

The Performance of Life Insurance Companies: 1860-1905

The Role of Insurance Companies as Financial Intermediaries in Capital Formation and Social Savings

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This paper will focus on the performance of Tontine Life insurance since it was the most widely popularized form of insurance in the late nineteenth century United States. It featured the standard mutual life insurance policy combined with a savings and investment feature. During the life of the policy annual dividends were deferred and re-invested by the insurance company. At the end of the policy these dividends were significant potentially influencing precautionary savings during the late-nineteenth century. The features of life insurance as a liquid asset which could be converted into cash or dollar amounts made it an attractive choice for the emerging middle class for savings. The growth of precautionary savings led to the tremendous growth of the industry. Most studies so far that have focused on life-cycle or precautionary savings have generally focused on savings banks rather than on other institutions. By creating more attractive policies for policyholders the industry grew at an increasing rate despite several sharp economic downturns. Their capital accumulations, reserves, and income had a profound effect on the American economy. This paper compiles data from Spectator Insurance Yearbooks from 1880-1905 to examine the performance and rates of returns to policyholders. These yearbooks provide a summary of legal changes as well as marketing literature that give us a picture of the institution and the role it played in US society.

American economic activity in post Civil War America displayed tremendous growth and social upheaval. Life insurance companies mirrored the same type of volatility as major industries in the United States. In the antebellum period, life insurance was composed of a group of ad-hoc companies centered on the Northeastern United States. These companies were generally located in the Baltimore and Philadelphia areas. Early laws governing the behavior of life insurance companies required that they maintained high reserve levels to insure policyholders [Murphy 2005:223] Early insurance incorporation laws required these high reserves as a way to ensure financial stability [Murphy 2005: 203].

It wasn't until legal changes spearheaded by insurance companies in Pennsylvania and New York in the 1860s changed the way insurance companies could be formed. Due to the high requirements for reserve levels insurance companies often had to sell stock and shares of the companies in order to raise the cash necessary to back up the values of their insurance policies. To give these shareholders an incentive to invest, insurance policies had to be sold at a cost sufficient to make the company highly profitable. By lowering the reserve requirements, life insurance companies not only allowed more life insurance companies enter the market, but for the insurance companies could be structured differently. The Panic of 1819 affected the industry negatively as states sought to restrict insurance companies and their policies. Insurance companies along with banks had overleveraged themselves and quickly became insolvent as people began to default on their policies and remove their deposits. Many states, New York in particular, sought to prevent fraud and abuse from what they viewed as a risky business. Chartering new insurance companies became extremely difficult, since the startup costs were prohibitively high. Companies had to use stock and shares to raise the capital necessary to maintain the high reserve requirements for business. Few insurance companies would be

incorporated as shared stockholder companies because of the stringent regulations enacted after the Panic of 1819. However, mutual insurance which had lower capital reserve requirements, thus negating the need for high capital accumulation, began to expand. This form of insurance proved highly popular with those buying insurance since policyholders had added benefits when compared to non-mutual insurance.

Mutual insurance operated by providing dividend payments to policyholders. Previously the only benefit policyholders purchased was the value of the policy. Under mutual insurance, individuals would receive dividend payments, because in theory, the policyholder was a stakeholder in the company [Murphy 2005: 180]. Under the previous insurance regimes, policyholders could only receive a death benefit, in part because of the higher reserve requirements before 1840. Since the old insurance companies had to hold much more money for a reserve, they could not provide a dividend for policyholders. The shareholders, who had raised the capital to start the insurance company, would receive payouts, but not policyholders. This often limited the attractiveness of insurance to individuals in the upper echelon of society. In the Antebellum period life insurance was purchased mostly for individuals who were either college students or travelers.

Most early colleges were private institutions and required a fair amount of monetary investment from the family to send their son to college. Insuring the life of a son away at college was critical. Typically, young men are at higher risk for death or injury, particularly away at college. The enormous amount of money invested in the son's education required insurance against this risk [Stalson 1942: 107]. Another common category of policyholders were travelers. During the ante-bellum period, travel in the United States was haphazard. Crossing vast geographic regions took days, weeks, and even months, particularly if they were trying to get

goods to market. This required some insurance against the loss of goods or life while traveling. This left life insurance as a specialized financial service that only catered to the upper strata of society. Insurance policies became much more prolific after the advent of mutual insurance. Not only was the dividend feature attractive, but the increasing number of companies forced down premiums and made insurance available to a wider segment of society. Mutual insurance companies are easily formed since they used annual premiums to cover life insurance policy losses during the course of the year [Stalson 1942: 110]. If a sufficient number of policies could be sold the annual premiums would be able to cover potential losses in any given year, allowing the company to hold a reserve that could be invested with the returns from those invested distributed to policyholders annually. The intuition for organizing a company along mutual lines was that it did not require the level of capital that older companies needed to insure each policy. Legal changes in most states required joint-stock insurance companies to have higher reserve requirements than mutuals [Murphy 2005:207]. Mutual companies argued that if they could reasonably calculate deaths and payouts per year they could manage payouts to policyholders without the need of larger reserves. The reserves would be drawn from the annual premiums which when priced, would incorporate the required reserved amount by law, typically at three percent of the value of the policy.

Life insurance companies felt that it was highly unlikely that a sufficient number of individuals would die in one year to make the insurance company insolvent, as long as policies were sold to the right individuals. If they developed effective sorting mechanisms they could limit risks to the company. Life insurance agents became critically important since the company would rely on them to evaluate the risk of insuring an individual. This however, did not insulate the companies from the problems of the economy. The Panic of 1873 in particular would force

many companies out of business as deteriorating financial conditions created solvency problems for many of the smaller life insurance companies.

