NBER WORKING PAPER SERIES
ON
HISTORICAL FACTORS IN LONG RUN GROWTH

AGRICULTURAL DECLINE AND THE SECULAR RISE IN MALE RETIREMENT RATES

Dora L. Costa

Historical Paper No. 55

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
April 1994

This paper is based upon a chapter of my 1993 University of Chicago thesis, *Health, Income, and Retirement: Evidence from Nineteenth Century America.* I have benefitted from the comments of Richard Eckhaus, Robert Fogel, Claudia Goldin, Matthew E. Kahn, Robert Margo, Richard Steckel, Peter Temin, and participants in workshops at the University of Michigan and the University of Indiana, and the 1993 Cliometrics Conference. I gratefully acknowledge the support of NIH grant AG1012002 and NSF grant SES9114981. This paper is part of NBER's research program in the Historical Development of the American Economy. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

NBER Historical Paper #55
April 1994

AGRICULTURAL DECLINE AND THE SECULAR RISE IN MALE RETIREMENT RATES

ABSTRACT

Explanations for the decline in labor force participation rates of older men prior to 1950 have focused on the sectoral shift from agriculture to manufacturing. Labor force participation rates of men living in farm households have been consistently higher than those of men living in non-farm households. The decline in the size of the agricultural sector has coincided with the rise in male retirement rates.

Using a new, longitudinal data set I argue that, at the beginning of the twentieth century, men who were farmers were no less likely to retire than men who were not farmers. Past researchers, who examined cross-sectional data, were misled because retired farmers often migrated from their farms. The findings have implications for the secular decline of fertility.

Dora L. Costa
M.I.T.
Department of Economics, E52-262B
50 Memorial Drive
Cambridge, MA 02139
and NBER

1 Agriculture and the Increase in Retirement Rates

One of the major changes in the United States economy during the first half of the twentieth century has been the shift of production from the self-employment and agricultural sectors to the wage and manufacturing sectors. Technological change has been biased toward capital-intensive, large scale production methods in the manufacturing sector and has increased yields per acre in the agricultural sector. The increase in yields per acre has been accompanied by a rise in incomes which has led to relatively slow growth in demand for food and other agricultural products compared with manufactured goods. Thus, the proportion of self-employed men in the labor force has fallen from 27% in 1910 to 21% in 1950 and to 12% in 1980.[1] The fraction of men who are farmers has also fallen. In 1900, 43% of all working men were employed in agriculture. By 1950 the share had fallen to 15% and by 1980 to 3% (Table L-4 in Miller and Brainerd 1957: 609; No. 657 in U.S. Bureau of the Census 1991: 400).[2]

Being a farmer or being self-employed is therefore no longer an option for most workers. Older workers have been especially affected. Self-employment and employment in the agricultural sector allow workers to phase retirement into their lives by reducing hours of work and by switching job assignments. The self-employed often work in a less constrained environment. They are not subject to compulsory retirement nor are they constrained by institutional rules on the length of the work week.[3] They can work at their own pace, instead of that set by the speed of machinery. Self-employment becomes more

[1]Calculated from Preston (1989) and U.S. Bureau of the Census (1983; 1984). The rates are for men at least 30 years of age.

[2]The proportions are for males at least 10 years of age.

[3]Whaples (1990) argues that the declining length of the work week from 1910 to 1920 kept older males in the labor force.

important at older ages. Today self-employed workers stay in the labor force longer and a few older workers enter into self-employment, causing self-employment to rise with age (Fuchs 1982).[4] Carter *et al.* (1992) argue that a similar pattern prevailed in the nineteenth century.

Declines in self-employment at older ages have been especially sharp in the first half of the twentieth century. The fraction of self-employed men 65 years of age or older fell from 79% in 1910 to 38% in 1950, and to 33% in 1980. But, much of the decline in self-employment is attributable to the fall in the size of the agricultural sector. In the non-agricultural sector, the proportion of self-employed men 65 years of age or older was 31% in 1910, fell to 22% in 1950, and rose to 45% in 1980.[5] The fraction of working men 65 years of age or older who are farmers has fallen from 38% in 1910 to 22% in 1950 to 8% in 1980.[6]

The decline in the size of the agricultural sector has coincided with the fall in labor force participation rates among older men. In 1900 about 80% of men 65 years or older were in the labor force, but by 1930 labor force participation rates fell to almost 60%. By 1940 the figure was 44% (Moen 1987).[7] Researchers have therefore argued that

---

[4]Self-employment may rise with age because few older self-employed workers are eligible for pensions.

[5]Self-employment at older ages has increased since 1970.

[6]All rates were calculated from Preston (1989) and U.S. Bureau of the Census (1983a; 1984; 1983b). Own account workers and employers are considered self-employed in 1910 and 1940 and men who are employers of their own corporations are considered self-employed in 1980. The category of farmers does not include agricultural laborers.

[7]In 1940, the definition of the labor force changed. Prior to 1940, only the occupation at which an individual spent most of his time was recorded. It is not possible to distinguish between full-time, part-time, and seasonal workers, and workers with more than one occupation. The current concept of the labor force centers on determining and describing an individual's activity during a specific week. Moen (1987) estimated his series under the pre-1940 definition. Ransom and Sutch (1986) present alternative estimates dating the beginning of the decline to 1940. However, their estimates are based upon the argument that men who reported 6 or more months of unemployment in 1900 were retired. Margo (1993) finds that the long-term unemployed had different characteristics from the retired and hence cannot be classified as

one of the explanations for the decline in male labor force participation rates prior to the establishment of Social Security in 1937 and the expansion of private pension plans after World War II has been the shift of production from the agricultural to the manufacturing sector (Mushkin and Berman 1947; Dorfman 1954; Moen 1987).

