University of Nevada, Reno

The Effect of Demographic Change on Life Insurance Trends in Japan

A thesis submitted in partial fulfillment
of the requirements for the degree of

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by

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Abstract

Birthrates in Japan have been declining and the aging rate has been increasing. Since the 1990s, the rate of insurance purchases has declined. My thesis examines the relationship between birthrate, aging, and life insurance preferences. I propose that there is a causative relationship between increasing aging rates, decreasing birthrate and decreasing premium payment, and decreasing coverage amount. As birthrate declines there are fewer beneficiary children, thus less need for life insurance and fewer purchases of those products. Using data analysis, I determined that there is a relationship between marriage rates and life insurance purchases, contrasting the original theory that birthrates are the main impacting variable. As birthrate decreases, the number of children who take care of the elderly is less, thus the elderly are more reliant on their spouses, and life insurance is purchased as a protection for spouses more than for children. Marriage rate has a greater impact on life insurance purchase than birthrate. As marriage rate decreases, premium payments and coverage amount decrease. These demographic trends are not unique to Japan; the United States will soon see the same impacts. Future study is needed to determine other influencing factors and the degree of change as life insurance products change to include disability and retirement coverages.

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Introduction

The way society supports the elderly changes as demographic and sociocultural norms change over time; industries have developed to meet the elderly's expanding financial needs. There comes a time in every person's life when he or she will stop working, due to age, illness, or other unforeseen circumstances. Pension and social security schemes are ways to ensure that those who have ceased working can continue to live. Pension and social insurance structures rely on the contribution of younger generations to support the older population. The post-war baby boom seen in industrialized countries has had a ripple effect on pension and social security schemes around the world, especially when coupled with the declining birth rate seen in the same nations beginning in the mid-late 1980s (Date, Y., & Shimizutani, S., 2007). Analyzing the changing population demographics is instrumental to both private and public retirement planning. Japan and most western nations are facing declining birthrates and increasing life expectancy. In 2003, Japan's total fertility rate hit record lows of 1.29 percent (Date, Y., & Shimizutani, S., 2007). In 2006, 20.6 percent of the population was over 65 and by 2025 is projected to increase to 28.7 percent (Horioka, C. Y., SuzukiI, W., & Hatta, T. (2007). Japan is not unique in this overall trend. Many Northern European countries are already seeing the effects of a declining birthrate on the macroeconomy (Date, Y., & Shimizutani, S., 2007). Even China, the most populous nation, is facing this issue (Komine, T., & Kabe, S., 2009). The increasing average age of the population and the declining birthrate is a universal trend in developed countries, meaning that an issue faced today in Japan is an issue for the US tomorrow.

Japan is an excellent country to study. Japan's birthrate is well documented and immigration is limited, making Japan an appropriate model for the relationship between birthrate and retirement. Economists, such as Masaaki Kawagoe and Yusuke Date (Date, Y., &

Shimizutani, S., 2007) (Komine, T., & Kabe, S., 2009), have studied the correlation between birthrate and the macroeconomy issue extensively. However, none has focused on birthrate's impact on private retirement products or life insurance. This thesis discusses the relationship between birth rate and retirement planning using pension usage, savings rate, and life insurance as metrics for retirement planning. This thesis will postulate that a declining birthrate in combination with an increasing life expectancy has changed the need for life insurance and retirement planning in Japanese society. Logically, if a person's life is longer, then retirement is longer and there is a greater need for supplemental income. As the average age of the population increases, the issue of end-of-career and estate planning becomes more important. Additionally, with a declining birthrate persons are less likely to be able to depend on his or her child during his or her longer retirement. This would suggest that retirement product sales would increase. If said person is less likely to have a child, then he or she is also less likely to have a dependent, and thus a beneficiary of a life insurance policy. In conclusion, this thesis will predict retirement product sales to increase, and life insurance to decrease.

Using demographic and sales data, this thesis formulates a mathematical model that can be applied to future data as a prediction. This model will be compared to the original prediction that life insurance sales will decrease and retirement product sales will increase, and depending on the results of that analysis, will indicate whether that prediction is valid. Forecasts and governmental policy recommendations will be made based on the findings of the model.

Historical Overview

History of the family structure

Much of modern Japanese law and structure was developed during reconstruction after World War Two (Takada, 2016). However, the fundamental ideals of Japanese society—respect for elders, family relationships and group dependence—originate from Japan's ancient agrarian history. Human settlement started in Japan sometime before 10,000 B.C. Much like the original population of the Americas, ancient natives of Japan most likely travelled by foot from other parts of Asia by a land bridge which has since been covered by the modern day Japan Sea (Warley, 2000).

The Yayoi period (300 B.C.-A.D.300) began with the cultivation of rice in large paddies. Social classes developed between those who farmed and those who owned land. Classes were further stratified by the use of bronze and iron in warfare (Warley, 2000). It was during this time that the system of *ie* (家) was developed. *Ie* literally means house, although it refers to the household, family, and ancestral line (Davies & Osamu, 2002). *Ie* is similar to Chinese ideas of filial piety because of early Chinese and Japanese interactions. In the Heian period (794-1185 AD), Japan sent students to China and many cultural ideals were transferred, including Filial piety and Buddhism. Filial piety was modified by the Japanese into *ie* (Francis, 1971).

The basis of *ie* is the worship of ancestors and the respect for elders. In Buddhism (which spread to Japan from China) ancestors become Buddha once deceased, meaning that they have achieved an ideal state and are revered. *Ie* also establishes a patriarchal family system. The senior male had control of inheritance, land-ownership, and marriages. The patriarch was given special respect in the household. *Ie* was especially strong in the homes of Samurai, although still prevalent in farming families (Davies & Osamu, 2002).

Principles of *ie* were enforced by law until after Japan's constitution was changed. The patriarch had to approve of marriages, divorces, adoptions, and places of residence. After WWII, this was abolished, and couples were given the right to marry, divorce, and other such matters. This also marked the rise of 'nuclear families' and independent living (Davies & Osamu, 2002). While the Japanese still honor and respect the elderly and family unit, the caretaking of the elderly has changed. The elderly have stopped living in the home and serving as the primary source of child care.

Changing women's roles

Japan's declining birthrate is due, in part, to cultural expectations for women. Michael Zielenziger, in his book *Shutting out the Sun: How Japan Created Its Own Lost Generation* (2007), analyzed the sources of various social issues existing in Japan today. He specifically studied the cultural evolution of women. In the Post WWII reconstruction era, limited factory and industrial work was predominantly filled by men. Women stayed in the home as housewives; a similar phenomenon occurred in the United States. Women became dependent on men for their livelihoods, and only contributed to domestic duties. This ideal of women's roles has not changed to the same extent as it has in the United States, and these gender roles are still the norm today. While more career opportunities have opened up in Japan, the feeling that a woman must choose between family and career is still prevalent (Zielenziger, 2007).

To address this problem, the Japanese government has started a marketing initiative to change the image of stay-at-home dads and encourage equal parenting called the *Ikumen Project.* The *Ikumen Project* is still in its infancy, and is yet to be determined if this project is effective (Mizukoshi, 2016). In Japan, hiring professional childcare is stigmatized, and choices of

domestic help are limited to the family. For many women, the burden of motherhood is too high. At the turn of the century, a new term was coined to describe career women in their twenties and thirties who chose to live with their parents and not start their own families (Zielenziger, 2007). This term, *parasaito* (パラサイト), is a derivation of the English "parasite." (Zielenziger, 2007). In 2007 The Health Ministry estimated that 2.5 million women ages 25 to 39 fit this description. This amounts to 20 percent of all women in this age group. More than half (54 percent) have never been brides, double of what was expected in the 1980s (Zielenziger, 2007). These women decided to pursue economic freedom, and thus are not having families, decreasing the birthrate. Even women who decide to get married are marrying later in life and having fewer or no children at all.