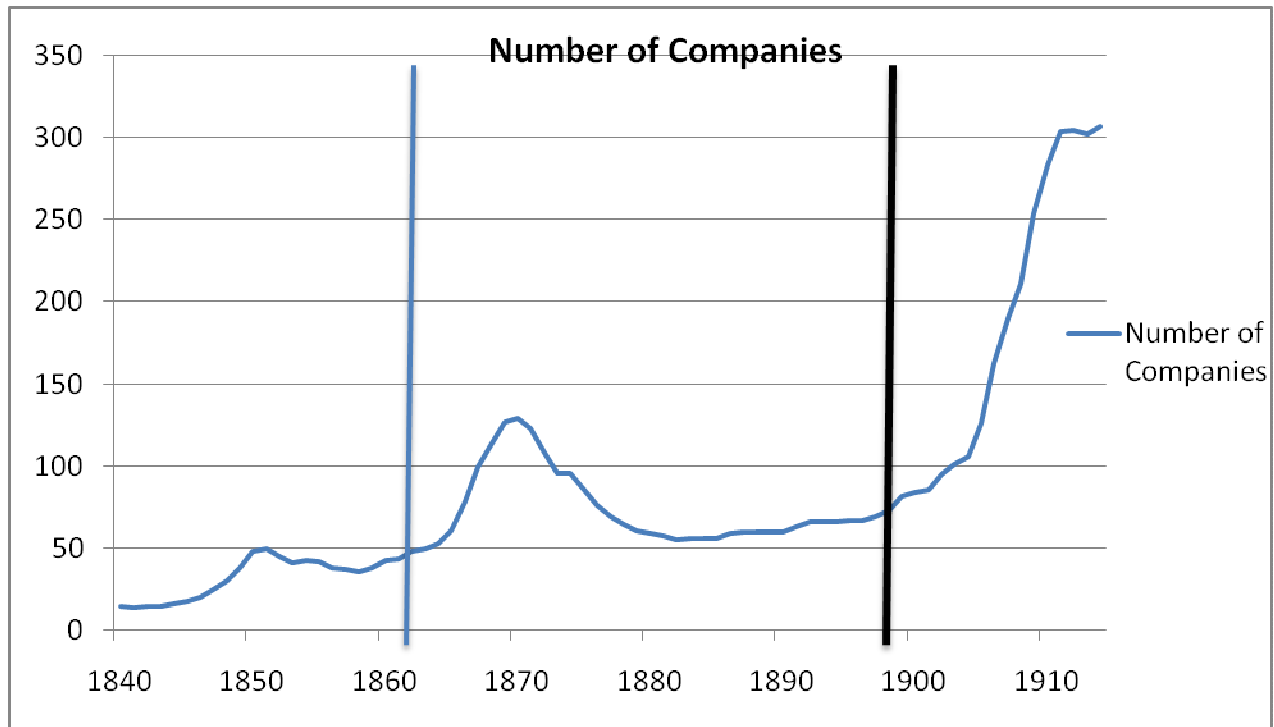


Figure 1.1¹

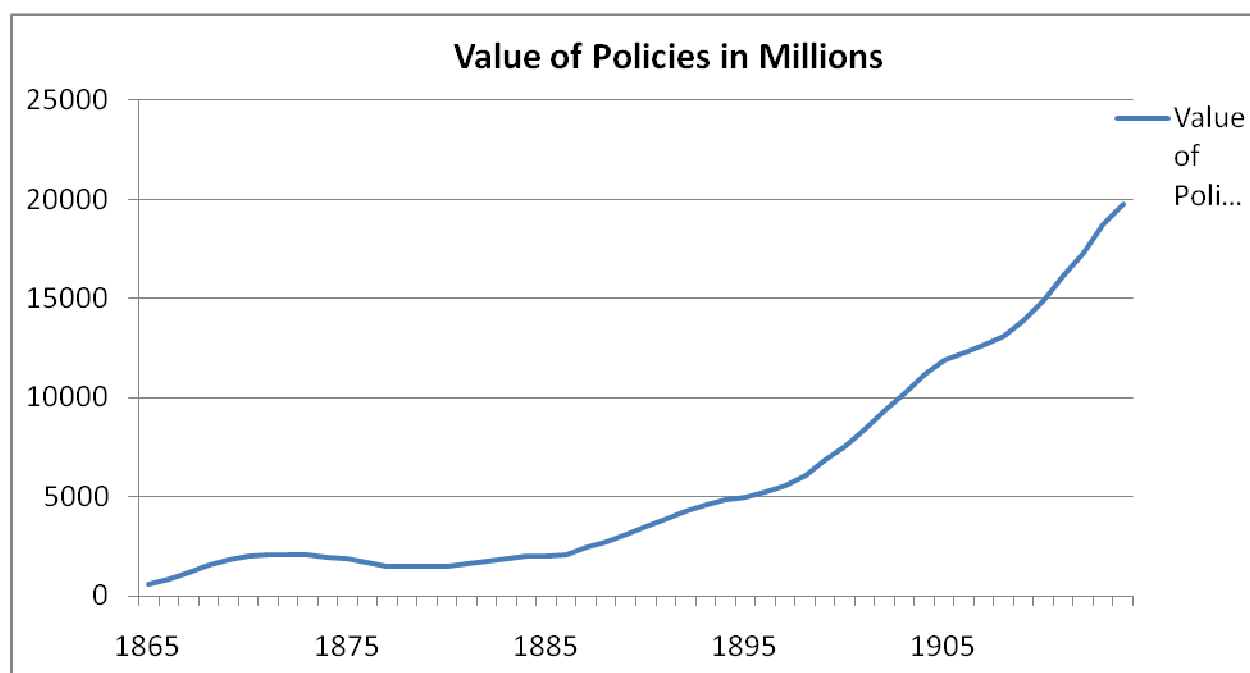
Figure 1.1 shows the result of the Panic of 1873. The resulting exit of companies effectively purged the insurance industry of marginal providers. The remaining companies survived since they had larger reserves and surpluses than other companies. The surviving companies also had a unique feature, they all offered tontine insurance.

The initial growth of mutual insurance from 1840-1860 was minimal and most likely reflected limited demand for life insurance and general legislative hostility towards life insurance companies [Murphy 2005: 24]. However, in the period after 1865 the number of policies in force grew exponentially as well as the number of companies. Figure 1.1 shows the rise in the number

¹ Figure 1.1 is compile using Table Table Cj713 in, *Historical Statistics of the United States, Earliest Times to the Present: Millennial Edition*, edited by Susan B. Carter, Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch, and Gavin Wright. New York: Cambridge University Press, 2006.

of insurance companies in shortly after the Civil War. While many of these companies did not survive the severe economic disruption of the Panic of 1873, there was at least a net increase in the number of companies that provided life insurance. However, the number of companies is not indicative of the growth of life insurance.

As we see in figure 1.2, the values of the policies in force grew exponentially.²



The companies that survived the Panic of 1873 underwrote most of the growth in new business. While Owen Stalson attributes much of the rise in life insurance to the heavy marketing and organization of the life insurance companies, it seems more likely that there is an increasing demand for life insurance. Livi Di Mateo and J.C. Herbert Emery studied the correlation between wealth and life insurance in Ontario, Canada for 1892. They found a strong negative correlation between wealth and life insurance. They concluded that life insurance was particularly in demand by segments of the population with little wealth since they had little accumulated

² Figure 1.2 is compiled from Table Cj715 in *Historical Statistics of the United States, Earliest Times to the Present: Millennial Edition*, edited by Susan B. Carter, Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch, and Gavin Wright. New York: Cambridge University Press, 2006.

reserves [De Matteo and Emery 2002]. The upper echelon of society who had accumulated substantial assets in the form of land, cash, businesses, etc... could easily provide for their families in the event of their death. Demand for life insurance increases in part due to the industrialization of society. Wage workers were far more insecure in terms of their economic well-being than farmers. Living on wage income meant protecting oneself against a loss in wages. In a single breadwinner household, this became very important. Coupled with familial responsibilities men and women increasingly sought economic protection for their spouses and especially children in the event of the loss of a spouse. It is important here to note that life insurance most often was purchased by middle-class Americans. The rise of the middle class in the United States and the rise of life insurance are strongly correlated. Purchasing life insurance exemplified a precautionary savings motive. It insured against lost income in the event of death, while the surplus and dividend accumulated by purchasing life insurance could earn interest. The increasing tendency for social savings in the form life insurance represents the sensitivity of families to the loss of income while also representing a modest life cycle saving behavior. We can view life insurance as a life-cycle institution since one conceivably invests in endowment, annuities, or paid up insurance as returns once a policy matures. The development of surrender values ensured that policyholders under stress to get some return on their investment.

Life insurance worked in concert with the expansion of mutual savings banks to offer a variety of new financial services to the population. Like mutual savings banks, mutual life insurance companies catered to wider strata of society, but paying dividends from accumulated reserves and death benefits instead of holding savings deposits. Unlike mutual savings banks the annual premiums required by insurance companies made life insurance difficult to purchase by average workers. Indeed most annual premiums per \$1000 ran from \$21.49 to \$43.34 from 1896

to 1908 for a man aged 25 from Equitable Insurance of New York at the point of issue.³ These rates varied due to the different policies an individual could buy. Rates increased as age increased, since the risk of death was much higher. By the time a man was aged 55 if he so chose to take out a twenty year life policy would pay annual premiums ranged from \$60.72 to \$70.51. While these premiums represented a general reduction from life insurance before the Civil War, they were not insignificant amounts of money. Average annual non-Farm income increased from \$453 to \$577 during the same time period.⁴ In relative terms since insurance premiums were fixed, income increasing and both affected by a general deflation of the nineteenth century, life insurance was becoming vastly more affordable. It clearly wasn't so affordable that paying the annual premium was not a serious financial decision.

Mutual companies operated with lower reserve requirements than joint stock companies risk assessment and actuarial soundness became critical for mutual insurance companies. Operating under the mutual model allowed for cheaper policies since the reserve was held as a portion of the premiums, instead of being a fixed cost associated with having to raise capital through some other means to underwrite insurance policies. Insurance companies could now underwrite policies based on the number of policyholders paying their premiums on time. Lowering costs increased the demand for life insurance and prompted two important innovations in the life insurance industry The first innovation was the advent of the America Life Table of Mortality developed by Sheppard Homans in 1868 [Murphy 2005:81]. Murphy writes:

Throughout the nineteenth century the America life insurance industry privately struggled to understand the risk at the core of its existence, while privately

³Spectator Company (New York), *Annual and deferred Dividends*, Spectator Company, New York, NY, 1914

⁴ Table Ba4280-4282, *Historical Statistics of the United States, Earliest Times to the Present: Millennial Edition*, edited by Susan B. Carter, Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch, and Gavin Wright. New York: Cambridge University Press, 2006

struggled to understand the risk at the core of its existence, while publicly touting the scientific rigor supposedly underlying the permanent and financial stability of life institutions.

