figure Ba-O, p. 47. The original data are from Weeks 1886: xxviii; Wright 1893: 179; Rees 1911: table 10, p. 33, and table 13, pp. 44-50; Jones 1963: table 1, p. 375; and U.S. Bureau of Labor Statistics as reported in Carter et al 2006, Series Ba4580.

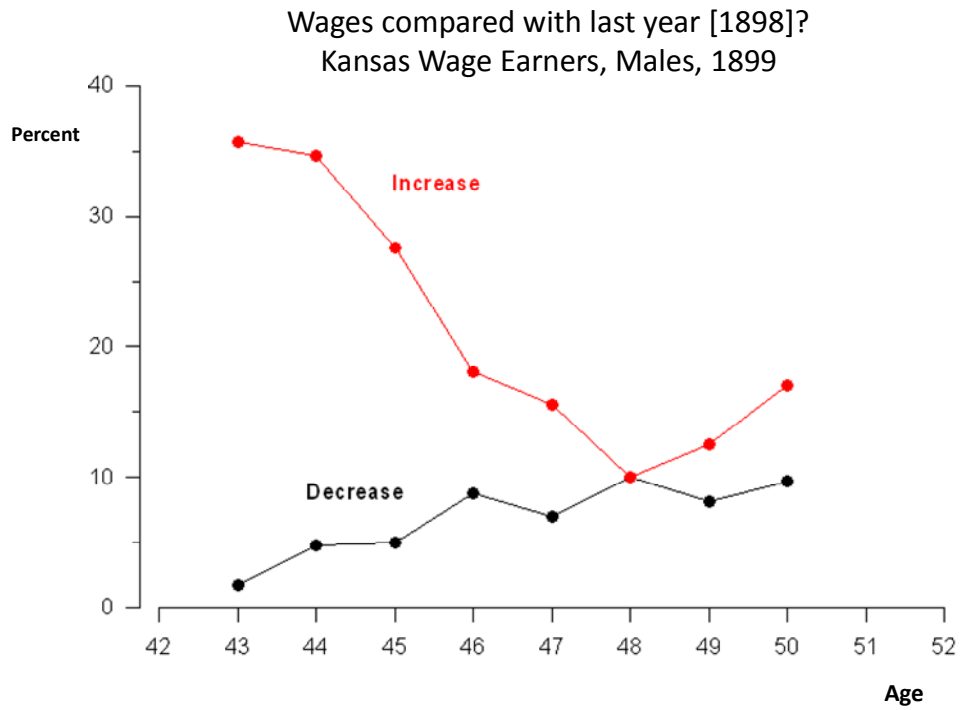
Hard Work, Nonemployment, and the Life Cycle  
Figure 9



Source: Variable *wchg5* from Carter, Ransom, Sutch, and Zhao [*MI13C 1993*].  
Third-degree polynomials. Range: 25-54. N=1,200.



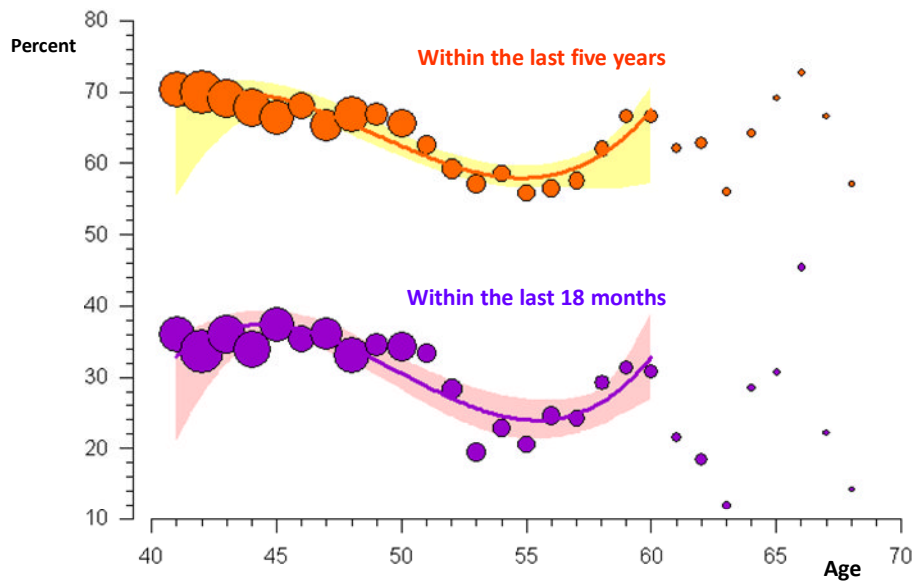
Hard Work, Nonemployment, and the Life Cycle  
Figure 10



Source: Variable *wgchg* from Carter, Ransom, Sutch, and Zhao [KS15 1993].  
Three-year moving average. N=927 men.