Many couples are facing higher child-rearing costs because of increases in housing requirements and tuition (Zielenziger, 2007). Besides these real costs, couples are facing higher opportunity costs. As more women are working and being paid higher wage, the couples are giving up on more potential income if the woman was to leave the workforce. Most Japanese companies have a seniority-based wage system, meaning that an employee is paid more the longer he or she has worked at the company. Even if a woman were to leave the workforce and return later, she would lose promotions (Date, Y., & Shimizutani, S., 2007). These factors make having children harder, and impact birthrate.

Corporate and legal history

The change of family structure is parallel to a change in corporate structure. The first life insurance company Meiji Life was established in 1881. Teikoku Life was established in 1888 and Nippon Life was established in 1889. Daiichi Life, the first mutual company, was

established in 1902. (Matsumoto, 2015). Corporate retirement benefits first began during the 1920s. World War I industrialization led to rapid business growth, and expanded the need for labor. Skilled labor was scarce, so corporations developed corporate-funded apprenticeship firms. However, worker retention was low. After a worker completed a training program, other companies would scout the skilled worker by offering higher pay. Companies also included merit-based performance incentives. To increase worker retention and recoup the initial investment in human capital, companies began offering seniority based pay and the promise of a retirement allowance. Retirement allowances were originally only for a percentage of highly skilled workers, and based off of length of service to the company. Retirement allowances were the earliest form of corporate retirement pensions (Horiai, 2011).

By the 1930s, most large corporations had begun expanding retirement benefits to the entire workforce. During this time however, Japan was entering into an economic slump. The 1923 Kanto Great Earthquake, 1926 Financial Crisis, and the Great Depression (1929-31). Companies could not afford to sustain a large labor pool, let alone their benefits. Fear of major lay-offs drove the Japanese Government to intervene The Japanese Government and labor unions forced corporations to prevent layoffs of regular full time employees. Companies reacted by using part-time employees as a buffer between regular employees and economic downturns. Part-time employees were not given retirement benefits or invested in to the same extent as regular employees (Horiai, 2011).

In 1932, the first conflict of WWII began in China ("World War II in the Pacific."). In 1932, the Employment Insurance Law was enacted, mandating that companies create a retirement allowance fund. Companies were given discretion to set the amount of pay-out based on the employee's length of service, and temporary workers were still essentially excluded

(Horiai, 2011). By 1937, full scale war had begun, and in 1940, Japan joined the Axis powers. The United States imposed sanctions on the already struggling Japanese economy. These sanctions pressured Japan to bomb Pearl Harbor in 1941, leading to the United States full entry into the war. Across the Pacific, battles broke out which had been successful for Japan until the Battle of Midway in 1942 where Japan was forced to retreat. After repeat defeats, the United States liberated the Philippines in 1944. Bases in the Philippines allowed the United States to be close enough to launch attacks on Japan itself. In 1945, both atomic bombs were dropped on Japan and the war quickly ended for Japan ("World War II in the Pacific."). The economy and the entire nation were decimated.

After Japan was defeat in WWII, the country experienced a number of drastic changes under American occupation. The most apparent of these changes was the constitution. Article 25 states:

> *"(1) All people shall have the right to maintain the minimum standards of wholesome and cultured living. (2) The State must make efforts to promote and expand social welfare, social security and public health services to cover every aspect of the life of the people"* ("World War II in the Pacific.").

This constitutional change forced the government to take responsibility for social welfare, which it had only minimally provided for in the past (Shionoya, 2000). In 1946, both the Emergency Life Assistance and the Living Protection Law were enacted, providing public assistance to anyone under a certain standard of living (Schaede and Nemoto, 2006). WWII also imposed burdens on life insurance companies because of increased deaths, and benefit payout. Premium income decreased due to low sales of new insurance, and real operating costs increased due to inflation. (Matsumoto, 2015). In 1946 the Financial Institutions' Reconstruction and

Readjustment Act required life insurance Companies to separate established policies and new business, and conduct post-war readjustments only in new business accounts, in an effort to honor pre-war policies (Matsumoto, 2015). In 1947, the promotional campaign "the Month of Life Insurance" was held for the first time, and has since repeated every November. This annual event has had a key role in market penetration. In 1948, the Act pertaining to regulation on insurance solicitation was enacted to prevent illegal insurance solicitation (Matsumoto, 2015).

In 1949, The Trade Union Law was enacted officially allowing for the worker's right to collectively bargain (Horiai, 2011). Unions were instrumental in preventing major lay-offs in the 1930s, and with this act, workers were given more power. The Japanese quickly adopted labor unions and the percentage of workers who were members of unions rose 60 percent by the end of 1949. Unions addressed issues of low wages, poor working conditions, employment security and demanded the participation in management (Takada, 1999). Because companies were in turmoil from economic disorder, unions were able to achieve many of their demands. Workers secured increased wages, welfare benefits, 'life-time' employment (as will be discussed in literature review), and wages based purely on seniority. Companies were struggling to provide all of the labor union's demands.

In 1949 and 1950, recessions forced many companies to consider bankruptcy or denying benefits. Workers held strikes, resulting in violent labor disputes. Ultimately, companies prevailed by using employer networks to relocate employees, reducing hours, laying-off part-time employees and avoiding new-hires (Horiai, 2011).

In 1958, Universal Health Insurance was enacted. In 1959, Universal Pension system was enacted. Today, pension systems are three-tiered. This law established the first tier or basic public pension. The basic pension is a mandatory flat fee for all employees over a certain

income, between the ages 20 and 60. As of 1998, only 1.4 percent of eligible employees did not participate, making this an almost perfect universal plan. To receive benefits from the basic pension requires a minimum of 25 years of this premium payment. This act laid the foundation for Japan's modern pension system (Shionoya, 2000). By 1958, the insurance industry had mostly recovered from the war (Matsumoto, 2015).

The 1960s and early 1970s were marked by high economic growth (Horiai, 2011). Life insurance industry continued this growth until the mid-1990s. Increasing land prices and stock prices led to high expected interest rates and the payment of high dividends (Matsumoto, 2015). Many of the labor unions former demands were finally able to be carried out because of corporate profitability. Age-based promotions, mandatory retirement at age 55, and 'life-time' employment became the norm. Mandatory retirement was concerning for the Japanese Government, because many retirees still needed additional income between the age 55 and 60 (when pensions were paid out). In 1971, the Law Concerning Stabilization of Employment of Older Persons was passed, obligating employers to increase the mandatory retirement age from 55 to 60. The government also established Silver Human Resource Centers, programs that help older people find employment (Horiai, 2011).

In the mid-1970s, the Oil Crisis threatened companies' ability to main labor pools and benefits once again. Again, companies reduced hours, new-hires, temporary employees, and bonuses and transferred workers to other positions or companies using corporate networks. To prevent future mass lay-offs, the government recognized these corporate actions in legislation. In 1977, The National Project for Promoting Employment Stability was established. This project encouraged these corporate practices in an effort to prevent lay-offs, essentially acknowledging prior corporate policies into governmental policies (Horiai, 2011).