Sheppard Homans was the chief actuary of Mutual Life Insurance based in New York, and he undertook the task of calculating the expected rate of deaths based upon Mutual's experience. Life insurance companies before Homans' table were plagued often with inaccurate data in constructing their own life tables. They often relied on the British experience, which clearly by the mid-nineteenth century had deviated enough from what the United States experienced. This meant that a critical revision of the life tables used to determine premium rates for insurance companies had to be revised.

Since death is certain for everyone, insurance companies required accurate measures in order to anticipate expenses and payouts as part of their operating costs. Mutual and Homans worked quite hard in making the life table that he constructed the industry standard. It eventually became the legal standard in the state of New York. Most of the companies who were industry leaders and chartered in New York quickly adopted this table. The American Experience Mortality table proved to be more accurate than the previous life tables that were different for each company. This standardization and legal codification of the Homans' table made the industry uniform. By having a uniform set of actuarial tables the insurance industry could set their rates in a more uniform fashion. It helped the industry as a whole predict the costs a company could expect in resulting from payouts due to deaths, defaults on payments, and other costs associated with new business. It helped to stabilize the fierce competition in the insurance industry, and made the industry relatively sound financially. By having uniform actuarial standards, the state of New York set ground rules for new companies and how they were financially managed.

Like all financial firms Life Insurance companies are institutions that leveraged their reserves and accumulations for the benefit of their policyholders. In theory the money held by the insurance company was available to policy holders upon the death of the insured. This allowed insurance companies to accumulate capital at very high rates. But it also required accurate actuarial tables by the insurance companies to make sure that death, default, and lapses were accounted for. Under anticipating losses would cripple an insurance firm's ability to pay its losses and therefore make the firm insolvent. Overestimating losses would reduce the insurance firm's ability to invest surpluses and limit returns to investors. Homans' table of Mutual's experience with life insurance allowed a much more accurate prediction of losses and costs in the insurance industry. While Homans' table is crude, particularly in regard to later actuarial methods, it was an advance since it was the first table to attempt to describe American behavior. Homans' table was the minimum and most conservative actuarial table upon which insurance companies could base their financing upon. State requirements for insurance company reserves had to be based upon the American Experience Life Table.

This table while providing a basis for financial planning did not disallow insurance companies from making their own predictions and judgment based upon their own experience. In particular Equitable Life insurance would alter Homan's table to anticipate much more favorable predictions of its returns that would actually occur. Equitable would also assume a higher lapse rate than it actually experienced. Homans' table helped to anticipate costs and helped investment decisions by insurance companies but actual economic conditions would vary. Economic downturns, changes in the insurance industry, and changes in social policy would impact how accurate the actuarial tables would be in predicting future business costs and returns.

An equally important innovation was the development tontine insurance in the 1860s by Equitable Insurance Company of New York. Equitable's tontine insurance was so popular that by the end of the nineteenth century most insurance in force was based on the tontine deferred dividend plan. Originally the tontine was developed by Lorenzo Tonti in 17th century France. Tonti's plan was built in was borne out of the need to raise massive amounts of money for French militarism. The tontine operated by pooling capital investments by several individuals together and then investing them together in a giant fund. Depending on the various types of tontine fund annual dividends could be paid out to holders of the tontine [North 1952: 6]. The survivor or survivors, depending upon how the tontine was structured, would not only have received annuity payments but a share of the remaining initial capital investments from the original investment.

In the United States the development of tontine insurance occurred after the Civil War. The life insurance industry in the nineteenth century United States was and still is mostly state regulated. This led toward some differences in the industry, but insurance companies for the most part mirrored one another. Equitable insurance company was the first company to aggressively market tontines to the general population.

The tontine plans required annual premiums for policyholders. Also named as tontine savings plans, it combined life insurance with the tontine principle. An individual is insured for the amount that was on the policy. Upon their death they could not receive the accumulated surplus unless the policy had matured and they had survived the tontine policy period. Equitable initially led the industry in offering tontines because of the difficulties it had in competing with Mutual Insurance Company. Mutual had larger surpluses that were being distributed to its policyholders trying to undercut Equitable. This particular innovation was the result of intense

competition in the New York life insurance industry. Henry B. Hyde the founder and president of Equitable Insurance engaged in an insurance war with the Mutual Life insurance company. Not only were both companies slashing premiums rates, they competed for sales agents, and waged pitched battles in the press. Mutual attempted to drive Equitable out of business by offering what had been up to then unheard of, annual dividends from the insurance surplus. Equitable being a newer company had a significantly smaller surplus and would be vulnerable to a run on its surplus [Buely 1959, 150].

Ever since the 1850s mutual insurance companies came to dominate the industry since they offered dividend to their policyholders. Mutual insurance companies had a benefit for policy holders in that policy holders were also share holders in the company and were entitled to dividends on investments and surpluses that the company generated. Insurance laws generally allowed insurance companies to determine their own timetable for declaring dividends and surpluses, usually in five year periods. In advertising annual dividends Mutual attempted to force a run on Equitable's surpluses. The amount of surpluses for insurance companies, that is money in excess of expenses incurred in operating insurance, were advertised as symbols of health and strength of insurance companies. Equitable stopped the run on its surpluses by deferring surplus payments through the use of tontines [Buley 1959: 145].

Tontines account for the vast majority of insurance sales through 1905. Ransom and Sutch contend that tontine insurance was an innovation for accruing assets for old age [Ransom and Sutch 1987: 379]. It serves as a tremendous life-cycle asset for the individuals who could buy it. The interesting thing to consider about tontines is just how broad the tontines were in their appeal to all segments of society. While the impoverished could never really afford to save for old age, an increasing segment of the middle class, and professionals began to save through this

plan. In fact company memos detail the marketing of tontines towards Pastors and clergy members, as a way to make tontines more respectable.

The tontines provided a method for savings in retirement. In the era before national banking insurance companies were some of the largest national financial institutions. Life insurance companies represented safe savings institutions. The tontines and life insurance proved so prolific that an estimated third of the American population held policies. Tontines could also produce better rates of returns over mutual savings banks and constituted most of the new policies written after 1880. Mutual savings banks averaged 4.5% rates of return while the rate of return from tontines from 1871- 1891 are around a nominal rate of 6.5% which not only was significantly higher, but in an era of falling prices represented a real growth of wealth through savings [Ransom and Sutch, draft 1986: 20].

Tontine insurance differed from normal level premium life insurance since the policy surplus would be reinvested by the company for the policyholder and disbursed at the end of the term not throughout. Henry Baldwin Hyde, working with Sheppard Homans the chief actuary of Mutual, developed tontine life insurance. It would operate under various titles with other insurance companies. Hyde and Equitable aggressively marketed tontines as a form of savings rather than simply a form of insurance. Tontine savings plans combined life insurance with the tontine principle. The individual policyholder is insured for the amount that was on the policy. Upon their death the beneficiaries would receive the amount on the policy. They could not, however, receive the accumulated surplus. Policy holders would receive a surplus/dividend once the policy had matured and survived the tontine policy period. By delaying the payment of the policyholders' surplus/dividend Equitable's surplus remained intact despite pressure from Mutual. Though Equitable stopped the run on its surpluses by deferring surplus payments

through the use of tontines, this form of insurance initially performed poorly [Van Cise 1895: 6].⁵ Some changes were made to the tontine insurance plans in order to attract more customers. The policy on lapse and defaulting on the insurance proved to be punitive to potential policy holders. Instead Homans and Hyde, revised the program, allowing individuals at set periods to draw the surplus in cash, as well as be given a surrender value [Van Cise 1895: 9]. The Semi-Tontine incentive allowed policyholders some financial leeway without losing their entire investment if they could not afford an annual payment since they could have a policy surrender value. That way if a policy lapses there is the option of either taking paid up assurance or the cash surrender value on the policy. Rather than locking a person into a twenty year commitment this gave room in case of exigent circumstances. Semi-Tontines came to represent nearly all the policies written in the United States [Van Cise 1895: 17].