Hard Work, Nonemployment, and the Life Cycle  
Figure 11

Percent of Workers Who have Recently Changed Employers  
Michigan, Furniture Industry, 1889



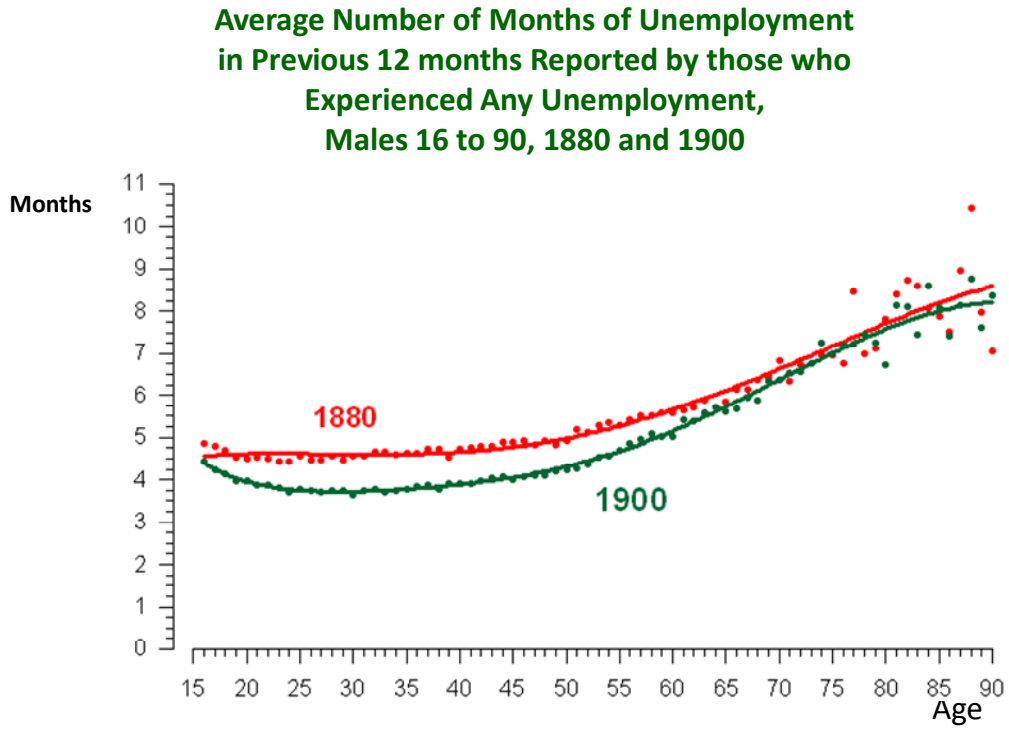
Source: Calculated from variable *jobchg* from Carter, Ransom, Sutch, and Zhao [MI07, 1993].  
Third-degree polynomial. Range 41-60. N=791.

Hard Work, Nonemployment, and the Life Cycle  
Figure 12



Source: Calculated from the variables *mounemp*, *labforce*, *qocc* in the 10% IPUMS sample of the 1880 Census. Fifth-degree polynomial fit over the age range 16 to 89. N=1,468,489.