Farming is frequently cited as an occupation that provides older workers with great flexibility. It has been thought that farmers remain in the labor force longer because they can continue to operate their farms with the help of family members and of hired labor (e.g. Durand 1948; Taietz, Streib, and Barron 1956; Ransom and Sutch 1986). Studies of farmer retirement from the early 1950s emphasized that the majority of farmers gradually phased work out of their lives, while for non-farmers retirement was an abrupt transition. These studies also found that, in contrast to non-farmers, few farmers had given much thought to retirement (Taeietz, Streib, and Barron 1956; Kain, Baldwin, and Ducoff 1953; Adkins and Motheral 1954; Sewell, Ramsey, and Ducoff 1953).[8]

In fact, labor force participation rates of men living on a farm have been consistently higher than those of men not living on farm. For example, in 1900 labor force participation rates among farm men were 80% and among nonfarm men 63%. In 1950, 62% of farm men were in the labor force, but only 44% of nonfarm men (Moen 1991). High labor force participation rates among farm men are one reason why retirement has traditionally been regarded as an urban phenomenon. International comparisons have emphasized that countries with a larger agricultural sector have higher male labor force participation rates (Pampel and Weiss 1983; Clark and Anker 1990).[9]

---

retired.

[8]Because these studies were carried out before self-employed farm operaters were eligible for Social Security, differences in eligibility for Social Security benefits account for a large fraction of the difference in retirement rates among farmers and non-farmers.

[9]In developing countries, high labor force participation rates among farmers may arise from their greater

The high labor force participation rates of farm men have caused researchers to conclude that the sectoral shift away from agriculture is the most important explanation of the secular decline in labor force participation rates of older men prior to World War II (Durand 1948: 69). Using estimates of participation rates among farm men, Moen (1987: 56) argues that the move away from agriculture accounts for 71% of the decline in labor force participation rates of males at least 65 years of age between 1900 and 1950.

This paper challenges the traditional view of farmer retirement by using a new, longitudinal data set to argue that at the beginning of the twentieth century farmers were no less likely to retire than non-farmers. The findings therefore have implications for explanations of the decline in male labor force participation rates.

2 Farmers and Retirement

A longitudinal data set, hereafter referred to as the Union Army sample, is being collected as part of a project to study the early indicators of later work levels, disease, and death.[10] A random sample of recruits into the Union Army is being linked to their army records, their pension records, and the 1850, 1860, 1900, and 1910 censuses. Collection has not yet been completed and this work is therefore based upon a 6% sample. This research is restricted to non-institutionalized men found in the 1900 census, which provides occupational information.

Searches in the 1900 and 1910 censuses were limited to men found in the pension records because address information is required for linkage and this information is available

---

poverty. But, in the United States, farmers were on average well off.

[10]The project is sponsored by the National Institute of Aging, the National Science Foundation, the National Bureau of Economic Research, the Center for Population Economics at the University of Chicago, and Brigham Young University. Fogel *et al.* 1991 provides a detailed description of the project.

only from the pension records. The pension records also provide death dates, thus avoiding searches for men who died before one of the census years. An analysis of the selection biases arising from linkage failure indicates that the only significant factor in explaining linkage failure is if the recruit was a deserter and hence ineligible for a pension. Life expectancies and the distribution of causes of death were very similar to that of the general population in 1900 (Fogel *et al.* 1991).[11] Among farmers, the proportion of home owners does not differ from that found in the general population.[12]

Occupations of men found in the 1900 and 1910 census were classified as 1) farmers, 2) professionals or proprietors, 3) artisans, and 4) semi-skilled laborers, including farm laborers, on the basis of their 1900 occupation, if in the labor force, or if retired, on the basis of their previous occupation as given in the pension records.[13] A man is considered retired in this analysis if the census enumerator specifically stated that he was retired or had no occupation, or if he left the occupational field empty.[14]

Retirement rates, by occupation, are given in Table 1. Among farmers less than 65 years of age, 6% were retired in 1900 and 33% in 1910. Among non-farmers, 7% were retired in 1900 and 40% in 1910. The difference in the proportion of retirees in either year

---

[11]The sample consists mainly of enlistees from Ohio and New York State, but when I examined a random sample of 4,554 white, non-institutionalized men drawn from the 1900 census (Preston and Higgs 1983), a subsample chosen to have the same geographic distribution as the Union Army sample resembled men in the rest of the country in terms of home ownership, marital status, literacy, occupational distribution, foreign-birth, and age.

[12]The comparison was with Preston and Higgs (1983). Age, nativity, immigration year, and region of residence were controlled for.

[13]The census enumerators were asked to record an individual's primary occupation. In the few cases where two occupations were given, the first occupation was taken. Neither past nor current occupation is known for 51 men out of 696.

[14]In the 1910 census, enumerators rarely left the occupational field empty, but empty occupational fields are common in 1900. The percentage of men with a blank occupational field rises with age. Because occupation is gainful occupation, not occupation held during the enumeration week, an empty field will reflect retirement rather than temporary illness. I use "retired" and "out of the labor force" interchangeably.