Tontine insurance works by deferring the dividends that policyholders would normally receive annually. Under normal term life insurance the policyholder would receive dividends that are disbursed at some pre-determined period during the life of the contract usually five years. Under tontine insurance annual dividends were withheld and reinvested by the company which would give the policyholder a higher rate of return than under normal term insurance for the duration of the policy. In addition, to the reinvested dividend that the policyholder would receive when the policy matured, the policyholder would receive the deferred dividend of those who defaulted on their policy and the surplus of those who died under the policy. In addition to the paid up cash value of the policy the ultimate payout of the policy after twenty years would be quite significant. This was the major selling point of the life insurance policies, returns from the tontine policies offered significantly better rates of returns. Tontine policies often were

⁵ Van Cise, Joel G., *History of the Tontine Policies Issued by the Equitable Life Assurance Society*, Axa-Equitable Archives, New York, New York, 1890, 14

advertised using projected returns that were calculated using Sheppard Homans' American Experience Mortality table. The mortality table was then combined interest rate and the rate that policyholders among a certain cohort would default on.

From the Armstrong Committee reports on the insurance industry in 1905, we can see that Homans' table calculated not only the death rate but also the expected lapse rates for specific cohorts of policyholders [Armstrong Committee 1905: 913]. These projections primarily were to allow the insurance industry to project costs well in advance, but under the tontine plan, the projections could help predict return rates for policyholders. Homans based his return calculations in four parts. The first was that invested funds would earn an interest rate of six percent. He assumed mortality would be low and that eighty percent of the mortality table since medical screening would remove bad risks. Company expenses he predicted would be constant and a fraction of the premium. This meant that the dividend would also be constant. Lastly, Homans assumed that lapses in premium payments resulting in default would be constant [Van Cise 1895:30].

While the projected payments of the period were very generous and useful as a marketing tool, many policyholders would be disenchanted with the actual performance of the policy. The policies underperformed when compared to the initial projections during the point of sale. When called to testify before the committee Joel Van Cise, the chief actuary of Equitable insurance company, attempted to explain the reason for the large disparity between advertised potential returns and actual returns. Van Cise argued that the largest reason for the disparity in the projected returns and the actual returns was largely due to the decline in prevailing interest rates. The following table is taken from Historical Statistics of the United States table Cj1250.

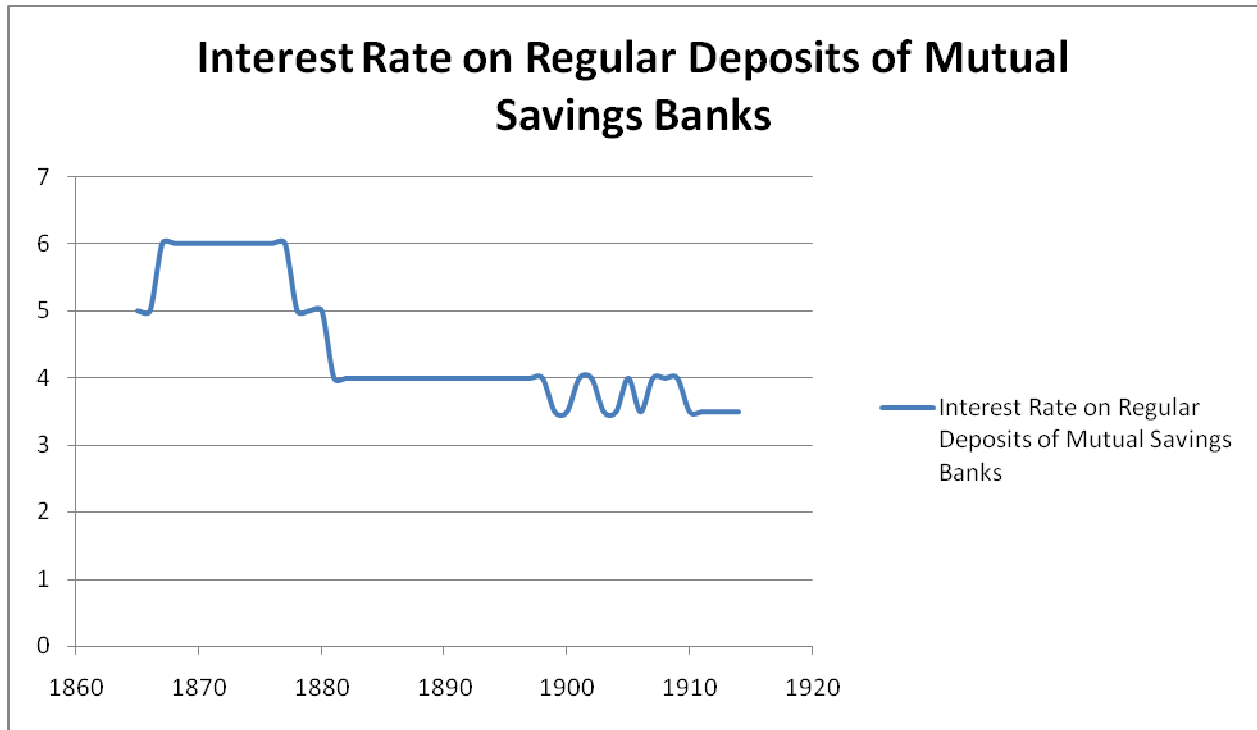


Figure 1.3 Prevailing Interest Rates

This demonstrates Van Cise’s contention that the projections Homan’s had developed in the 1870s did not reflect actual business conditions was correct. Homans’ assumption of a six percent continuous interest rate was significantly off. This period in American history had an average interest rate closer to 4.5 percent. Homans’ assumptions of a favorable interest rate to policyholders were not corrected. Advertisements and projections for tontine insurance still used Homans’ calculations in the 1880s and 1890s that were created under more optimistic business conditions in the 1870s. Clearly the insurance companies knew that lower insurance rates were affecting the returns. Van Cise was privately, deeply concerned about the generous results the tontine rate books used for marketing purposes [Van Cise 1895: 19].

Equitable insurance company in 1889 issued a note to agents on how to handle estimates.⁶ Agents were encouraged to provide estimates based on their knowledge particularly

⁶ Equitable Insurance Company, *Note to Agents No.59*, Axa-Equitable Archives

while canvassing for new business. Insurance agents were for the most part employed through soliciting agents. Agents were often recruited from other insurance companies and without regard to much formal training. Insurance agents would often be seen collecting insurance premiums at the local bar or pub. While the insurance agent profession was in its infancy, it appears agents may have been overzealous in their estimates of potential returns from tontine insurance. At the very least the insurance companies did very little to correct the problem of overestimating returns. Agents' commissions for new business which increased from 20% in the 1870s to 50% of the first year premium, by the 1900s undercut the accumulative value of the tontines.⁷ The commissions for new insurance were drawn from the surpluses and reserves in the first year of the insurance. The first year of insurance also represents the largest single contribution to the tontine fund by policyholders. More policyholders lapse in this one period than any other. By drawing insurance agent commissions from the surplus cost of insurance directly greatly reduced future returns from the investment of the tontine. With a 50% commission only a small portion of the money would actually go into the tontine fund. The actuaries who calculated the rate of return and kept the ledger books of the insurance companies when called before the Armstrong Investigation in 1905 seemed to ignore this fact in their calculations.

In addition to the problem of commission Homans' calculations also did not prove accurate in accounting for the lapse rate of policies. Because of the popularity of the tontine fund and the successful screening of applicants, the lapse rate on tontine policies was much lower than expected [Ransom and Sutch 1987: 390]. The lower lapse rate combined with lower prevailing interest rates and higher than expected administrative costs driving down the actual performance of the tontine policy. When individual policyholders began to cash in the paid up policies the

⁷ North

found their policies were worth significantly less than what was projected by the sales agents [Ransom and Sutch, draft 1986: 30]. Obviously, this caused much consternation amongst the policyholders who had expected higher earnings on their policies. Angry policyholders would eventually petition the government to redress their grievances. By 1905 a full scale investigation of the life insurance industry was underway in New York.