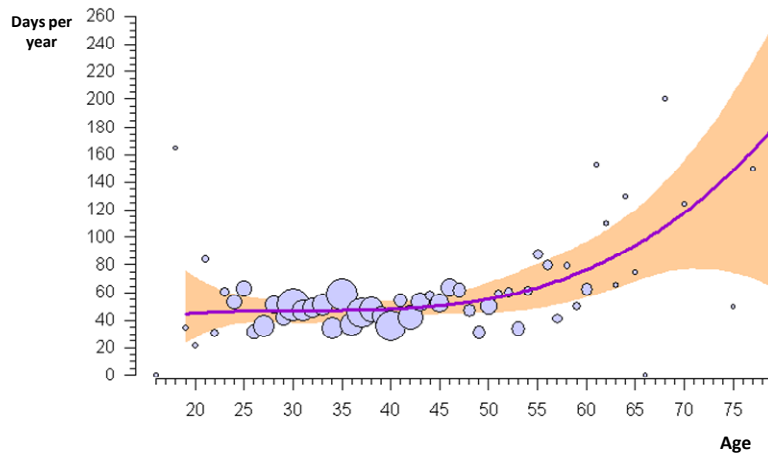
Hard Work, Nonemployment, and the Life Cycle  
Figure 13



Source: Calculated from the variables *mounemp*, *labforce*, *qocc* in the 10% sample of the 1880 census and the 5% IPUMS sample of the 1900 Census. Fourth-degree [1880] and sixth-degree [1900] polynomial fit over the age range 16 to 90. N=114,841 in 1880 and N=189,224 in 1900.

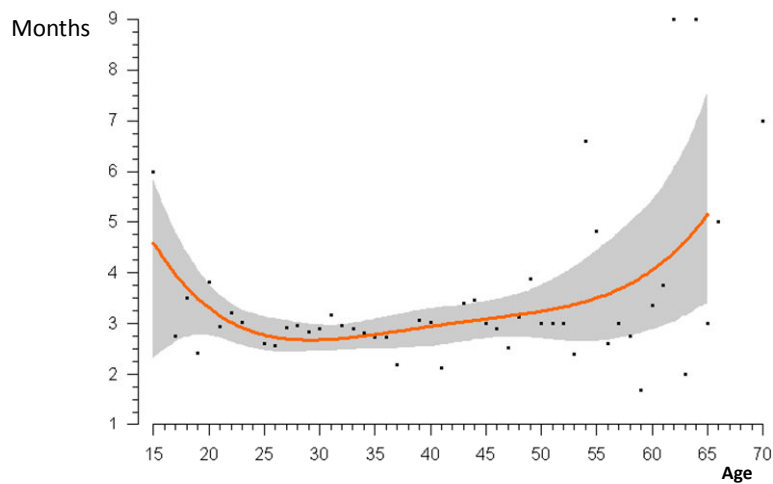
Hard Work, Nonemployment, and the Life Cycle  
Figure 14

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



Source: Variable *nowork* from Carter, Ransom, Sutch, and Zhao [KS3.1 1993].  
Third-degree polynomial. Range 19-79.

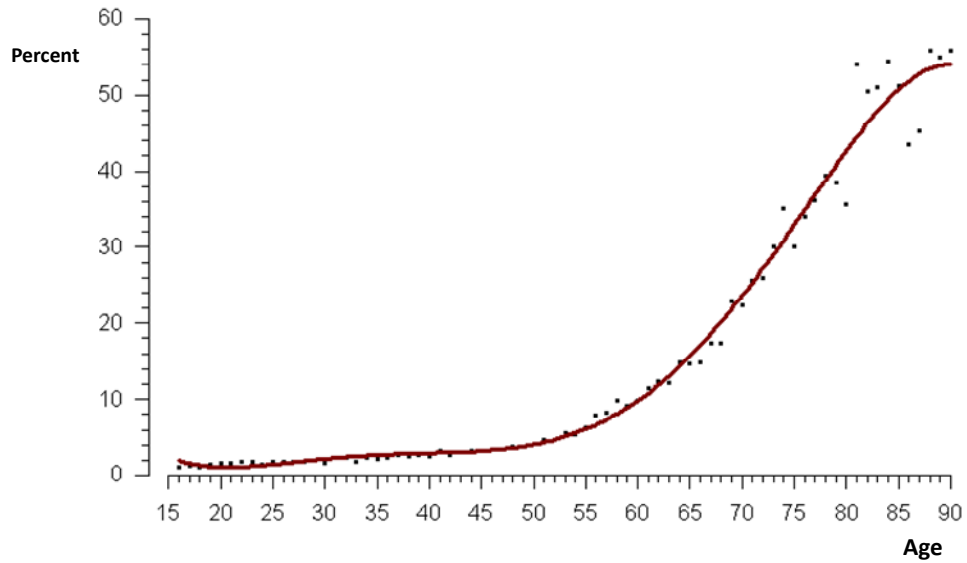
Age Profile of Average Number of Months Unemployed  
Survey of Wisconsin Workers, 1895



Source: Variable *months* from Carter, Ransom, Sutch, and Zhao [WI07C 1993]. Fourth-degree polynomial. Range: 15-65. N= 1,119.