Table 1:

PERCENT RETIRED FARMERS AND NON-FARMERS, UNION ARMY SAMPLE

year	age	obs	Farmer	Non-farmer	χ^2	p
1900	< 65	497	5.8%	7.0	0.3	0.58
1900	≥ 65	148	22.7%	15.1%	1.3	0.24
1910	< 65	54	33.3%	16.7%	1.9	0.17
1910	≥ 65	264	34.6%	39.6%	0.7	0.41

among farmers and non-farmers is not statistically significant.[15] [16]

Comparisons of retirement rates, not controlling for sample characteristics, can be misleading in the Union Army sample. Among non-farmers, the Union Army sample contains a smaller proportion of laborers and artisans relative to professionals or proprietors than in the general population. Because professionals and proprietors were less likely to retire than artisans or laborers (Costa 1993) differences in retirement rates between farmers and non-farmers will be attenuated. Furthermore, all men in the Union Army sample received a pension. The value of the pension awarded did not depend upon the wealth of the individual, his ability to earn a living other than by manual means, or his participation in the labor force. Nor did receipt of a pension depend upon whether the disability could be traced to wartime service, but an applicant who could relate his disability to military service received substantially more for the same disability than his counterpart who could

[15]If Ransom and Sutch's (1986) definition of the labor force is used, then among men 65 years of age or older 30% of non-farmers and 29% of farmers were retired in 1900, a statistically insignificant difference. But, among men less than 65 years of age, 19% of non-farmers and 12% of farmers were retired in 1900, a statistically significant difference.

[16]Note that a comparison of the farm and non-farm age distributions of men in the labor force would be deceptive since farmers were on average older. 50% of farmers were aged 50-59, 40% 60-69, and 10% 70 and over. The percentages for non-farmers are 59%, 34%, and 7%, respectively. The two distributions are significantly different at the 10% level with a χ^2 of 4.6.

not.[17] Men with war-related disabilities, and therefore men eligible for a pension, were not randomly chosen. Compared with men whose disabilities were not service related, men who claimed a disability of service related origin were more likely to be farmers and less likely to be professionals or proprietors. Forty-six percent of farmers could trace their disabilities to the war, compared to less than 20% of non-farmers. Men who could trace their disabilities to the war entered the rolls earlier and were rated by the surgeons as being in worse health. Therefore, high retirement rates among farmers could result either from their worse health or their larger pensions.

Table 2 presents the results of a logit where the dependent variable is a dummy equal to one if the veteran was retired.[18] Several proxies for earnings and wealth are used. High state unemployment rates may reflect not only a "discouraged worker" effect, but also low wages.[19] Illiteracy and foreign birth may indicate lower than average earnings.[20] Marital status may also reflect earnings if employers favor married men or if married men are more skilled. In 1900, married males in manufacturing earned 17% more than unmarried males, controlling for the observable characteristics of workers and their jobs (Goldin 1990: 102).[21] Among home owners in cities, letting rooms to boarders may be symptomatic of economic difficulties (Modell and Harevan 1973). However, taking in boarders increases family income, while the hire of a servant is an indicator of affluence.

---

[17]Among 490 men for whom information on whether the disability was war-related is available, 57% could not claim to trace their disabilties were of service origin. Even though old age was not recognized by statute law as sufficient cause to qualify for a pension until 1907, the Pension Bureau instructed the examining surgeons in 1890 to grant a minimum pension to all men who were at least 65 years of age, unless they were unusually vigorous.

[18]The results are discussed in more detail in Costa (1993).

[19]Margo (1993) finds that the long-term unemployed soon retired. The statewide unemployment numbers are from Table A.13 in Keyssar (1986: 340-341).

[20]The foreign-born may have been less skilled than the native-born.

[21]See Korenman and Neumark (1991) for a good analysis of recent data.

Table 2:

LOGIT OF DETERMINANTS OF PROBABILITY RETIREMENT IN 1900, WITH RETIREMENT STATUS AS THE DEPENDENT VARIABLE

526 observations, likelihood ratio=197.28				
variable[a]	mean	est[b]	std err	$\frac{\partial L}{\partial x}$ [c]
dummy=1 if retired	0.17	.		.
intercept	.	$-19.81^{\ddagger}$	4.89	-1.5961
monthly pension	12.94	$0.06^{\ddagger}$	0.02	0.0050
dummy=1 if discharged disability	0.25	$-1.28^{\ddagger}$	0.43	-0.1035
dummy=1 if health good	0.22	.		.
dummy=1 if health fair	0.35	$1.21^{\dagger}$	0.58	0.0957
dummy=1 if health poor	0.25	$1.63^{\ddagger}$	0.59	0.1315
dummy=1 if health status unknown	0.18	0.74	0.62	0.0593
dummy=1 if farmer	0.4	.		.
dummy=1 if professional or proprietor	0.17	-0.52	0.51	-0.0420
dummy=1 if artisan	0.13	0.11	0.50	0.0087
dummy=1 if laborer	0.21	0.13	0.45	0.0106
dummy=1 if occupation unknown	0.09	$4.34^{\ddagger}$	0.60	0.3468
dummy=1 if servant in house	0.02	-1.27	1.40	-0.1023
dummy=1 if boarder in house	0.05	-0.71	0.90	-0.0575
dummy=1 if 4 or more dependents	0.14	-1.30^{*}	0.74	-0.1049
dummy=1 if married	0.85	-0.46	0.39	-0.0372
dummy=1 if foreign-born	0.10	-0.18	0.50	-0.0142
dummy=1 if illiterate	0.06	0.59	0.56	0.0475
dummy=1 if age 50-59	0.50	.		.
dummy=1 if age 60-69	0.37	$0.77^{\dagger}$	0.37	0.0620
dummy=1 if age 70-81	0.13	$1.86^{\ddagger}$	0.47	0.1499
dummy=1 if lives in east	0.21	.		.
dummy=1 if lives in midwest	0.73	0.76	0.53	0.0616
dummy=1 if lives in other region	0.06	-0.63	1.03	-0.0511
dummy=1 if urban county	0.37	$0.89^{\ddagger}$	0.35	0.0720
mean duration of unemployment for manufacturing workers by state	3.62	$4.11^{\ddagger}$	1.33	0.2958

[a]The omitted dummies are good health, farmer, age 50-59, and eastern residence.