The question of what explains the disparity between what returns should have been versus the actual, somewhat disappointing performance of the tontine lies in the intuitional arrangement of the life insurance industry. Business practices that resulted from the intense competition particularly amongst New York insurance companies necessitated large work forces of agents ready and able to sell life insurance policies. Marketing of life insurance became extremely critical. In addition to these additional costs associated with a competitive marketplace, was the cost of maintaining a political order that quashed reform legislation that targeted the insurance companies. These costs increasingly undermined the profitability of the tontines resulting in even lower rates of return to the policy holders. In their drive to generate additional business, life insurance agents and companies resorted to a practice of twisting, where by insurance agents would offer cash and rebates to for individuals to change companies with their policies [North 1952:20].

The Armstrong Commission reports contains a damning report on the insurance companies and their excesses, though not the actual economic soundness of tontines and their benefits to individuals [Armstrong 1905: 934]. The reports describe and attack the various excesses of the insurance industry and pushed for regulations, that eliminated the tontines.⁸ This included better accounting practices and increased policyholder control in the decision making

⁸ The Armstrong Commission Records along with Equitable Archive's were burned in 1910 and 1911 limiting some more useful data and internal correspondences. What survives is the Committee report published in 1905 and 1906.

process of the insurance company. It also called for the end of differed dividends and required annual dividends. The commission appears to have accepted the argument that the large surpluses in the insurance companies had proved to be too much of a temptation for individuals to use for personal gain.

Ransom and Sutch [1987, draft 1986] argue that despite the graft and corruption that occurred in the insurance industry, tontine insurance was actually economically sound. The rate of return as calculated by Ransom and Sutch [draft 1986] was 6.17 percent compared to the projected rate of 10.4 percent. Ransom and Sutch corrected for the declining interest rate, lower lapse rate and increasing administrative costs. While the 6.17 percent return rate was lower than advertised in an era of declining prices it still would have been a significant amount. Also, the rate of return was still higher than what mutual savings banks could offer, and given the volatility of banking in the late nineteenth century it may have been safer to put money away in life insurance. Using a series of simulations Ransom and Sutch [draft 1986] postulate that:

Only about 18-20 percent of difference between the predicted and actual rates of return can be attributed to an inaccurate forecast of expenses. By contrast the fall in the rate of interest explains close to 40 percent and Homans' miss estimate of the lapse rate accounts for one half of the difference.

The decline in the general interest rate is well documented for the late nineteenth century United States. The resulting lower returns of tontine insurance were mostly the result of lower insurance rates, and lower lapse rates as individuals held on to tontine policies as a form of investment and not merely a consumable good.

It is important to note however that standard industry practices may have further undermined the returns to policy holders of tontine insurance. The practice of rebating for policyholders to shift policies, along with high commissions for insurance agents placed surplus

fund in a precarious situation. North noted that in many instances because of these increased expenses that companies would use the surplus accumulated to pay off the expenses incurred in underwriting new business [North 1952:20]. In some instances the costs associated with new business were so significant that the normal loading associated with life insurance premiums in the first year were tripled, resulting in the company having to withdraw money from the surplus fund. If we run a simulation in a scenario where the first year's tontine fund contribution is wiped out due to administrative costs it reduces the rate of return nearly two percent. This is not a trivial amount of money. This first year contribution is the largest amount of money and it is the principal amount that will grow the most compared to any other year. Loading, that is the expected costs of new business built into the premiums were ineffective. Loading established margins of expenditures that were consistently violated. Equitable, Mutual, and New York Life each ran over three hundred percent of their margins set aside for new business [Armstrong Investigation Report 1905:304-317].

Also additional costs that were kept off the books contributed to the costs associated with life insurance. Money used to purchase subsidiary organizations and their involvement in syndicates undermined the profitability of the insurance companies. The companies in New York were placed into dependent positions with respect to the New York investment banks and syndicated. The large accumulation of capital based on life insurance savings had led the largest insurance companies into intimate relationships with the major investment banks of New York City. Their accumulation of capital especially after the development of tontine insurance proved the ideal source of liquid assets for the banks. Tontine insurance had allowed insurance companies to accumulate massive amounts of capital that was not subject to calls by depositors or creditors. Insurance companies not only bought shares or companies as parts of a syndicate

but also propped up prices through purchase and holding agreements [Armstrong Committee 1905:191]. These accounts were often off the book, run through individual board members as collateral loans, or subsidiary organizations. The result of this linkage with the banking houses of New York is that life insurance companies become dependent upon the investment banks for investment opportunities for the capital that insurance companies accumulated. Securities were increasingly preferred over mortgages as investment for life insurance companies.

Mortgages represented 59.2% of all life insurance assets in 1860 were in the form of mortgages issued, but by 1900, they were only 28.8% of life insurance assets.⁹ The shift away from mortgages to securities represented the demands of the New York investment banks not necessarily the profitability of these securities. Mortgages though incurring higher origination costs were more profitable than securities in syndicates, which because of their dependent positions relative to the banks, had lower rates of return. The Armstrong Investigation revealed that some of these securities paid out only 2% to 3% returns under the syndicate rules. Instead, these securities were purchased for enriching the board members by increasing stock prices etc [Armstrong Committee 1905:316]. The shift away from mortgages was justified to life insurance companies by Zartman who notes:

Mortgages run for short periods, and with a decline in the interest rate they are paid off. After 1890 the rate of interest declined sharply, and as a result most of the companies seem to have been animated with a desire to get the funds under their control invested in long-time securities [Zartman 1907:32].

New York State laws also made it increasingly difficult to sell mortgages outside of the state of New York. Most insurance companies in New York eventually limited themselves to mortgages in the city of New York [North 1905:117].

⁹Compiled from Lester W. Zartman, *The Investments of Life Insurance Companies*, New York, Henry Holt and Company, 1907 : 14

Mortgages in the late nineteenth century had features that were detrimental to long term investments. They often were five year loans that required almost immediate principal repayment. They were small loans often floated to farmers in the Midwest, which was the most profitable mortgage market [North 1952:117]. This hardly served the long term needs of the insurance industry. That being said the sheer size of amount of money that the insurance companies held in mortgages had to have a profound effect on the macro-economy. In 1888 mortgage assets in the insurance industry was totaled at \$260,965,200 which represented forty percent of all life insurance assets.¹⁰ By 1904 mortgage assets totaled \$623,691,963 but represented only twenty-eight percent of all assets held by life insurance companies.¹¹ This statistic is slightly skewed since the New York companies were so much larger than most of the other companies, and were much more intimately tied to the investment banks which required their capital.

The effect of this capital flowing into the mortgage markets in the United States must have had some profound effect on mortgage rates in the United States. It warrants further investigation to see how these loans were originated and obtained by individuals. Insurance agents or agents acting under the authority of the company could issue loans. There is a lack of secondary literature upon how these loans were originated and what criteria were used to establish loans upon collateral and property. Indeed the secondary literature does not mention any of the formal relationship between mortgages and insurance companies at all, at least until the 1930s. Farm mortgages were the most lucrative form of mortgages to the insurance companies. While the New York companies began to shift their portfolios towards securities

¹⁰ Spectator Company, *Spectator Insurance Year Book*, 1888, New York, NY, Spectator Company, 1888:506

¹¹ Spectator Company, *Spectator Insurance Year Book : Life and Miscellaneous Insurance Volume*, 1904, New York, NY, Spectator Company, 1904 :514

Northwestern Mutual located in Wisconsin, one of the largest insurance companies maintained nearly half its portfolio in Mortgages and bonds backed by mortgages through 1904. Still insurance companies in from the Northeast still held quite a few mortgages and mortgage backed securities. This represents capital flowing out of the Northeast to the Midwest where it was needed. Clearly this helped to expand the credit markets in the Midwest and west as insurance companies were willing to finance farming throughout the country using Northeastern capital. In fact given how effective insurance companies had been in establishing themselves throughout the country they could get across interstate rules governing mortgages much more easily than banks could. What exact effect this had on the credit market is unclear but it we can make a few generalizations about it. Credit was more widely available because of it, and it was cheaper to borrow since insurance companies were ready and willing to lend.