Hard Work, Nonemployment, and the Life Cycle  
Figure 15

**Age Profile of the Percentage of Males, 16 to 90,  
who Report No Employment in the Previous  
Twelve Months , 1900**

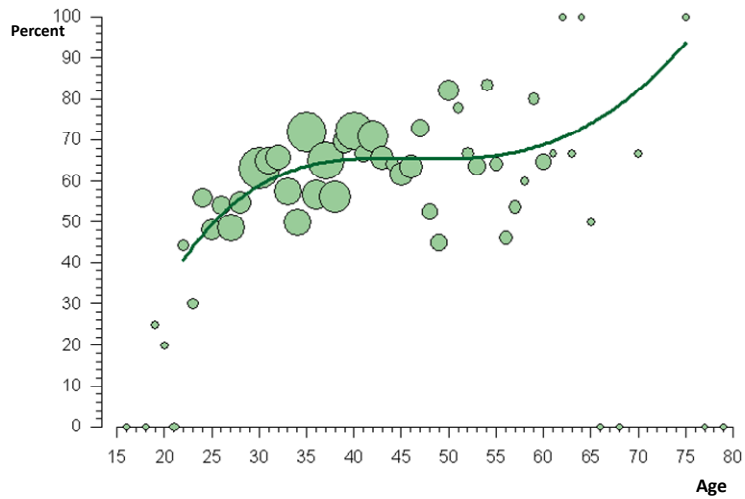


Source: Calculated from the variable *mounemp* in the 5% IPUMS sample of the 1900 Census.  
Fifth-degree polynomial fit over the age range 16 to 90. N=255,018.

# Hard Work, Nonemployment, and the Life Cycle

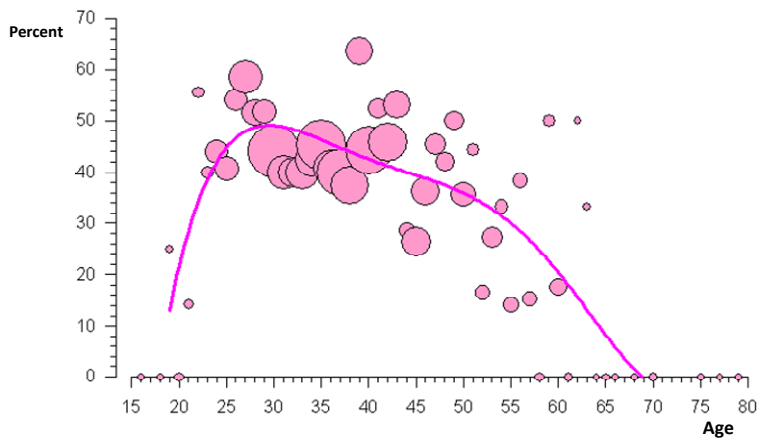
## Figure 16

**Percentage of Respondents who Accumulated Savings in Past Years**  
**Survey of Kansas Workers, 1885-1887**



Source: Variable *forsav* from Carter, Ransom, Sutch, and Zhao [KS3-1 1993]. Forth-degree polynomial fit over the age range 22 to 75. N=1,162.