The 1980s were met with unprecedented economic growth in the form of a bubble. Whole industries expanded rapidly, leading to labor shortages. In this time, direct hire of college graduates was particularly high. In the 1990s, the bubble collapsed and Japan fell into a recession that is still the target of stimulus policies today. After the mid-1990s, the economic bubble collapsed (Horiai, 2011). Households were forced to cut expenses. Decreased stock prices, unexpectedly low returns, bad loans and low interest rates forced some companies to declare bankruptcy. Seven life insurers failed during this period (Matsumoto, 2015). Through this recession however, companies managed to maintain labor levels. In 1994, the Law Concerning the Stability of Employment Opportunities for Older Persons (originally enacted in 1971) was amended to announce the projected increase in the pension benefit age to 65 and this increase was fully implemented seven years later (Horiai, 2011). In 1996, the Insurance Business Act was revised to allow non-life insurers to enter the life insurance market through subsidiaries. This act also developed a bankruptcy resolution system. Since 2005, consumer focus has shifted from death coverage to living coverage, such as medical or retirement securities (Shionoya, 2000). Insurance companies have shifted product offerings to match consumer needs. This brings our history to modern day.

In-depth explanation of the modern day 3-tier pension system in Japan

As previously mentioned, the pension system in Japan is three-tiered. The basic, universal, tier established in 1969. The basic pension covers all residents of Japan (including foreigners). Every person between the ages 20 and 60, including students and homemakers, above a minimum income pays a flat fee into the system. Every person over the age 60 who has paid into the system for 25 years or more qualifies for pension benefits. The second tier is Employees' Pension Insurance. All companies with more than 5 employees are required pay in to the pension system. Employees and employers both pay in 8.68 percent of the employees'

salary, with a set maximum. The third-tier is corporate pensions and retirement allowance. The third-tier is optional for employers, however as of 1997, 52 percent of companies provided some sort of retirement package beyond the mandatory Employees' Pension Insurance. The most common forms of retirement packages are a lump-sum payment at the time of retirement, or a life-long payout system. This tier is entirely based on corporate policy (Shionoya, 2000). In total, these three tiers make up the pension system for retired persons in Japan. This, private savings, investment and family support, is the entirety of an elderly person's income.

In summary, Japan has a long standing pension system and an expectation that employees will retire at 65. In terms of this thesis, the Japanese pension system is partially based on the number of people who are paying into the system. As birthrate decreases, there are less people who will eventually pay into the system. As the aging rate increases, the proportion of elderly (aged 65 or more) to the entire population increases, thus there are more retirees receiving payout. In total, the pension system could become over-burdened and individuals may purchase privately offered retirement products to offset this possibility. Life insurance functions as one such product.

Literature review

The effect of birthrate on the economy, production, and Gross Domestic Product (GDP) in Japan is well studied by such researchers as Takao Komine, Masaaki Kawagoe, and Yusuke Date. While some European countries have experienced a declining birthrate, European rates have begun to recover. Japan is expected to continue to decline for the next 20 years (Date, Y., & Shimizutani, S., 2007). According to Takao Komine and Shigesaburo Kabe, Japan is already at an advanced stage of this birthrate decline, and other Asian countries such as China, South Korea, Thailand, and Singapore will soon follow. Japan's birthrate is so low that it no longer allows replacement of the population (Komine, T., & Kabe, S., 2009). Japan's birthrate fell to a low of 1.29 in 2003 (Date, Y., & Shimizutani, S., 2007) and Japan's population peaked in 2004 at 128 million people and has since been decreasing. In comparison, China is expected to experience a negative birthrate, given no change to current trends, between 2020-2025 (Komine, T., & Kabe, S., 2009).

Birthrate has a major impact on GDP. The economy can be modeled in one of its most basic forms as a function of labor, capital, and productivity (also known as technology). The labor force is made of people born in a country and people who migrate to a country. Thus, if birthrate is low and migration is limited, as is the case in Japan, the labor force decreases and we can expect a decrease in GDP, holding all other factors constant. In a study conducted by Charles Horioka, Suzuki Wataru, and Tatsuo Hatta, it is predicted that Japan's GDP will stop growing sometime between 2040-2050. Due to increasing life expectancy and average age, expected savings rates will decrease and there will be increased burden on pensions and health care. (Horioka et al., 2007)

Japan's 3-tiered pension system is instrumental to Japan's economy. Employer provided pensions are so important because of the work culture in Japan. The work culture Japan is unique from any other country because of the prevalence of Lifetime employment. Lifetime employment is the practice of hiring employees immediately post-graduation and continuing employment until retirement age. While there is difficulty estimating the exact percentage of employees who fall into this category because survey data is restricted by the Japanese government, the best estimate is that employees of the lifetime employment institution in Japan account for roughly 30 to 35 percent of the employed population (Higo, 2010). Lifetime employment is not an explicit contract. Much like the United States, the Japanese Labor Standard Law mandates that non-employees are able to give two-week's notice at any point of leaving a job, and companies are mandated to pay thirty days wages after firing an employee. The institution of lifetimes employment is supported by a number of human resource practices. Many companies frequently hire new graduates, and only hire during graduation season. Additionally, 40 percent companies explicitly set written upper age limits on new hires. Other companies also set implicit age caps.

After hiring, the majority of corporate Japanese wage and promotion systems are seniority-based. The company views the employee as an investment in human capital, and expects that recent graduate have little to no prior job experience. The longer an employee's tenure, the greater the companies' investment and the greater value of the worker. New hires have low wages, but are insulated by the social contract of job security. However, companies are unable to continually promote workers past a certain age as worker productivity decreases. Approximately 95.3 present of companies have mandatory retirement policies. 86.6 percent of these companies set a mandatory retirement age of 60. However, in reality because of increasing

life expectancy, dimensioning labor force, and post-retirement financial necessity, many retirees rejoin the labor force (Higo, 2010). Japan's labor force participation rate of the elderly is one of the highest for this reason. Of people between the age 60 and 64, 73 percent of males and 43 percent of females were employed in 2006 (Yamada, 1987).

In 2006, a law was passed mandating that Japanese companies either abolish mandatory retirement policies, set the mandatory retirement age at 65, or create corporate policies to maintain some form of employment for workers until age 65. The majority of employers chose to rehire employees after the mandatory retirement age. However, he or she is allowed to change working conditions such a wage, responsibilities, and hours. Most of these rehires are rehired as part-time workers with lower wages and responsibilities.

The financial necessity to remain in the workforce is driven by the public pension system. As discussed previously, the first tier of Japan's pension system is the basic, or National Pension Plan. This is a pay-as-you-go system. Approximately one-third of funds are provided by the private Social Insurance Agency and the remaining funds come from a flat contribution of all adults ages 20 to 59, including those not in the labor force (Higo, 2010). In 1994, legislation was passed to gradually increase the pension age from 60 to 65 (Horiai, 2011). The eligibility age to collect this pension is 65, meaning that for most workers under this pension system, there is an income gap between the company mandated retirement age of 60 and pension eligibility at 65 (Higo, 2010).