It is unclear at this point whether the mortgages were issued directly by the insurance companies or solely subsidiary institutions. The Spectator insurance catalog which was an industry publication lists the category as Bonds and Mortgages. Insurance companies clearly hold property backed bonds and mortgages, but the mechanism of how they came to own them is unclear. It is also unclear how these loans were issued. There perhaps is a clue in the charter of the Northwestern Mutual. The original charter of the Northwestern Mutual allowed the company to hold its reserve assets in the forms of mortgage loans that could be secured by real estate, so long as the value of that real estate was twice the value of the originated loan [Spectator, Charters of American Life Insurance 1911:217]. This gave Northwestern the authority to issue mortgage loans, with a statutory requirement that the mortgage could only be half what the property was worth.

This form of mortgage and bond was perfectly structured for farms since the working farm could represent added on value to help originate the loan. These loans however, could not be issued to unimproved farmland. Section 25 of the Northwestern Mutual's charter states:

No loans on Unimproved Country Real Estate. – Investments of the company's funds may be made in the form of notes as well as bonds, secured by mortgage or security or trust deeds of unencumbered real estate, and no loans shall be made by the company on security of agricultural lands, except on improved farms, and then not beyond half the value of the property offered as security, exclusive of the buildings [Spectator, Charters of American Life Insurance 1911:235].

Most of these mortgages appear under these conditions to be short term functioning as a credit mechanism for farms year to year. This mortgage was most likely to give short term credit to farmers and finance small scale capital improvements. In 1887 a law was passed allowing companies to hold mortgaged backed bonds and securities with the same stipulations on the property that was the collateral for the bond or note [Spectator, Charters of American Life Insurance 1911:231]. The finance committee of the Northwestern Mutual was the internal department that was responsible for issuing these loans and overseeing the requirements for these loans. Mortgage loans in New York on the other hand were used for urban residential property. New York state law had limited what mortgages New York insurance companies could issue. New York insurance company executives who wanted to enter into speculative real estate ventures in New York had a readily available corporate partner. In fact this use of funds to purchase real estate for directors and board members was cited as one of the most egregious abuses of power and authority. It was the well publicized graft and corruption of insurance executives in New York, along with the unrealized rates of return that had been promised to policyholders that ultimately spurred a state investigation and reforms. One notable real estate venture that failed was the Depew Improvement Company. Led by Senator Depew of New York,

who was an Equitable director, his real estate company failed in 1903 resulting in a multimillion dollar loss to Equitable [Armstrong Investigation 1905:92].

This negative event came to light with the muckraking reports at the turn of the century in New York. The insurance industry already under disrepute because of discrepancies between its projected returns to policyholders versus actual returns received another beating in the press. Equitable Assurance Society who had been founded by Henry Baldwin Hyde was embroiled in a very public power struggle between James Hazen Hyde, Hyde's son, and William Alexander the President of Equitable after the elder Hyde's death. This battle played very badly in the press. While Hyde managed to retain control of the insurance company he had done so with a princely attitude that had marginalized him from the American press. He had spent much of his youth in France and Europe living a prince's life. While he was Princeton educated he demonstrated very little interest in the actual day to day running of the insurance company. Patricia Beard described that Hyde viewed his relationship with his father's company was one of a "custodial responsibility to the heir to a family estate [Beard 2007:289]." The lavish lifestyle that Hyde displayed, especially when considered with his spend thrift father, was widely unpopular.

When the Armstrong Committee hearings began and Hyde was called forth before the committee it was a moment of high drama. The committee also revealed an ugly truth of the life insurance industry. While Hyde demonstrated in some sense his own detachment from the insurance company he was forced to grapple with Charles Evans Hughes who was the lead attorney for the committee. When questioned about a special account which had been set up by the Equitable at the Mercantile Trust Company unethical practices emerged. The following is an excerpt from the Committee Hearings:

Q (Charles Evans Hughes): Did you learn for what purpose this account had been used?

A (James H. Hyde): The Purpose----

Mr. Untermeyer: Did Mr. Alexander state it?

A (James H. Hyde): Mr. Alexander stated to me the purpose, which was threefold. First, to settle suits which might tie up the affairs of the Society in a long litigation and generally interfere with the business and cause great complication and make a great deal of loss of time, and bother. The second purpose was the purchase of stock, as this stock from old stockholders had been bid up by speculative interest in a fictitious value, basing that value on the rights of the stock in the surplus. It was hurting our agents in the field, being used as an argument against them in canvassing, and it was considered advantageous to counteract that as far as possible. The third purpose was political contributions.

Q (Hughes): And what were they, so far as you were informed of them?

A (Hyde): I know of only one of those, which was for the last presidential campaign. [Armstrong Committee Hearing 1905:2915]

The hearing revealed underlying problems within the political economy. William Jennings Bryan's campaign in 1896 was particularly threatening to the financial sector. They organized heavily for McKinley and his campaign. Through connections in the Tammany Hall political machine, and control of upstate Republican lobbying groups the life insurance companies effectively controlled legislation until 1905 [Armstrong Committee Hearings 1905:2568-73].¹² By that time the insurance industry was intimately intertwined with the investment banking firms and that intimate political and economic association provoked a populist reaction against insurance companies that fundamentally altered the industry. Within months of the hearings reforms were adopted that separated the insurance industry from the banking syndicates that effectively created a wall between the insurance companies and banking institutions.

The banks and board directors who had controlled the life insurance companies bought back most of the assets that the insurance companies had to sell off [Brandeis 1914:16].

¹² One of the more interesting characters was a person called Judge Coman who was put on retainer by Equitable at a salary of \$6000 a year to "fix" certain problems that plagued Equitable officials.

Ironically this had the effect of shielding the insurance companies from the Panic of 1907, but also removing them as a potential solution to the liquidity crisis that J.P. Morgan had to contend with. Though the story of runaway insurance and financial corruption that was revealed in 1905 by the Armstrong Committee and other banking excesses revealed by the National Monetary Commission from 1909-1912, and the Pujo Committee in 1913-1914, represented a change in the economic orthodoxy. The values of thrift and rugged individualism had begun to crack and conglomerated wealth, particularly the result of financial engineering was becoming unpopular. No one put it better than Louis Brandeis. Brandeis wrote that vast fortunes “are inconsistent with democracy. They are unsocial. And they seem peculiarly unjust when they represent largely unearned increment [Brandeis 1914:222].” The pro-business unfettered capitalism hegemony of the Republican Party that emerged from the Civil War had finally given way to something different, though it would have to wait until the Great Depression to be codified. But the lesson here, as much as the insurance industry history is one about graft and corruption, is also about incredible innovation with financial products that were sound and provided alternatives to traditional forms of savings. They did have a transformative power in the American economy and they did expand life insurance to a wider segment of society.

Conclusions

The experience in using life insurance in the United State as a savings method provides not only the historian with a different way of viewing the development of social insurance but the economist with a period of experimentation to examine the implications of privatized retirement. Tontines held out the possibility to fund retirement and represented precautionary savings because tontine policies could be converted to annuity payments. If after ten years of

payment the policy holder decided to have his surplus drawn and paid out as a fixed annuity it would provide a fixed income for the policy holder. The data from 1890-1905 is revealing about how much money the life insurance industry was annually spending on annuity payments. The data also from these years also allow us to calculate the actual returns to different classes of tontine insurance (see appendix).