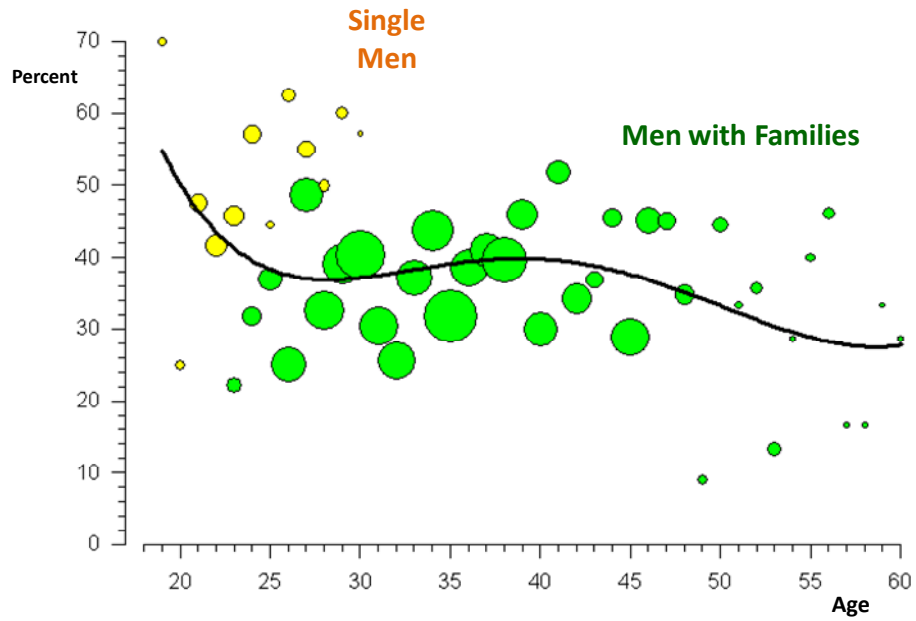
**Percentage of Respondents who Saved During the Past Year**  
**Survey of Kansas Workers, 1885-1887**



Source: Variable *ifsav* from Carter, Ransom, Sutch, and Zhao [KS3-1 1993]. Fifth-degree polynomial fit over the age range 19 to 70. N=1,162.

Hard Work, Nonemployment, and the Life Cycle  
Figure 17

Percentage of Respondents who Saved During the Past Year  
Survey of Wisconsin Workers , 1895



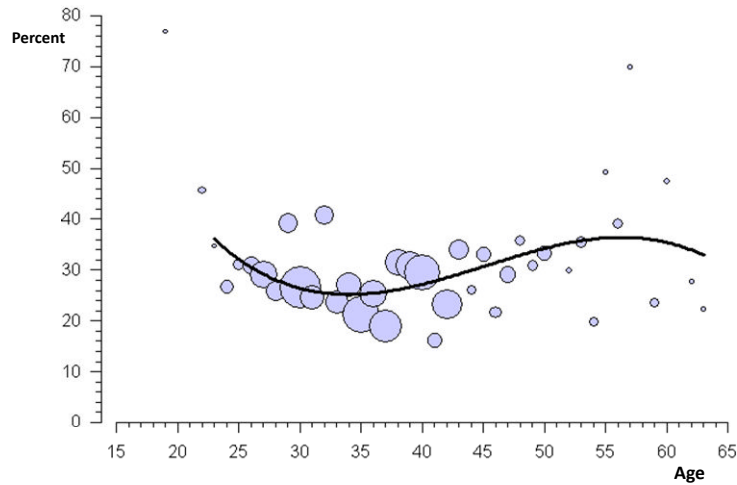
Source: Computed from variables *savings*, *expliv*, and *explivs* from Carter, Ransom, Sutch, and Zhao [W107C 1993]. Fifth-degree polynomial. Range: 19-60. Single men in yellow. Range: 19-30. N=239. Family men in green. Range: 23-60. N=1,125.



# Hard Work, Nonemployment, and the Life Cycle

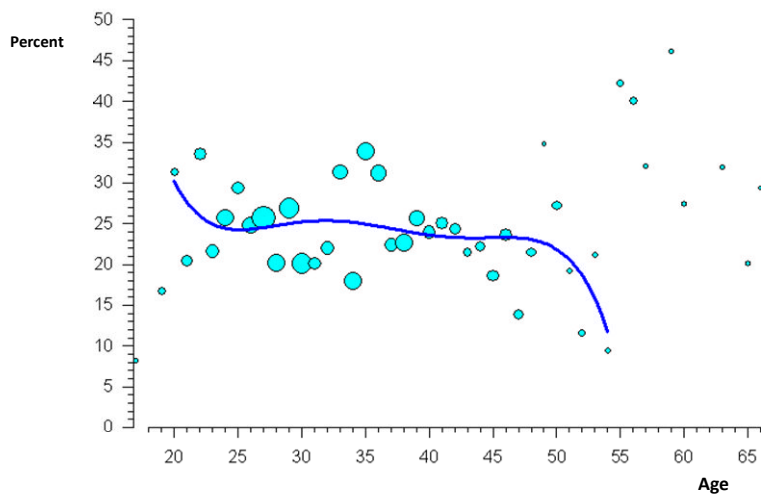
## Figure 18

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



Source: Variables *surplus* and *totear* from Carter, Ransom, Sutch, and Zhao [KS3-1 1993].  
Third-degree polynomial fit over the age range 23 to 63. N=380.