[b]The symbols $*$, †, and ‡ indicate that the coefficient is significantly different from 0 at at least the 10%, 5%, and 1% level, respectively.

[c] $\frac{\partial L}{\partial x} = \beta \frac{1}{n} \sum L(1-L)$ and is in probability units.

Because receipt of a pension or pension increase was contingent upon the results of a physical examination by a board of three examining surgeons employed by the Pension Bureau and following guidelines established by the Bureau, detailed health records were generated by the Union Army Pension Program.[22] The surgeons rated each specific disability and I added the ratings to construct health dummies.[23] An additional health variable that is used is whether the veteran was discharged from the service for disability.

Table 2 shows that when sample characteristics are controlled for, farmers were still no less likely to retire than professionals or proprietors, artisans, or laborers.[24] When men whose occupation was unknown were assigned an occupational class based upon their occupation at enlistment, farmers were significantly more likely to be retired than professionals or proprietors.[25]

Although farmers were rated in worse health than non-farmers, farmer retirement rates do not appear to be reflecting unmeasured health effects. The results persist when different health proxies and health indices based upon different weighting schemes are used. When home and farm ownership is controlled for, farmers become more likely to retire than non-farmers, suggesting either that farm ownership indicates active labor force participation

---

[22]Among all men on the rolls in 1910, about 7.5 exams are available per veteran.

[23]A detailed description of the construction of the health dummies is provided in Costa (1993). Characteristics unrelated to health do not predict the surgeons' ratings, suggesting that using the ratings of the examining surgeons as a health measure will not bias my results.

[24]Note that although retirement probabilities among farmers and professionals or proprietors do not differ significantly, the point estimate suggests that farmers were more likely to retire compared to professionals or proprietors.

[25]The sample was initially restricted to men who were in the labor force and their probability of switching occupation between enlistment and 1900 predicted on the basis of their individual characteristics. Men with missing occupational information more likely to remain in the same occupational group than to change were assigned to their enlistment occupational category. Men likely to have switched were assigned to the 1900 occupational category that they were more likely to have entered.

or that farmer retirement rates arise from farmers' greater wealth.[26] High retirement rates among farmers were not the result of the great physical exertion required by farming. When health is interacted with farm occupation, the coefficient on the resulting variable is not significant.[27]

Linking a random sample of non-veterans drawn from the Public Use Sample of the 1910 census (Preston 1983) to the 1900 census allows us to test if high retirement rates are found in the Union Army sample alone. To ensure compatibility with the Union Army sample, the sample of non-veterans was restricted to white men who were at least 62 years of age in 1910 and who were either born in a Union state or who immigrated prior to the war. Note that the method employed to link non-veterans across census years is different from that employed in linking Union Army veterans and will yield biases. Linkage to the 1900 census required knowledge of state of residence. For Union Army veterans, state of residence is known from their pension records. However, for non-veterans only state of residence in 1910 is known and searches in the 1900 census were limited to state of residence in 1910. If retirement is accompanied by a move, then the omission of movers from the sample will yield spuriously low retirement rates among non-veterans compared to veterans. If retirees tend to remain in the same state then the loss of movers biases non-veteran relative to veteran retirement rates upwards. In fact, when men who moved across state lines are omitted from the Union Army sample, retirement rates among men 65 years of age or older rise by at least 10 percentage points, suggesting that the loss of movers will greatly overestimate retirement rates.[28] But, the difference in retirement rates between

[26]The relationship between farmer retirement and wealth will be discussed later.

[27]Note that men who were discharged for disability were significantly more likely to in the labor than men who had not been discharged for disability. One possible explanation is that men who had been discharged for disability switched to a less physically demanding job. I find evidence of this (Costa 1993).

[28]The retirement rate for farmers rises from 35 to 46% and for non-farmers from 40 to 54%.

Table 3:

PERCENT RETIRED FARMERS AND NON-FARMERS, NON-VETERANS

year	age	obs	Farmer	Non-farmer	χ^2	p
1910	≥ 65	256	40.8%	34.6%	1.1	0.30

Note: As discussed in the text, retirement rates cannot be compared with those in the Union Army sample.

farmers and non-farmers still remains insignificant indicating that the loss of movers will not severely skew inter-group comparisons.

Table 3 shows that even among non-veterans, retirement rates among farmers and non-farmers are not significantly different. In 1910, 41% of farmers aged 65 or older were retired and 35% of non-farmers were retired.[29] These results suggest that the insignificant differences in retirement rates among farmers and non-farmers are not the result of peculiarities in the Union Army sample.

3 Explaining the High Retirement Rates of Farmers

The evidence strongly suggests that farmers and non-farmers retire at the same rate. If so, then why have past researchers assumed that farmers are less likely to retire than non-farmers? Durand (1948: 68-69) first noted that the higher rates of labor force attachment among farm men may be an artifact of the way in which the rural farm population is defined. Because farmers who withdrew from the labor force often moved into a non-farm residence or ceased to cultivate their land, they were eliminated from the rural farm

[29]Controlling for sample characteristics, farmers were still no less likely to retire than non-farmers in both the veteran and non-veteran samples.