The innovation of tontine life insurance should not solely be viewed as a marketing tool for the expansion of the insurance industry. There was an inherent demand for a savings method of some sort. The remarkable flexibility of the insurance policy as a financial tool also was a powerful incentive for possessing an insurance policy. Insurance companies would allow individuals to take out loans on a portion of the policy widening the credit available to the policyholder. Having a tontine insurance policy meant more than simply insuring income to a family in the event of a premature death. Rather tontine insurance once paid up over a ten or twenty-year period could help fund retirement or supplement a policyholder's income, as they grew older. According to the life cycle theory of economic behavior individuals would save during peak earnings years in order supplement consumption. Life insurance from 1865-1905 proves to be one of the critical life cycle institutions in a remarkably dynamic period of change in the United States economy.

If it is needed the policy or account holder and withdraw their accumulated savings and investment at a premium. In this sense the tontine is merely a level premium plan that had a fixed annuity feature that accumulated savings for the policy holder. At the end of the tontine period you could draw your accumulated surplus in addition to the reserve that had been set aside in the policy, which also had accumulated interest. Typically the three main options for a policy that had matured were a cash value, paid up policy, or cash surplus. One could directly cash out the

cash surplus directly at the end of the tontine period. This would be the accumulated surplus cost of the insurance. In the case of Northwestern Mutual (Northwestern only issued tontine insurance for a brief time period) the reserve and the surplus were available at the end of the policy. The cash value option allowed the policyholder to draw money against the value of the insurance policy. And lastly the paid up option allowed individuals to continue their insurance without premiums.¹³ Since the average insurance policy was approximately \$3,000 the accumulated cash value of the policies would be near \$1500 based on projections from Northwestern Mutual.¹⁴ Depending on the insurance company the returns could vary significantly. And if we assume that individuals cashed out their policies along with the surplus for somewhere in the neighborhood of \$1500 that would roughly be three years of annual income during the nineteenth century. Or some plans allowed that paid up insurance policies could be converted to annuity payments. To be sure there were clear problems with the graft and corruption of the insurance industry that required reform. Clear accounting practices, separation between the insurance functions and investment banking were needed. This is important for us to understand in the examining savings behavior in the late nineteenth century. Americans were remarkably inventive in savings and capital accumulation. In looking at life-cycle savings or precautionary savings, we must not accept the simple notion that there were no alternatives to state-sponsored social insurance programs. The tontine mathematically worked. How well it worked is quite subject to debate. But the existence of private market alternatives gives us a new narrative that scholars, both in economics and history must debate. The answer to why is the United States so late in developing a welfare state is much more complex than a lack of institutional or political capacity. It

¹³ Northwestern Mutual, *Points for Agents Concerning the Tontine Dividend Plan of the Northwestern Mutual Life Insurance Company*, Northwestern Mutual Company Archives, Madison, WI, 1895

¹⁴ The Average policy size here is assumed to be the mean of the number of policies divided by the total value of policies in 1904 from the Spectator Insurance Yearbook

transcends the simple explanation of the lack of a united union effort or an overpowering pro-business culture. Rather if we look at the margins of individual decision making, we might find that there were alternatives to the welfare state, however incomplete, as forces that might constrain the development of a welfare state. Tontine insurance can be one of those mechanisms.

The key features of the tontines are essentially the key feature of modern social insurance, savings plans, and pensions. All depend on a large group of depositors leaving their money with an institution which manages the funds for a small administrative fee. These funds are available after some pre-determined time period to the policy or account holder for their usage. In fact if one were to carry the analogy tontine insurance forward we can argue that Social Security is essentially a modified tontine. One of the Social Security program's key component is the Old-Age Insurance program pays retiree benefits in the form of an annuity, and the survivors' benefits for children and survivors of workers who are insured. Most American workers pay into the system but don't necessarily have to take advantage of it. So tontine insurance despite its reputation is in some sense present with us to this very day.

Appendix Tables

Tables one and two were generated using the suppositions based on the original prediction by Actuary Sheppard Homans. They are based upon a \$1.00 contribution from policy holders under a twenty year tontine plan. Table one is based upon Homan's American Experience Mortality Table. Table two is based on a similar mortality table called the Actuaries Mortality Table that several smaller insurance companies relied upon making projections. There is little difference in the result if we substitute the tables for one another. The adjustment factor is the percentage of which the insurance companies expected deaths and losses to be more

favorable. The use of agents to filter out bad risks helped relieve risk, and therefore the death rate and loss rates amongst policyholders was expected to be much more favorable than the population at large.

Table three and four are based on observations from Spectator Yearbooks and Annual and Deferred Dividends recorded after 1905 for all policies dating back to the 1870s. The mean policy of the 1890s was rounded to \$3,000 since individuals purchased insurance by the \$1,000 and the average annual dividend per policy was approximately \$4. The policy assumes a rate of 6% interest for the first five years while data from 1885-1900 are used to calculate the impact of interest rates on the rate of return. The data is the aggregate return on all mean investments of insurance companies from 1885-1900. Joel Van Cise noted that in calculating the interest rate upon which to apportion to policy holders they used this rate. The amount calculated is straight forward. We take the predicted contribution from based on the actuarial table and compound the interest of that contributed to the fund for that year compounded for 20 years. That's how we derive the number for the survivors' contribution for the first year. The next year we use the actuarial tables to derive what the contributions will be. Sheppard Homans' noted that the experience of tontine insurance would be different than normal insurance. We see that reflected in the adjustment factor Homan's proposed. He assumes death and lapse rates would be different. We multiply the death rate and lapse rate by this adjustment factor to predict how many lapses and deaths the actuaries would receive from the year previously to get that year's potential contribution to the tontine fund. In our simulation we receive a nominal rate of return of approximately 11.5% in all the simulations. Demonstrating the soundness of the tontine.

Future Work

The Spectator Insurance Yearbook contains quite a bit of industry wide data. Though the Spectator Life Insurance Yearbook does not contain every single life insurance company we can still make generalizations. The Spectator Insurance Yearbook does record the major life insurance companies allowing us to make those generalizations from the data. The data includes yearly totals on lapses, deaths, annuity payments, investments, and debt data. With this data we can more accurately assess the legacy of Tontine life insurance. But the yearly reports and exhibits also reveal information about the investments of life insurance companies and their impact upon the overall economy. Of note to finance and monetary specialists are the tables that record the investments of life insurance companies into mortgages and mortgage backed securities. By the 1890s most major insurance companies had half of their portfolios made up of mortgages or mortgage backed securities. Given the wide accumulation of money this accumulation had the effect of lowering interest rate nationally. A database will developed of the top thirty insurance firms from the Spectator Yearbooks. There will be firm level data that will provide invaluable insights to the researcher. Documenting the changing values of the consumer who bough life insurance, from the elite and well to do, to the middle class financial institution it became in the twentieth century will be critical. It will help us examine how risk in modern capitalism affected individuals and altered their behavior and savings patterns. We should also examine the marketing literature to see how life insurance demand was changed with changing cultural values. While this essay has focused on

Secondly future work should be done in the insurance archives to examine the farm mortgages that originated with the life insurance companies. It is important to examine these loans to look at the nature and function of these loans as they served to move capital out of the industrial northeast to the farmers of the west. The terms of these loans may be quite revealing of

the financial pressures farmers were facing in the Midwest. In many ways looking at the structure of these loans and creditors is key to understanding the agrarian revolt in that led to the candidacy of William Jennings Bryan. Douglass North and Lester Zartman both note that mortgages were highly profitable to the insurance companies. It appears from the Northwestern records that these loans are designed as credit for farmers based in the Midwest. If that is the case these loans could prove to be invaluable resources to economic historians studying the relationship between credit and farming in the Midwest. In particular it would reveal to the scholar the nature and relationship that farmers had with debt. That in turn would give us a better explanation of how they reacted to mounting debt, which was embodied in the Agrarian revolt and free silver movement.