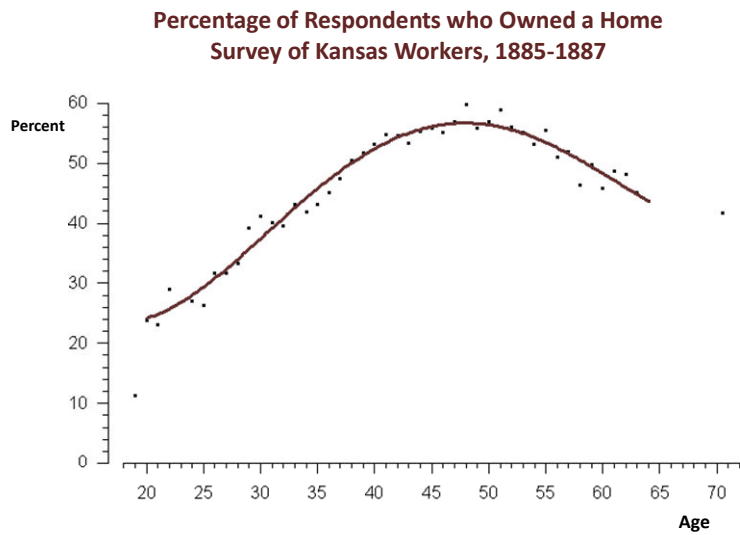
**Average Savings Rate of Respondents who Saved During the Past Year**  
**Survey of Wisconsin Workers, 1895**



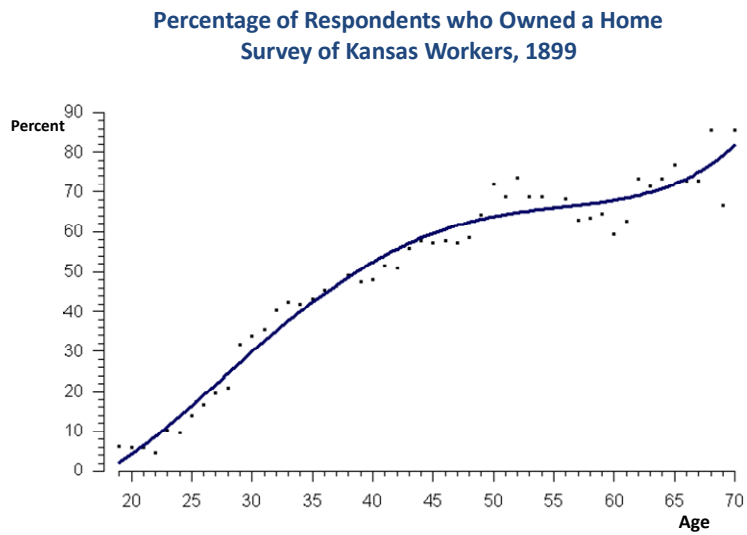
Source: Computed from variables *savings* and *totear* from Carter, Ransom, Sutch, and Zhao [WI07B 1993].  
Fifth-degree polynomial. Range: 20-54. N=531 savers.