The second pension system is Employees' Pension Insurance. Employees' Pension Insurance is a payroll tax split between employers and employees. Since this is company specific, the eligibility age is set at corporate retirement age which in most cases is age 60. This system prevents a gap in income, although workers are still not able to collect the National

Pension Plan until age 65. After age 65, the combination of both benefits accounts for an average of 60 percent of pre-retirement income (Higo, 2010). Neither plan incentivizes employees to retire early, and even after reaching full benefits, retirees may have additional financial needs.

As Japan's birthrate declines and life expectancy increases, the percent of elderly increases. This means that, if contributions per person were to remain the same, total contributions would decrease and total payout increases. Without any change, the pool of pension money would run out. Both laws passed in 1994 and 2006 were in effort to prevent this by decreasing the number of elderly receiving payout. The public pension system has been continuously reformed to account for the declining population. Researchers Charles Horioka, Wataru Suzuki, and Tatsuo Hatta developed a model know as OSU II to reflect the inequity of pension benefits and contributions after the 2004 pensions reform. This model is similar to model created by the Ministry of Health, Labor and Welfare (MHLW) which does not account for the 2004 reforms, but otherwise is not publically available. The MHLW model "expresses the view that the ultimate contribution rate of 21.6 percent calculated in 1999 would have to be increased to 24.8 percent" because of changes in population as of 2002. The OSU II model calculates that if the contribution rate were raise to 24.8 percent the pension system would not be exhausted until 2100, taking in consideration the effect of the 2004 pension reforms and current predictions on population. (Horioka et al., 2010)

This is further studied by Midori Wakabayashi in her publication on the relationship between social security and retirement savings. Wakabayashi found that there was a high significant relationship between amount of pension retirement payments and private savings. In other words, she found that people began to supplement their income from social security with investments in private savings. Wakabayashi concluded that "people take account of their

expectations concerning both social security benefits and retirement payments when saving for life after retirement" (p. 131-159). This suggests that Japanese consumers are cognizant of their finances and the savings rate will be impacted by consumer's predictions of the future.

In conclusion, birthrate is expected to continue to decrease. Japan's declining birthrate "may result in a greater burden per person regarding social security and have a negative effect on Japan's long-term economic performance" (Date, Y., & Shimizutani, S., 2007). Due to modern medicine, life expectancy is also expected to increase. Labor force will decrease and the retired population will increase. In total, as birthrate decreases, there are fewer workers paying into the system. As aging rate increases, there are more retirees receiving benefits. The pension system will become more burdened as the percentage of retirees to active workers increases. Public or employer pension funds may become overburdened at the current rate, and the need for private retirement income supplements will increase. Workers are shown to plan ahead for their retirement, and there is an intuitional mandatory retirement age. The combination of these factors means that the majority of Japanese people will retire and are likely to purchase products which would supplement their income. Life insurance is one such supplemental product, as it is a form of savings. Thus, as the pension system is overburdened (due to demographic changes), Japanese people are more likely to purchase retirement products, including life insurance.

Theory explanation and expected results

In Japan, three facts drive insurance spending: birthrates are decreasing (see Fig. 1); life expectancy is increasing (Fig. 2); and the population is aging (Fig. 3). As birthrates decrease, there are fewer children or descendants per household, thus individuals are less likely to have a child or a dependent. The main functions of life insurance is to replace the some of the income of the main breadwinner of a family in case of death, especially when families have young children. Thus if a couple do not have children and are both able to work, there is less need for life insurance. A decreased birthrate means a decreased number of potential beneficiary offspring. This "beneficiary child" effect implies the demand for life insurance to decrease as the birth rate decreases.

Fig. 1 shows birthrate trends since 1960. If the theory is correct, and birthrate is decreasing as the data shows, life insurance purchases are also expected to decrease.

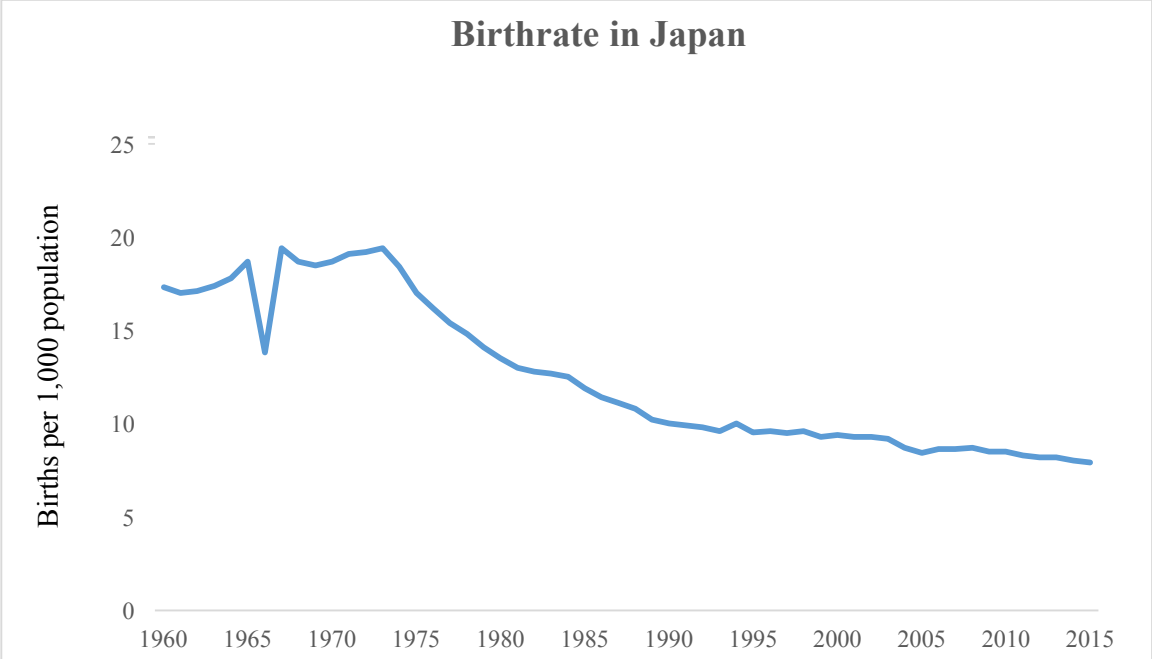


Fig 1.Births per thousand population in Japan 1960 to 2015. Source: Ministry of Internal Affairs and Communications, Statistics Bureau; United Nations Population and Vital Statistics Report

However, spouses can also be listed as beneficiaries on life insurance policies. As birthrate decreases, an individual is less likely to have children who are going to support them post-retirement. An individual can no longer rely on offspring for elderly support after retirement, thus is more dependent upon their spouse. This “beneficiary spouse” effect implies we should expect the demand for life insurance to increase as the birth rate decreases, reducing the impact of the “beneficiary child” effect. Despite this mitigating factor, this thesis theorizes that as birthrates decrease, life insurance purchases also decrease.

Fig. 2 shows average life expectancy in Japan since 1960. As life expectancy increases, as the data shows, there is a longer period of retirement. If the “beneficiary spouse” effect is more prevalent, then as life expectant increases (thus a longer period of retirement and dependency on spouse’s income), insurance is also expected to increase. If the “beneficiary child” effect is more prevalent, increased life expectancy indicates that overall a parent is able to live longer, and there is less possibility that the parent will pass away while the child still needs coverage. This suggests that as life expectancy increases, as the data shows, there is less need for life insurance.