Table 4:

PERCENT RETIRED BY FARM RESIDENCE AND FARM OCCUPATION, UNION ARMY SAMPLE

			Residence				Occupation			
				Non-				Non-		
year	age	obs	Farm	farm	χ^2	p	Farm	farm	χ^2	p
1900	< 65	497	0%	9.9%	20.0	0.00	5.8%	7.0	0.3	0.58
1900	≥ 65	148	8.3%	28.6%	9.7	0.00	22.7%	15.1%	1.3	0.24
1910	< 65	54	7.7%	27.5%	2.2	0.14	33.3%	16.7%	1.9	0.17
1910	≥ 65	264	20.4%	47.1%	17.7	0.00	34.6%	39.6%	0.7	0.41

population. Thus the only older men who remained in the rural farm population were employed as farmers. However, he did not believe that farmer withdrawal from a farm residence and into a non-farm residence could lead to retirement rates among farmers as high as those of non-farmers. Dorfman (1954) also noted that there was a substantial tendency for older people to migrate away from the farm upon leaving the labor force, but added that migration was unlikely to be the entire explanation of the high rate of labor force participation in rural farm communities. These researchers were not able to examine past occupation and compared the labor force rate of men who lived on a farm with that of men who did not. That can be misleading. When retirement rates in Union Army sample and non-veteran sample are compared by residence, not occupation, the percentage of retired men in the farm sector is considerably smaller and it seems as if farmers are indeed less likely to withdraw from the labor force than non-farmers (see Table 4 and Table 5).

Retired farmers in the 1900 census would not be classified as part of the farm sector since most were no longer living on a farm. Among the 31 retired farmers in the sample 84% were no longer living on a farm. Fifty men who were farmers in 1900 and who had retired by 1910 were linked to the 1910 census. Sixty-nine percent were living

Table 5:

PERCENT NON-VETERANS RETIRED BY FARM RESIDENCE AND FARM OCCUPATION

			Residence				Occupation			
				Non-				Non-		
year	age	obs	Farm	farm	χ^2	p	Farm	farm	χ^2	p
1910	≥ 65	256	28.3%	43.3%	5.9	0.02	40.8%	34.6%	1.1	0.30

in a house in 1910, 59% had moved to a different town, 21% to a different county, and 14% to a different state. Moves across state lines averaged 1128 miles and those across county lines, but within a state, 56 miles. This pattern of farmer retirement accompanied by moves, frequently to a nearby town, has been noted before (Salamon 1992; Bogue 1971; Bauder and Doerflinger 1967; Sauer, Bauder, and Biggar 1964; Haber and Gratton 1993). Movement off of the farm for a given cohort can also be seen in the 1900 and 1910 censuses. As Table 6 shows, the percentage of the rural population living on a farm declines sharply between ages 50-79.

For the majority of farmers withdrawal from the labor force upon the cessation of farming was permanent. Few farmers entered another occupation. Among the men who were farmers in 1900, only 21% had changed occupations by 1910 in contrast to 51% of artisans and 45% of laborers.[30]

If farmers were wealthier than non-farmers, then they may have had less need to remain in the labor force.[31] In 1900, 89% of active farmers owned their own farms and

[30]The relatively low rate of occupational change of farmers relative to artisans and laborers is significant even controlling for other characteristics.

[31]Unfortunately, it is not possible to obtain information on farmers' wealth. The 1900 schedules of the Census of Agriculture were lost. Linkage rates to earlier schedules have proved to be too low to obtain a viable sample.

Table 6:

PERCENTAGE OF WHITE NOTHERN RURAL POPULATION LIVING ON A FARM BY AGE GROUP, 1900-1910, RANDOM SAMPLE

cohort age in 1900	% living on farm obs	1900	obs	1910
40-49	62.2	1666	60.0	3820
50-59	63.8	909	53.5	2275
60-69	62.5	614	52.2	1165
70-79	55.7	273	54.6	302

Note: The sample was restricted to all men who were either born in a Union state, or who, if foreign-born, immigrated prior to 1861. Rural areas are defined as localities with populations of 2500 or less. Source: 1900 and 1910 Public Use Census Samples (Preston and Higgs 1983; Preston 1989).

in 1900 93%.[32] But, when farmers who left their farms are compared with non-farmers in either 1900 or 1910, the extent of home ownership is not significantly different.[33] Thus, farmers were either no wealthier than non-farmers, or they held their wealth in a form other than home ownership. Bogue (1971) finds that when farmers left the land to retire to county towns, they accepted mortages for a portion of the sale price of their land. Moen (1991) finds that in 1860 older men who lived in rural non-farm households held considerable amounts of real estate wealth and suggests that is because retired farmers still possessed farm land. Parsons and Waples (1945) examined a low tenancy area of

[32]Farm ownership in 1900 does not predict retirement in 1910.

[33]Among men who were farmers in 1900 and had retired by 1910, 74% of the farmers owned their homes in 1910, compared with 76% of non-farmers. Among retirees in 1900, 80% of the non-farmers owned their homes, compared to 74% of farmers. While significantly more of the farmers owned their homes free of mortages in 1900, there differences in 1910 are insignificant.

Wisconsin and found that a frequently employed method for retaining the farm in the family was for parents aged 55-65 to transfer the farm to a son of about 27 years of age. The transfer might be accompanied by a mortage which gave the parents an income and was automatically cancelled upon their deaths. The parents might live in town on the interest from the mortage, or the children might care for the parents on the farm, without any kind of formal agreement.[34]

Deed and probate records provide direct evidence on farmer wealth. But, success in linking the farmers who retired between 1900 and 1910 to their probate records and their deed records between 1900 and 1910 has been mixed. Only the deed records for 20 men out of 55 searched have been found. The deeds that were found recorded both sales and purchases. Ten men frequently bought land from and sold land to non-relatives, and three of these only purchased and never sold land. Seven men transferred land to their children for a nominal sum, one for a discounted price, and one as an outright gift. The remaining man purchased land from his wife for a nominal sum. None of the sales were of the entire farm property, suggesting that outright sales were rare. Only 9 of the men have been linked to probate records, and these men held substantial amounts of wealth until their death.