# Hard Work, Nonemployment, and the Life Cycle

## Figure 19

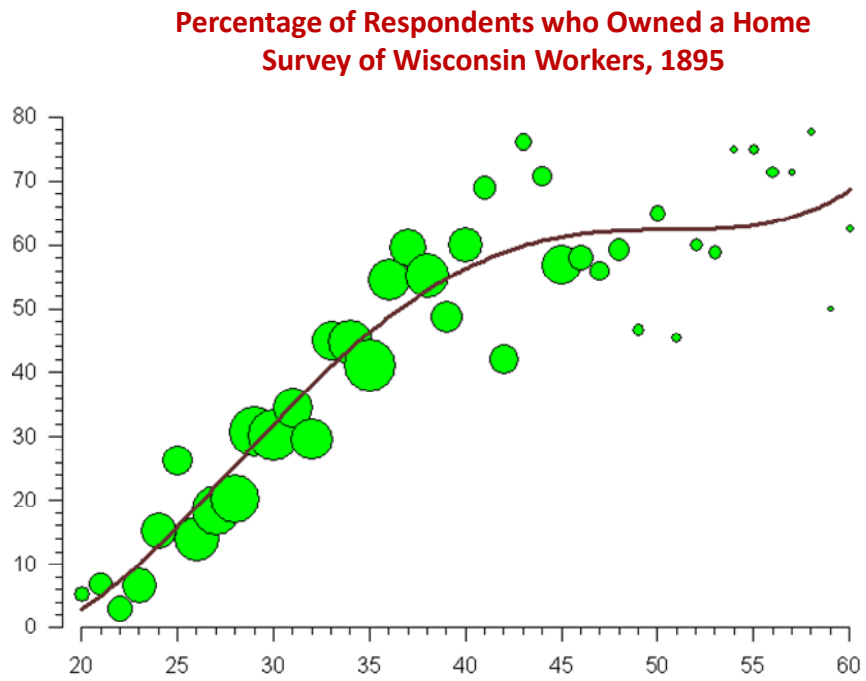


Source: Variable *ownhm* from Carter, Ransom, Sutch, and Zhao [KS3.1 1993]. Fourth-degree polynomial of a five-year moving average.

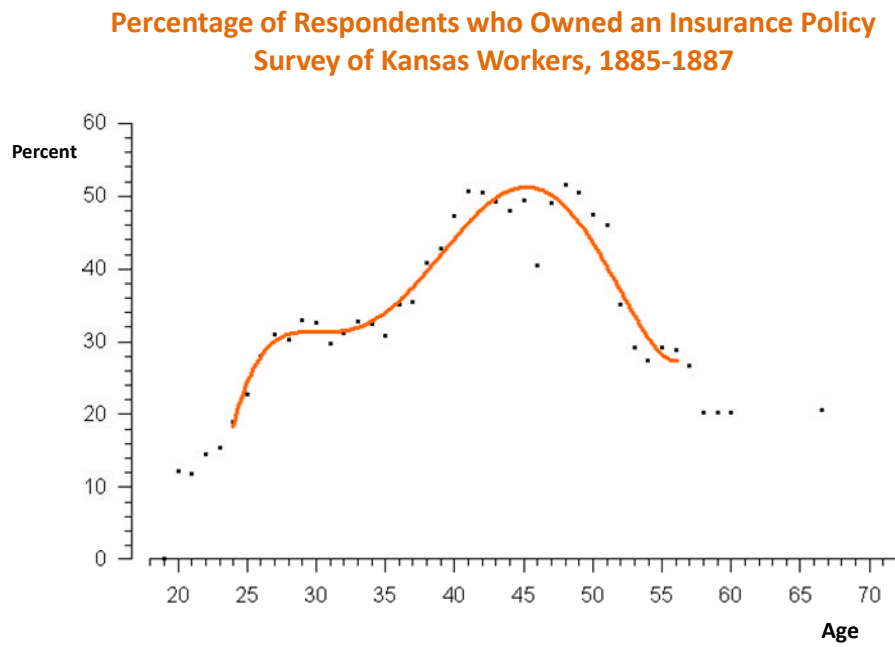


Source: Variable *ownhm* from Carter, Ransom, Sutch, and Zhao [KS15 1993]. Fourth-degree polynomial of a five-year moving average. N=916.