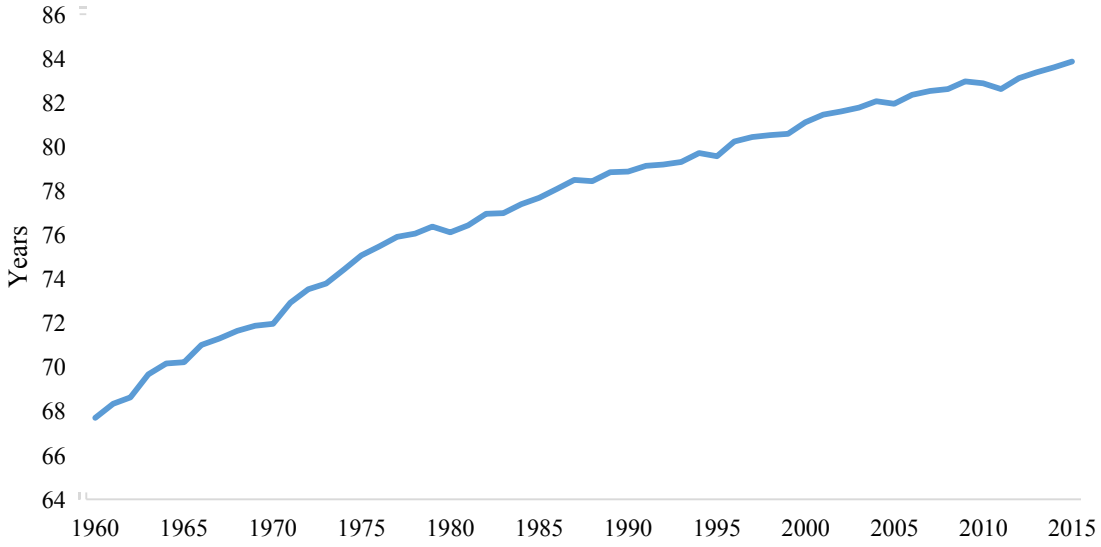


Fig 2. Average life expectancy in Japan in years (Men and Women) from 1960-2015
Source: Ministry of International Affairs and Communications, Satistics Bureau United Nations Population and Vital Statistics Report

The decreasing likelihood of support from children should, however, increase the savings rate and increase the desire to purchase financial products (e.g. annuities) to provide old age support. The savings rate is effected by the aging rate (Fig 3). Also, because of the increase in life expectancy, an individual has a larger period of time between retirement and death; providing an additional reason for placing additional saving into retirement products. It also increases demand for long term care insurance. The aging rate (Fig 3) indicates that a greater proportion of the population is over the age 65; suggesting that demand for long-term care or retirement products is higher.

Instead of paying a premium on a life insurance policy which would not benefit the individual without descendants, and individual may choose to pay for retirement products or long term care insurance.

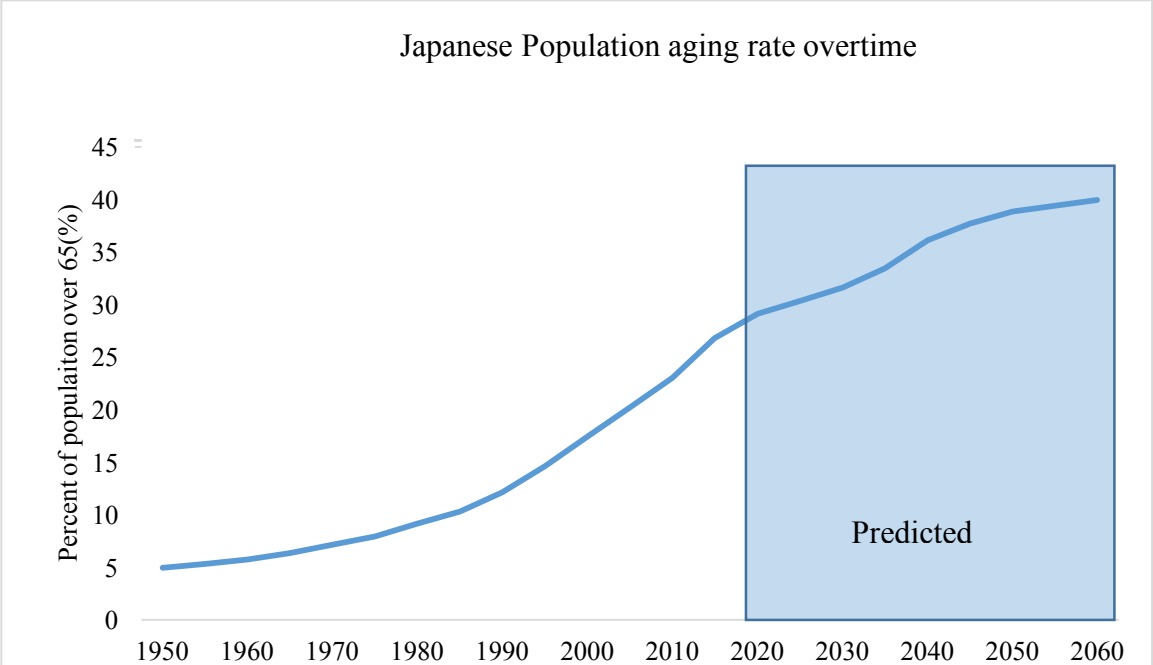


Fig. 3 Populaiton again rate. Percent of the population over 65 from 1950 to predicted 2060. Source: Ministry of International Affairs and Communications, Statistics Burea United Nations Population and Vital Statistics

Summarily, birthrate has a clear decreasing trend, while life expectancy has a clear increasing trend. These changing demographics predict or indicate a decrease in the purchase of life insurance and an increase in the purchase of retirement products.

Current Data

Both annual life insurance premium payment (as a percent of household income spent on life insurance premiums) and coverage amount (average face value of policies per household) show a similar trend. Annual Life Insurance premium payment per household (Fig. 4) peaked in 1997 at 10.1% of total income. While there seems to be a trend, changes are less dramatic than predicted. The total decrease from 1997 (10.1%) to 2012 (8%) is only 2.1 percentage points.

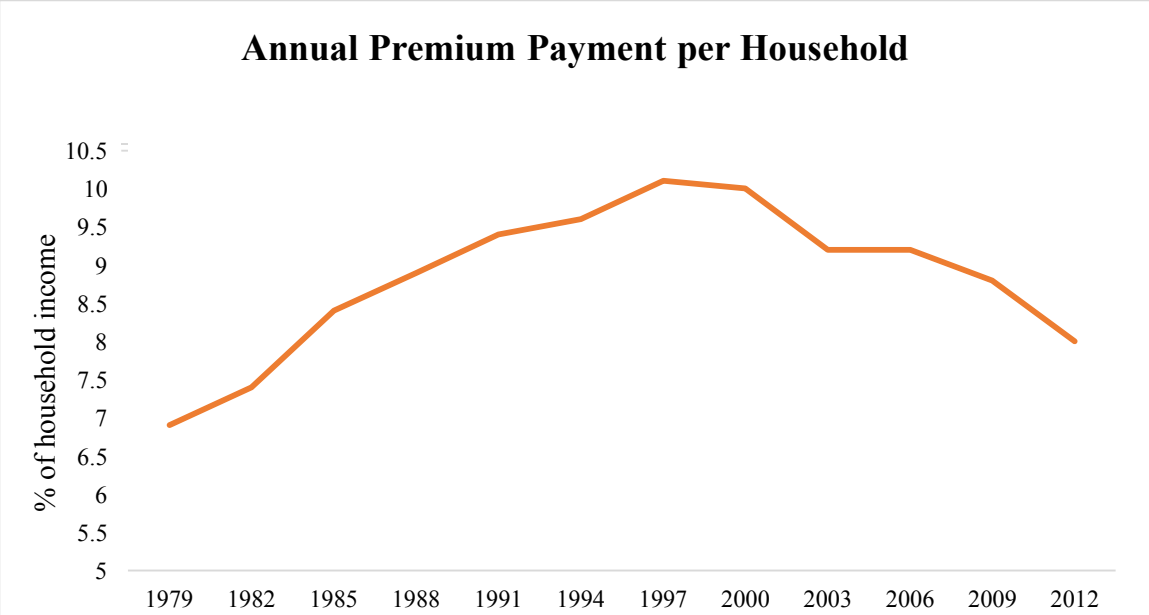


Fig. 4 Annual premium payment as a percent of household income. Source: The Foundation for the Advancement of Life & Insurance Around the World (FALIA)