Consistent with the evidence on farmers' moving away from the farm upon retirement, there is no evidence that land was exchanged for childrens' care. The men who transferred land to children rarely lived in their childrens' homes. (In fact, in rural, northern areas with populations of 2500 or less, 78% of all men aged 65 years of age or older were

[34]But, a study of Iowa farm inheritance from 1870 to 1945 finds that only slightly over half of all tracts remained in family hands for two generations or more (Friedberger 1984). Salamon (1992) identifies two types of succession patterns in Illinois. One pattern, prevalent among ethnic Germans, was for a farmer to retire around age 55 when a son was ready to succede. The other pattern, prevalent among ethnic Yankees, was for retirement to occur when the father was ready, seldom before age 65.

heads of households in 1910.[35]) Only one of the seven men who transferred land to children lived with his daughter and her family and he moved out upon remarriage. The average distance of within county moves suggests that contact between children who received land and parents was limited. Furthermore, neither the total number of children, as listed in the pension records, nor the number of children in the household, predicts retirement (Costa 1993).

In 1900 and 1910 farmer retirement may have been enhanced by the unusually high appreciation of real estate, livestock, and other farm property that occurred during the years 1895-1915.[36] Parsons (1986) finds that from 1930-1950 the labor force participation of the aged within the agricultural sector was significantly lower in wealthy farm states than in poorer farm states. Similarly, in 1910, labor force participation rates of older men were significantly lower in wealthy farm counties.[37] But, the impact of farm wealth on labor force participation rates is small. A $10,000 increase in the average value of a farm in 1910 would increase the average county retirement rate of 0.60 by only 0.07.[38]

Evidence corroborating high retirement rates among farmers in other time periods is provided by Moen's (1991) estimates of labor force participation rates among men 65 years of age classified according to farm residence, rural non-farm residence, and urban residence. From 1860 to 1980 labor force participation rates among farm men were much higher than labor force participation rates among rural non-farm men and among urban men. But, labor force participation rates were lower among rural non-farm men than among

---

[35]Most of these men were indeed household heads. It is very rare to observe adult, working children in the household.

[36]Wages of farm laborers relative to industrial workers rose 17% (Schultz 1945).

[37]County labor force participation rates were calculated from the 1910 Public Use Sample (Preston 1989) and linked to county-level information on the farm sector.

[38]Estimated from Preston (1989) and ICPSR).

urban men, suggesting that the rural non-farm population contained retired farmers.[39]

The question that still remains unanswered is why farmers and non-farmers were retiring at the same rate. Why didn't older farmers continue to operate the family farm with the help of either family members or hired labor? Wealth held in the form of mortages or rental payments may have provided farmers with the means to retire. The decline of agriculture may have been the spur. From 1900 to 1910, the fraction of the male labor force employed in agriculture fell by 18%. In the northern states that comprise the Union Army sample, the proportion declined by 28% (Table L-4 in Miller and Brainerd 1957).[40] For older farmers, with few skills outside of the farm sector, retirement may have been a better option than re-employment in the manufacturing sector.[41]

If a declining agricultural sector or rising wealth led to both decreases in the fraction of the population working as farmers and increases in retirement rates among farmers as more of them chose early retirement, then the net effect on retirement rates is ambiguous. For example, the retirement rate at time t, R_t, can be written as

$$R_t = FF_t R_{F,t} + FNF_t R_{NF,t}\,,$$

where FF_t is the fraction of farmers in the labor force, FNF_t the fraction of non-farmers,

[39]While this evidence is suggestive, it cannot confirm whether farmers retired at the same rate as non-farmers. Work is currently in progress to link men across the 1860 and 1870 censuses and the 1910 and 1920 censuses.

[40]In the entire country the percentage of working men 65 years of age or older fell by 13% between 1900 and 1910.

[41]A similar phenomenon occurred in France from 1959 to 1970. Within agriculture, the self-employed chose retirement far more frequently than they chose to take a new job (Adams 1989). Linkage from the 1860 to the 1870 census will confirm whether farmers were as likely to retire as non-farmers at a time when agriculture was not declining.

$R_{F,t}$ the retirement rate of farmers, and $R_{NF,t}$ the retirement rate of non-farmers. Assuming that retirement rates of non-farmers do not change over time, the difference in retirement rates between period 2 and period 1 can be written as,

$$R_2 - R_1 = \Delta FF_1(R_{F,1} - R_{NF}) + (\Delta FF_1 + FF_1)\Delta R_{F,1}\,,$$

where ΔFF_1 is the decrease in the fraction of the population employed as farmers from period 1 to period 2 and $\Delta R_{F,1}$ is the increase in retirement rates among farmers from period 1 to period 2. Thus, when retirement rates of farmers are equal to those of non-farmers and do not change across time periods, retirement rates will be constant. When retirement rates of farmers are equal to those of non-farmers and increase over time, retirement rates will increase. When retirement rates of farmers are less than those of non-farmers retirement rates will increase. But, when retirement rates of farmers are greater than those of non-farmers the results are ambiguous.

From 1900 to 1910, retirement rates for farmers 65 years of age or older rose. Thus, declines in farming that led to early retirement would have increased aggregate retirement rates. Whether a similar pattern could have prevailed in other time periods cannot yet be ascertained.[42]

[42]Once again linkage between the 1860 and 1870 censuses and the 1910 and 1920 censuses will shed some light on this question. Note, however, that Moen (1991) finds that retirement rates among rural, non-farm men were rising over time.