Hard Work, Nonemployment, and the Life Cycle  
Figure 20

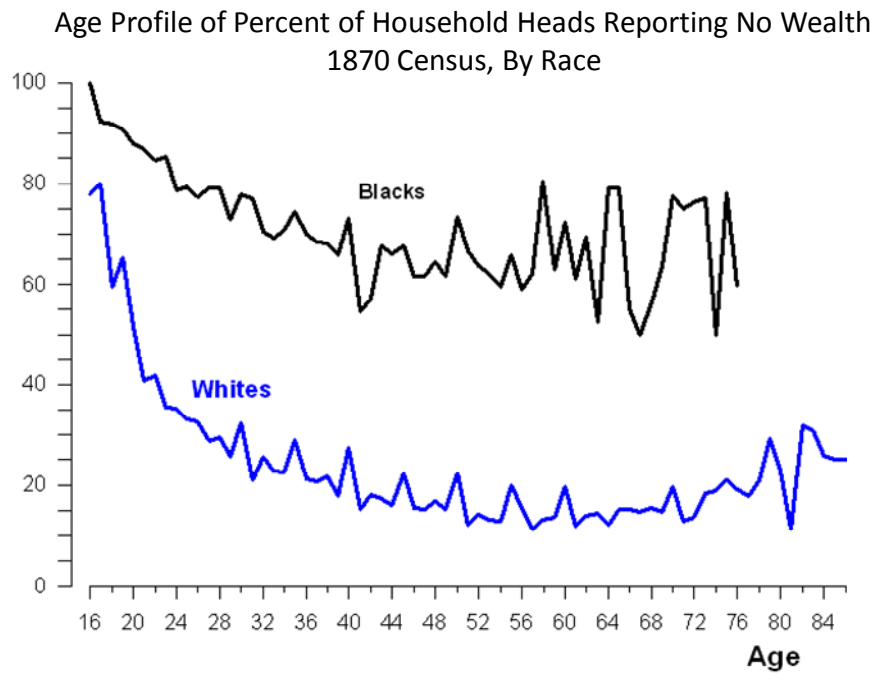


Hard Work, Nonemployment, and the Life Cycle  
Figure 21



Source: Variable *inslife* from Carter, Ransom, Sutch, and Zhao [KS3.1 1993]. Sixth-degree polynomial of a five-year moving average.

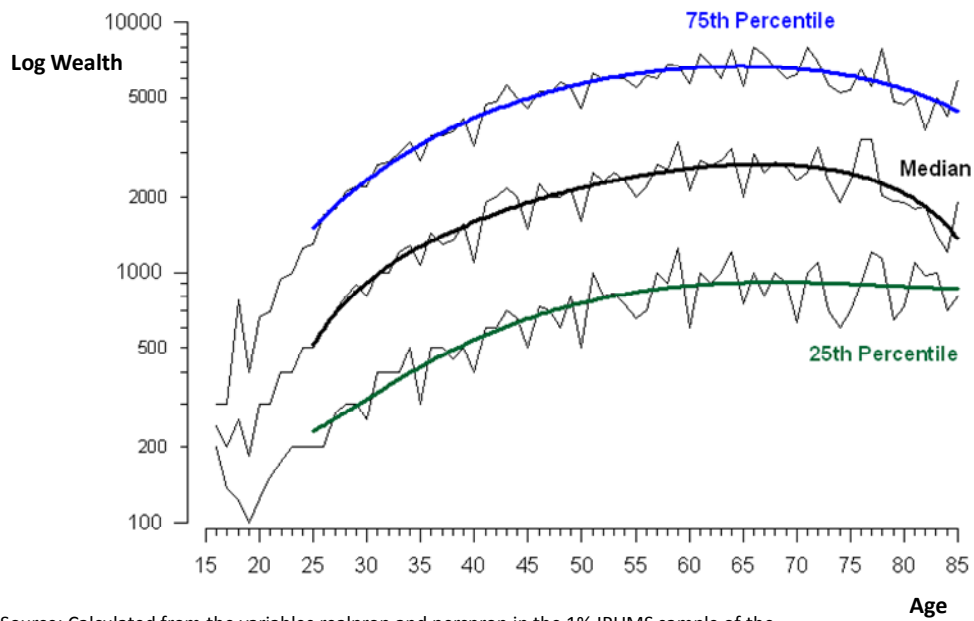
Hard Work, Nonemployment, and the Life Cycle  
Figure 22



Source: Calculated from the variables realprop and persprop in the 1% IPUMS sample of the 1870 Census. N=58,641 whites and 7,747 blacks.

Hard Work, Nonemployment, and the Life Cycle  
Figure 23

Age Profile of Wealth Distribution, White Household Heads, 1870



Source: Calculated from the variables realprop and persprop in the 1% IPUMS sample of the 1870 Census. Forth-degree polynomials fit over the age range 25 to 85. N=47,569.