The data trends of Fig. 4 are reflected in Fig. 5. The average amount of coverage per household (Fig. 5) peaked in 1994 at 46.35 million yen (2015) (385 thousand USD). Both of these graphs show a peak in the 1990s that has since decreased to level of the 1980s.

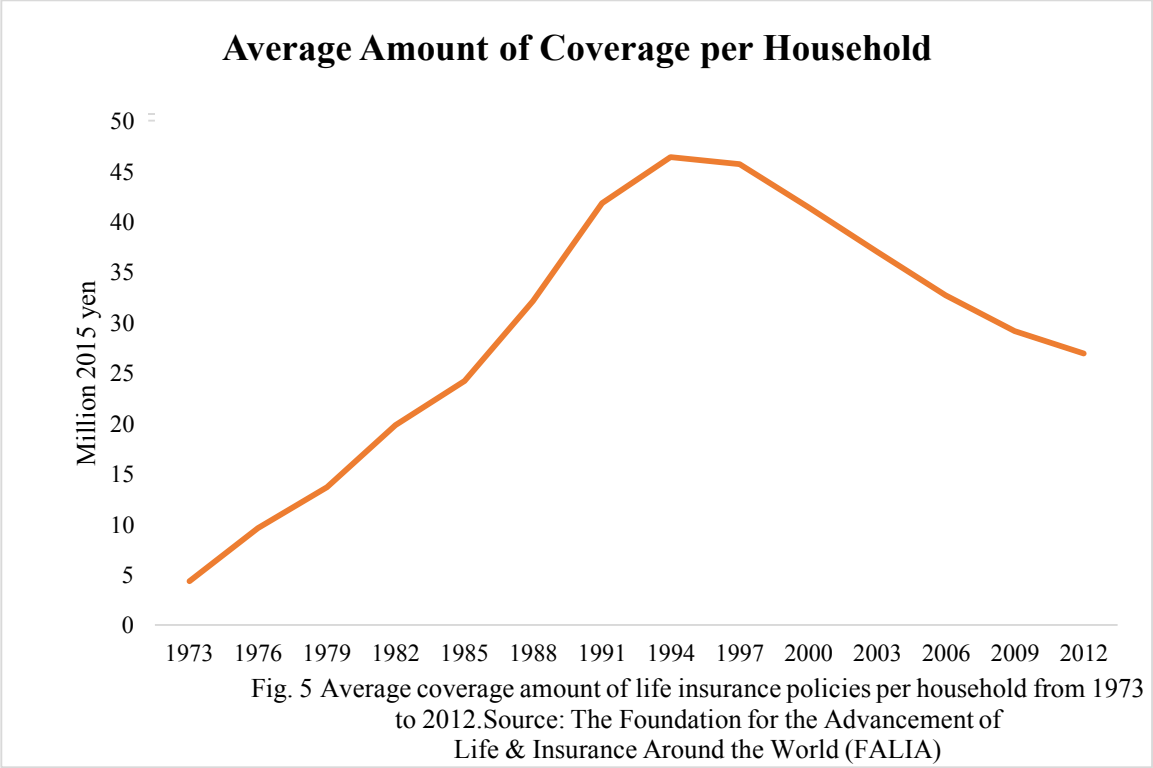


Fig. 5 Average coverage amount of life insurance policies per household from 1973 to 2012.Source: The Foundation for the Advancement of Life & Insurance Around the World (FALIA)

However, ownership rates (Fig. 6) did not follow the same trends. There were moderate fluctuations, but there is no definite peak in the 1990s; suggesting that the number of policy holders did not change, while the number of policies or the coverage amount per policy did change. Consumers may be bound in 10 or 20-year term contracts that prevent them from losing coverage. Consumers may also still elect to purchase life insurance, but at lower amounts. This coverage peak could be a result of the combination of the "beneficiary child" and "beneficiary spouse" effect. Since the insured has fewer or no children, but still has a spouse, the need for some life insurance is still present, but the coverage amount (i.e. the amount the beneficiaries receive upon the insured's death) is lower, thus premiums are also lower. The combination of the "beneficiary spouse" and "beneficiary child" would result in lower coverage amounts and premium payments, while the number of life insurance policies would not change, as the data indicates.

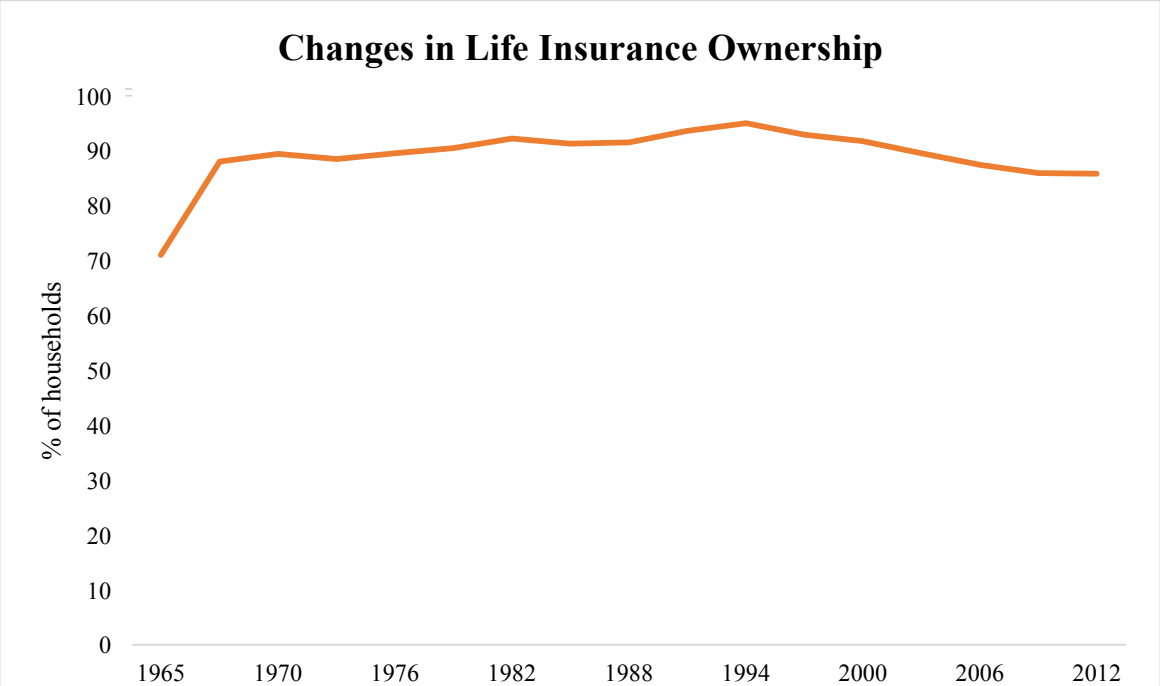


Fig. 6 Change in life insurance ownership rate as a percentage of households that have one or more policies. Source: The Foundation for the Advancement of Life & Insurance Around the World (FALIA)

In summary, both annual life insurance premium payment per household and the average amount of coverage per household peaked in the 1990s, while changes in life insurance ownership rate has been stagnant.