4 Implications of the Findings

This paper has shown that retirement rates among farmers and non-farmers did not differ in 1900 and in 1910. Because previous researchers examined retirement rates by farm dwelling and not by farm occupation, they ignored the farmers who had retired off of the farm and mistakenly concluded that farmers were less likely to withdraw from the labor force than non-farmers. Although farmers may have been retiring at a high rate between 1895-1915 because of unusually high rates of appreciation of farm land, evidence from later periods suggests that the percentage of retired farmers living off of the farm was always very high. Retirement rates among farmers comparable to those among non-farmers may have arisen from farmers' high wealth holdings or from declines in agriculture which induced early retirement. Therefore, the sectoral shift away from agriculture could have contributed to falling labor force participation rates among the elderly only by increasing farmer retirement rates. Although farmer retirement appears to have been rising, the available data cannot attribute rising farmer retirement rates to the decline of agriculture. Explanations for the secular rise in male retirement rates prior to 1940 may therefore have to focus on other factors, such as increases in income or changes in the elasticity of labor force non-participation with respect to income (Costa 1993).

The findings have implications not only for explanations of male labor force participation rates, but also for explanations of the secular decline in fertility rates. If mortages or other financial instruments had developed to the point where they could provide a reliable means of saving, then the desirability of financial instruments as retirement assets relative to children may risen, leading fertility to fall. In fact, fertility declined steadily from 1830 to 1890. Between 1830 and 1839 the fertility rate stood at 6.6, between 1860-1869 at 4.8, and between 1880-1889 at 3.7 (Bourne 1985: 17). Perhaps part of the nineteenth century

decline in fertility can therefore be attributed to changes in the value of children as old-age security assets caused by the development of financial markets. Steckel (1990) finds an inverse correlation between fertility and the number of banks per capita in the antebellum United States. Real estate wealth may have also served as a financial instrument. Costa (1993) finds that among ante-bellum farmers the number of births and increases in real estate wealth were inversely related.

Researchers have argued that in many lesser developed countries financial assets are inadequate for old age provision (Robinson and Horlacher 1971). The findings of this paper suggest that as financial markets evolve in developing countries, fertility may fall and the strong preference for sons (Rosenzweig and Schultz 1982) arising from sons' roles as the primary care-takers of their aging parents may disappear. Furthermore, if high labor force participation rates in the agricultural sector reflect mainly the availability of savings instruments for old age, then retirement rates will rise.

References

[1] Adams, William James. 1989. *Restructuring the French Economy: Government and the Rise of Market Competition since World War II.* Washington, DC: The Brookings Institute.

[2] Adkins, William G. and Joe R. Motheral. 1954. The Farmer Looks at His Economic Security. *Texas Agricultural Experiment Station Bulletin.* No. 774.

[3] Atack, Jeremy and Fred Bateman. 1987. *To Their Own Soil: Agriculture in the Antebellum North.* Ames, IA: University of Iowa State Press.

[4] Alter, George, Goldin, Claudia, and Elyce Rotella. The Savings of Ordinary Americans: The Philadelphia Saving Fund in the Mid-Nineteenth Century. *NBER Working Paper No. 4126*

[5] Bauder, Ward W. and Jon A. Doerflinger. 1967. Work Roles Among the Rural Aged. In Youmans, E.G. (Ed.), *Older Rural Americans.* Lexington, KY: University of Kentucky Press: 22-43.

[6] Blau, David M. 1987. A Time-Series Analysis of Self-Employment in the United States. *Journal of Political Economy.* 95: 445-467.

[7] Bogue, Allan G. 1963. From Prarie to Cornbelt: Farming on the Illinois and Iowa Prairie in the Nineteenth Century. Chicago: University of Chicago Press.

[8] Bogue, Allan G. 1971. Financing the Prarie Farmer. In *The Re-interpretation of American Economic History.* Eds., Fogel, R.W. and S.L. Engerman.

[9] Clark, Robert L. and Richard Anker. 1990. Labour force participation rates of older persons: An international comparison. *International Labour Review.* 129: 255-271.

[10] Costa, Dora L. 1993. *Health, Income, and Retirement: Evidence from Nineteenth Century America.* Unpublished Phd. Dissertation. University of Chicago.

[11] Dorfman, Robert. 1954. The Labor Force Status of Persons Aged Sixty-five and Over. *The American Economic Review, Papers and Proceedings.* 44: 634-644.

[12] Durand, John D. 1948. *The Labor Force in the United States, 1890-1960.* New York: Social Science Research Council.

[13] Fogel, Robert W., Michael Haines, Clayne L. Pope, Irwin H. Rosenberg, Nevin S. Scrimshaw, James Trussell, Larry T. Wimmer. 1991. Early Indicators of Later Work Levels, Disease, and Death. Grant Proposal Submitted to N.I.H.

[14] Friedberger, Mark W. 1984. Handing Down the Home Place: Farm Inheritance Strategies in Iowa, 1870-1945. *Annals of Iowa.* 47: 518-536.

[15] Goldin, Claudia. 1990. *Understanding the Gender Gap: An Economic History of American Women.* Oxford: Oxford University Press.

[16] Gordon, Roger H. and Alan S. Blinder. 1980. Market Wages, Reservation Wages and Retirement Decisions. *Journal of Public Economics.* 14: 277-308.

[17] Haber, Carole and Brian Gratton. 1993. *Old Age and the Search for Security: an American Social History.* Bloomington, IN: Indiana University Press.

[18] ICPSR (Inter-university Consortium for Political and Social Research). *Historical, Demographic, and Social Data: The United States, 1790-1970.* Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

[19] Keyssar, Alexander. 1986. *Out of Work: The First Century of Unemployment in Massachusetts.* New York: Cambridge University Press.