Sheppard Homans Table

Year	Age	Mortality	Adjustment Factor	Lapse Rate	Deaths	Lapses	Survivors	Survivor Contribution*
0							1000	\$ 3,207.14
1	30	8.95%	50%	10.00%	4	100	896	\$ 2,709.50
2	31	9.09%	60%	8.50%	5	76	815	\$ 2,324.92
3	32	9.23%	70%	7.50%	5	61	748	\$ 2,014.65
4	33	9.41%	80%	6.50%	6	49	694	\$ 1,762.77
5	34	9.59%	80%	6.00%	5	42	647	\$ 1,550.45
6	35	9.79%	80%	5.50%	5	36	606	\$ 1,370.78
7	36	10.01%	80%	5.00%	5	30	571	\$ 1,218.18
8	37	10.25%	80%	4.80%	5	27	539	\$ 1,084.64
9	38	10.52%	80%	4.50%	5	24	510	\$ 968.59
10	39	10.83%	80%	4.30%	4	22	484	\$ 866.55
11	40	11.16%	80%	4.00%	4	19	460	\$ 777.50
12	41	11.56%	80%	3.50%	4	16	440	\$ 701.04
13	42	12.00%	80%	3.00%	4	13	422	\$ 635.17
14	43	12.51%	80%	2.50%	4	11	408	\$ 578.24
15	44	13.11%	80%	2.00%	4	8	395	\$ 528.87
16	45	13.78%	80%	1.50%	4	6	385	\$ 485.95
17	46	14.54%	80%	1.00%	4	4	377	\$ 448.53
18	47	15.39%	80%	0.05%	5	0	372	\$ 417.72
19	48	16.30%	80%	0.00%	5	-	367	\$ 388.94
20	49	17.40%	80%	0.00%	5	-	362	\$ 361.81
Totals					94	544	362	\$ 24,401.93

Survivor's Share \$ 67.41
 Rate of Return 11.85%

Table 1

Actuaries Table

Year	Age	Mortality	Adjustment Factor	Lapse Rate	Deaths	Lapses	Survivors	Survivor Contribution*
0							1000	\$ 3,207.14
1	30	8.42%	50%	10.00%	4	100	896	\$ 2,710.30
2	31	8.57%	60%	8.50%	5	76	815	\$ 2,326.41
3	32	8.74%	70%	7.50%	5	61	749	\$ 2,016.69
4	33	8.91%	80%	6.50%	5	49	695	\$ 1,765.31
5	34	9.09%	80%	6.00%	5	42	648	\$ 1,553.35
6	35	9.28%	80%	5.50%	5	36	608	\$ 1,373.95
7	36	9.48%	80%	5.00%	5	30	573	\$ 1,221.54
8	37	9.68%	80%	4.80%	4	27	541	\$ 1,088.16
9	38	9.90%	80%	4.50%	4	24	512	\$ 972.24
10	39	10.13%	80%	4.30%	4	22	486	\$ 870.33
11	40	10.36%	80%	4.00%	4	19	463	\$ 781.42
12	41	10.61%	80%	3.50%	4	16	442	\$ 705.13
13	42	10.89%	80%	3.00%	4	13	425	\$ 639.47
14	43	1.25%	80%	2.50%	0	11	414	\$ 587.58
15	44	1.69%	80%	2.00%	1	8	405	\$ 542.49
16	45	12.21%	80%	1.50%	4	6	395	\$ 499.11
17	46	12.83%	80%	1.00%	4	4	387	\$ 461.31
18	47	13.51%	80%	0.05%	4	0	383	\$ 430.28
19	48	14.25%	80%	0.00%	4	-	379	\$ 401.30
20	49	15.06%	80%	0.00%	5	-	374	\$ 374.02
Totals					80	546	362	\$ 24,527.53

Survivor's Share \$ 67.76
 Rate of Return 11.94%

Table 2

Simulation

Based on Spectator Insurance Yearbook Data

*Mean policy \$3,000 life insurance

Sheppard Homans Table

Based on Interest Rate Observations

*At \$12.00 contribution (avg returns)

Year	Age	Mortality	Adjustmen	Lapse Rate	Deaths	Lapses	Survivors	Rate of Interest	Survivor Contribution*
0							1000	6.00%	\$ 38,485.63
1	30	8.95%	50%	10.00%	4	100	896	6.00%	\$ 32,514.00
2	31	9.09%	60%	8.50%	5	76	815	6.00%	\$ 27,899.04
3	32	9.23%	70%	7.50%	5	61	748	6.00%	\$ 24,175.80
4	33	9.41%	80%	6.50%	6	49	694	6.00%	\$ 21,153.19
5	34	9.59%	80%	6.00%	5	42	647	6.00%	\$ 18,605.39
6	35	9.79%	80%	5.50%	5	36	606	5.42%	\$ 15,233.17
7	36	10.01%	80%	5.00%	5	30	571	5.39%	\$ 13,561.50
8	37	10.25%	80%	4.80%	5	27	539	5.47%	\$ 12,255.83
9	38	10.52%	80%	4.50%	5	24	510	5.43%	\$ 10,953.70
10	39	10.83%	80%	4.30%	4	22	484	5.27%	\$ 9,704.27
11	40	11.16%	80%	4.00%	4	19	460	5.10%	\$ 8,640.81
12	41	11.56%	80%	3.50%	4	16	440	5.36%	\$ 8,014.59
13	42	12.00%	80%	3.00%	4	13	422	5.06%	\$ 7,161.26
14	43	12.51%	80%	2.50%	4	11	408	5.09%	\$ 6,589.00
15	44	13.11%	80%	2.00%	4	8	395	4.86%	\$ 6,012.48
16	45	13.78%	80%	1.50%	4	6	385	4.99%	\$ 5,612.35
17	46	14.54%	80%	1.00%	4	4	377	4.88%	\$ 5,213.54
18	47	15.39%	80%	0.05%	5	0	372	4.89%	\$ 4,908.21
19	48	16.30%	80%	0.00%	5	-	367	5.46%	\$ 4,643.46
20	49	17.40%	80%	0.00%	5	-	362	4.67%	\$ 4,341.77
Totals					94	544	362		\$ 285,679.00

Survivor's Share

\$

789.17

Rate of Return

11.44%

Table 3

*Mean policy at \$3,000 insurance

*At \$12.00 contribution (avg returns)

Actuaries Table

Based on Interest Rate Observations

Year	Age	Mortality	Adjustmen	Lapse Rate	Deaths	Lapses	Survivors	Interest Rate	Survivor Contribution
0							1000	6.00%	\$ 38,485.63
1	30	8.42%	50%	10.00%	4	100	896	6.00%	\$ 32,523.62
2	31	8.57%	60%	8.50%	5	76	815	6.00%	\$ 27,916.87
3	32	8.74%	70%	7.50%	5	61	749	6.00%	\$ 24,200.29
4	33	8.91%	80%	6.50%	5	49	695	6.00%	\$ 21,183.74
5	34	9.09%	80%	6.00%	5	42	648	6.00%	\$ 18,640.26
6	35	9.28%	80%	5.50%	5	36	608	5.42%	\$ 15,268.37
7	36	9.48%	80%	5.00%	5	30	573	5.39%	\$ 13,598.95
8	37	9.68%	80%	4.80%	4	27	541	5.47%	\$ 12,295.61
9	38	9.90%	80%	4.50%	4	24	512	5.43%	\$ 10,995.01
10	39	10.13%	80%	4.30%	4	22	486	5.27%	\$ 9,746.63
11	40	10.36%	80%	4.00%	4	19	463	5.10%	\$ 8,684.36
12	41	10.61%	80%	3.50%	4	16	442	5.36%	\$ 8,061.39
13	42	10.89%	80%	3.00%	4	13	425	5.06%	\$ 7,209.74
14	43	1.25%	80%	2.50%	0	11	414	5.09%	\$ 6,695.53
15	44	1.69%	80%	2.00%	1	8	405	4.86%	\$ 6,167.26
16	45	12.21%	80%	1.50%	4	6	395	4.99%	\$ 5,764.25
17	46	12.83%	80%	1.00%	4	4	387	4.88%	\$ 5,362.14
18	47	13.51%	80%	0.05%	4	0	383	4.89%	\$ 5,055.79
19	48	14.25%	80%	0.00%	4	-	379	5.46%	\$ 4,791.04
20	49	15.06%	80%	0.00%	5	-	374	4.67%	\$ 4,488.25
Totals					80	546	362		\$ 287,134.72

Survivor's Share \$ 793.19
 Rate of Return 11.52%

Table 4

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