Theory limitations and qualifications

While there seems to be a peaking trend in the 1990s in both premium payments and coverage amount data, there is not a direct correlation between birthrate and insurance payments or ownership. There are a number of other factors that were not considered in the theory, such as economic trends, tax or regulatory environment, savings preference, retirement product qualities, and alternative uses for insurance.

Purchase rates may be affected by overall economic trends. During a recession, households have less income to invest in the future. Major economic episodes may account for some changes in life insurance ownership. However, as fig. 5 demonstrates, Japan fell into a

recession after 1995. This could account for the peak in life insurance premium and coverages in the mid-90s. As shown in the Fig.7, Japan experienced a period growth, ending suddenly in the mid-1990s, and has had up and down cycles since. In the 1980s and 1990s, Japan experienced a period of extreme growth. During this time, households were likely to have excess income, and were optimistic about investing.

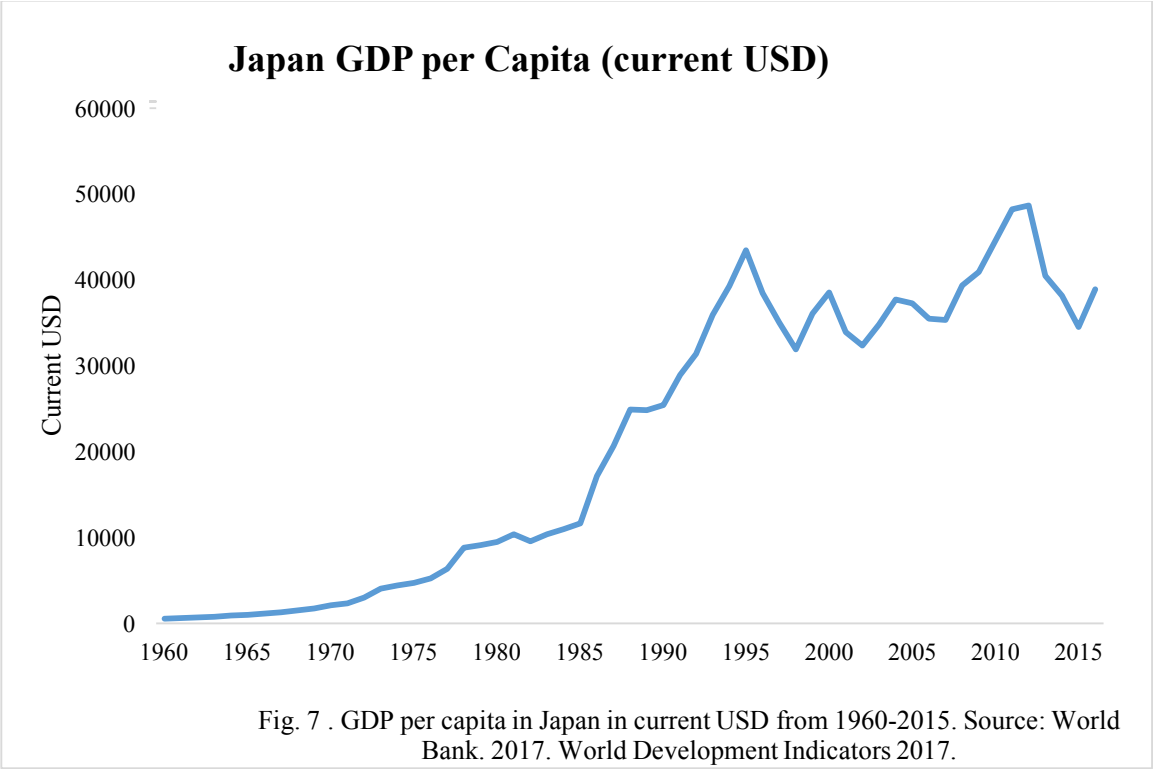


Fig. 7 . GDP per capita in Japan in current USD from 1960-2015. Source: World Bank. 2017. World Development Indicators 2017.

Insurance is a form of saving. By making small payments in the present a policy holder accumulates a large future payoff. As such, insurance purchase rates are affected by the savings ratio and consumer preferences for savings. The savings ratio (Fig. 8) is the percent of income that an individual saves. While the savings ratio is not only impacted by population age, it is the most notable factor for this research. As people get older, there is less need to save; most major purchases (housing, vehicles, education etc.) have already been taken care of. There is also a higher possibility that an individual will not get to reap the benefits of their savings due to disability or death. This decreases the incentive to save. Over time, Japan's savings ratio (Fig. 8)

has decreased from almost 20% in the early 1990s to just above 5%, and is predicted to continue to decrease. This indicates that as consumer's overall savings tendencies have decreased, purchase of savings products (money market accounts, bonds, certificates of deposit etc.) should also decrease. This includes life insurance. A decreased saving ratio indicates a decreased level of life insurance purchases.