[20] Korenman, Sanders and David Neumark. 1991. Does Marriage Really Make Men More Productive? *Journal of Human Resources.* 26: 282-307

[21] Margo, Robert A. 1993. The Labor Force Participation of Older Americans in 1900: Further Results. *Explorations in Economic History.* Forthcoming.

[22] McKain, Walter C. Jr., Elmer D. Baldwin, and Louis J. Ducoff. 1953. Old Age and Retirement in Rural Conneticut: 2. Economic Security of Farm Operators and Farm Laborers. *Storrs Agricultural Experiment Station Bulletin.* No. 299.

[23] Miller, Ann Ratner and Carol P. Brainerd. 1957. Labor Force Estimates. In *Population Redistribution and Economic Growth United States, 1870-1950: Methodological Considerations and Reference Tables.* By Lee, E., Miller A.E., Brainerd, C.P., and Easterlin, R.A. Philadelphia: The American Philosophical Society.

[24] Modell J. and Tamara K. Hareven. 1973. Urbanization and the Malleable Household: Boarding and Lodging in American Families. *Journal of Marriage and the Family.* 1: 7-32.

[25] Moen, Jon Roger. 1987. *Essays on the Labor Force and Labor Force Participation Rates: The United States From 1860 Through 1950.* Unpublished PhD Dissertation. The University of Chicago.

[26] Moen, Jon Roger. 1991. Rural, Non-farm Households: A New View on the Labor Force Participation Rate of Men 65 and Older, 1860-1980. Unpublished manuscript. University of Mississippi.

[27] Mushkin, S.J. and Berman, Alan. 1947. Factors Influencing Trends in Employment of the Aged. *Social Security Bulletin.* 10: 18-23.

[28] Pampel, F.C. and Weiss, J.A. 1983. Economic Development, pension policies, and labor force participation of aged males: A cross-national, longitudinal approach. *American Journal of Sociology.*

[29] Parsons, Donald O. 1986. Male Retirement Behavior in the United States, 1930-1950. *Journal of Economic History.* 51: 657-674.

[30] Parsons, Kenneth H. and Eliot O. Waples. 1945. Keeping the Farm in the Family: A Study of Ownership Processes in a Low Tenancy Area of Eastern Wisconsin. *Wisconsin Agricultural Experiment Station. Research Bulletin.* No. 157.

[31] Preston, Samuel H. 1989. *Census of Population, 1910 [United States]: Public Use Sample. ICPSR 9166.* Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

[32] Preston, Samuel H. and Higgs. 1983. *United States Census Data, 1900: Public Use Sample (ICPSR 7825).* Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

[33] Preston, Samuel H., Nathan Keyfitz,and Robert Schoen. 1972. *Causes of Death: Life Tables for National Populations.* New York: Seminar Press.

[34] 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: 1-30.

[35] Robinson, W.D. and D.E. Horlacher. 1971. Population Growth and Economic Welfare. *Reports on Population/Family Planning.* no. 6 (1971).

[36] Rosenzweig, Mark R. and T. Paul Schultz. 1982. Market Opportunities, Genetic Endowments, and Intrafamily Resouce Distribution: Child Survival in Rural India. *American Economic Review.* 72: 803-815.

[37] Salamon, Sonya. 1992. *Prairie Patrimony: Family, Farming, and Community in the Midwest.* Chapel Hill, NC: University of North Carolina Press.

[38] Sauer, Howard M., Ward W. Bauder, and Jeanne C. Biggar. 1964. Retirement Plans, Concepts and Attitudes of Farm Operators in Three Eastern South Dakota Counties. *Bulletin.* No. 515. U.S. Department of Agriculture.

[39] Sewell, William H., Charles E. Ramsey, and Louis J. Ducoff. 1953. Farmers' Conceptions and Plans for Economic Security in Old Age. *Wisconsin Agricultural Experment Station Bulletin.* No. 182.

[40] Schultz, T.W. 1945. *Agriculture in Unstable Economy.* New York: McGraw-Hill Book Company.

[41] Steckel, Richard H. 1992. The Fertility Transition in the United States: Tests of Alternative Hypotheses. In *Strategic Factors in Nineteenth Century American Economic History.* Eds. Goldin, C. and Rockoff, H. Chicago: University of Chicago Press: 351-374.

[42] Taietz, Philip, Gordon F. Streib, and Milton L. Barron. 1956. Adjustment to Retirement in Rural New York State. *Cornell Experiment Station Bulletin.* No. 919.

[43] U.S. Bureau of the Census. 1854. *Report on the Population of the United States at the Seventh Census.* Washington, DC: Government Printing Office.

[44] U.S. Bureau of the Census. 1864. *Report on the Population of the United States a the Eighth Census.* Washington, DC: Government Printing Office.

[45] U.S. Bureau of the Census. 1983. *Census of Population and Housing, 1980 (United States): Public Use Microdata Samples. ICPSR 8101.* Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

[46] U.S. Bureau of the Census. 1984. *Census of Population, 1950 [United States]: Public Use Microdata Sample. ICPSR 8251.* Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

[47] U.S. Bureau of the Census. 1991. *Statistical Abstract of the United States: 1991.* Washington, DC: Government Printing Office.

[48] Weiss, Thomas. 1991. U.S. Labor Force Estimates and Economic Growth 1800 to 1860. Unpublished manuscript. University of Kansas.

[49] Whaples, Robert. 1990. *The Shortening of the American Work Week: An Economic and Historical Analysis of its Context, Causes, and Consequences.* Unpublished Phd. Dissertation. University of Pennsylvania.