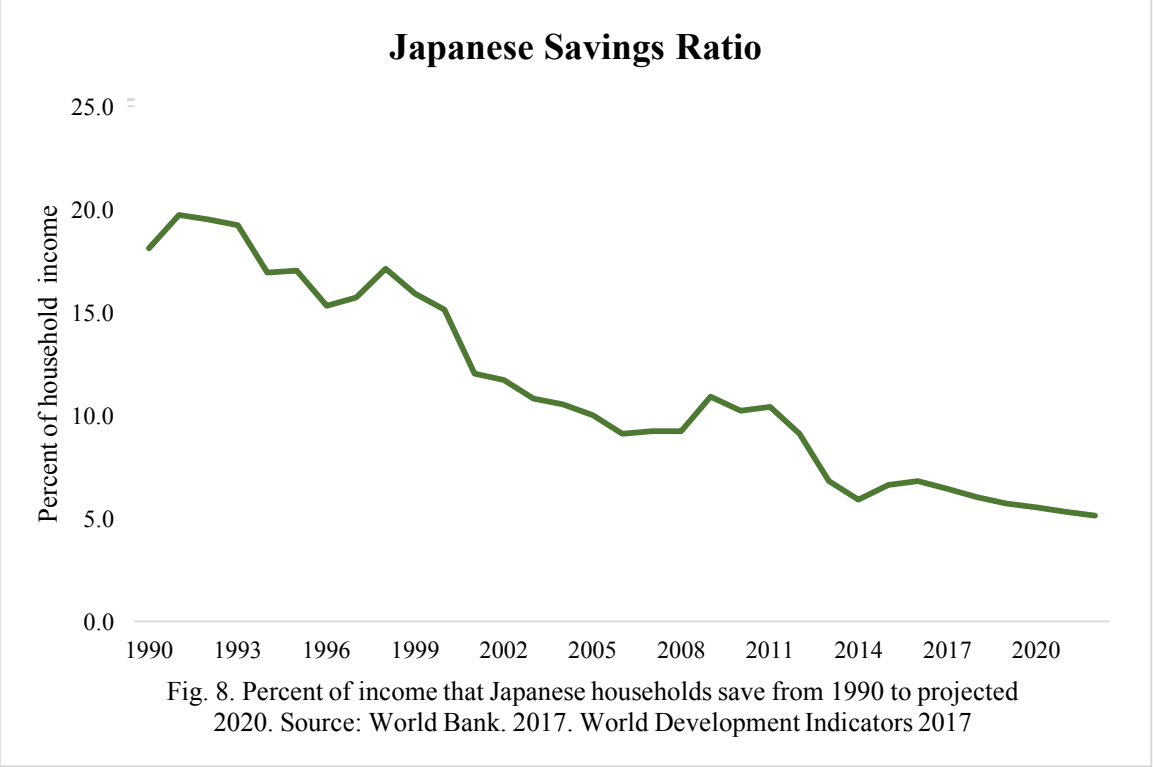


Fig. 8. Percent of income that Japanese households save from 1990 to projected 2020. Source: World Bank. 2017. World Development Indicators 2017

Insurance purchases could also be effected by retirement schemes. Most retirement products and pension systems have provisions for spousal benefits, as life insurance does. If a household considers the public pensions system adequate after the primary breadwinner's death, he or she may not choose to purchase life insurance. Considering that retirement products and life insurance can serve the same purpose for an individual, and that an individual has a limited supply of money, the individual must make a choice between them. Retirement products and insurance purchases theoretically have an inverse relationship. Purchase of retirement products is

also mitigated by the perceived quality of social protections and public pensions. If an individual perceives the government minimum pension to be adequate, purchasing additional retirement products or life insurance policies would seem unnecessary. However, if the public pension system is perceived as inadequate, life insurance sales would increase. Legislative changes in pension regulations and retirement policies may impact consumer perception. Citizens may also realize that the proportion of retirees to work force is increasing. If citizens believe that the public pension structure is over-burdened, he or she may lose confidence in the public system and purchase supplemental retirement products in private markets. Additionally, if private pension systems offer greater incentives for remaining in the workforce (as is true with Social Security in the United States) consumers may choose to purchase such products and not life insurance. While significant pension data for Japan is unavailable currently, this would be an interesting point to study further.

Limitations in Data Collection

As with any research, there are limitations in the data collected. One of the primary limitations was the lack of data. The oldest data collected on the population is from the 1950s. The majority of the Japanese insurance data presented is from 1970 to 2015. The only internationally available data on pension contribution and total assets is after the pension reforms in the 2000s. This data is stagnant and unremarkable, offering no comparative insights. Additionally, much of the insurance data found grouped all insurance payments together, without distinguishing between life and non-life insurance. Even the life-specific insurance data for Japan as presented in the above figures does not indicate if the policies are Whole Life, Universal, or Term. The relationship between the insured and the beneficiary (i.e. spouse vs.

child) and whether or not the insured is male or female would also be remarkable in this research. If males were significantly more likely to hold life insurance policies, the prevalence of traditional gender roles would be demonstrated. Additionally, qualities such as long-term care, disability, or cash-value policy features would also affect consumer behavior. Ideally, this research would include trends with such factors considered. As this data has not been collected it is unable to be included. However, the potential for further research is clear.

Methodology

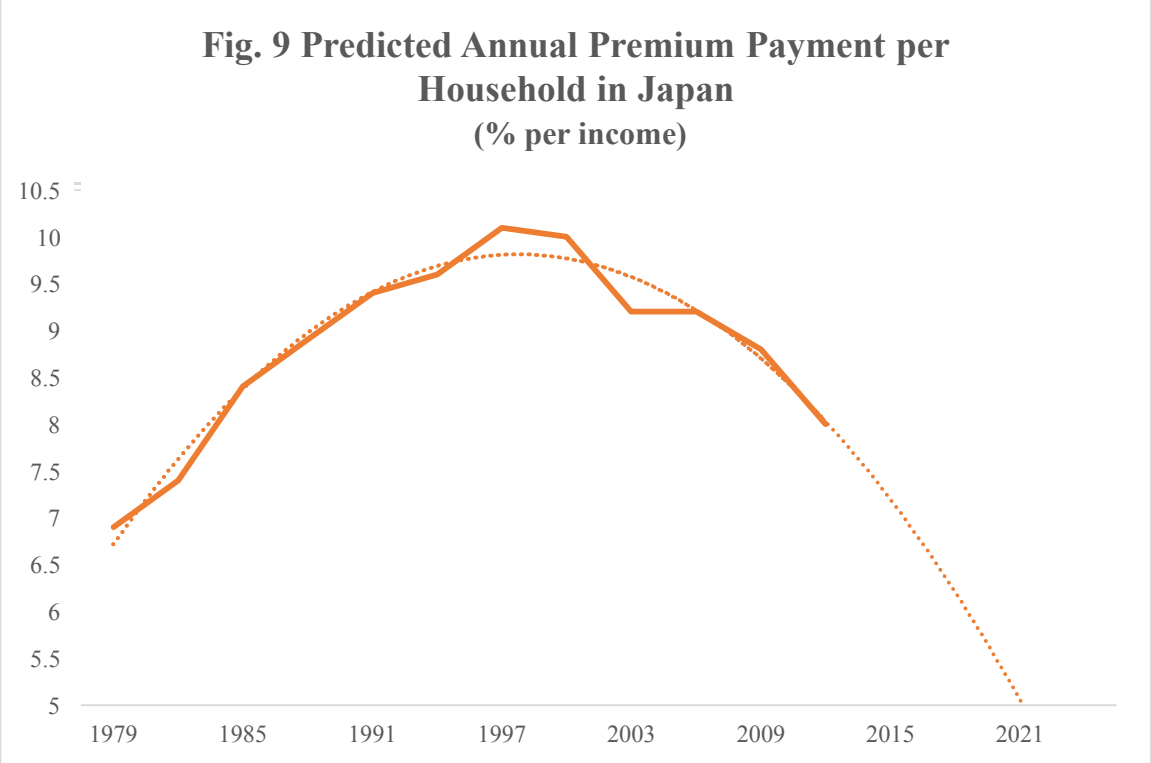
Using the Japanese data from 1970-2015 (shown in the figures above), a polynomial model was created to fit each of the dependent variables, premium payments and coverage amount. This trend line was extended into the future to identify trends and make a prediction, without identifying causation. Trend lines do not indicate why certain conditions exist and must be analyzed further. The prediction from the trend model implicitly indicates that the causative variables will continue.

To gain an understanding of potential causation, the relationships between variables (aging rate, birthrate, marriage rate, premium payments, and coverage amount) were compared using regressions. Regression results were analyzed to show positive and negative relationships. P-values and r-squared indicate the significance and the closeness between the data and the regression model. Notable variables such as premium payment (% per household), average household coverage amount, birthrate, aging rate, GDP growth per capita, and marriage rate were tested. The results of the regression indicate the relationship between variables, for example birthrate and premium payments. Specifically, regressions test whether dependent variables, premium payment and coverages, are affected by the explanatory variables, birthrate, and aging,

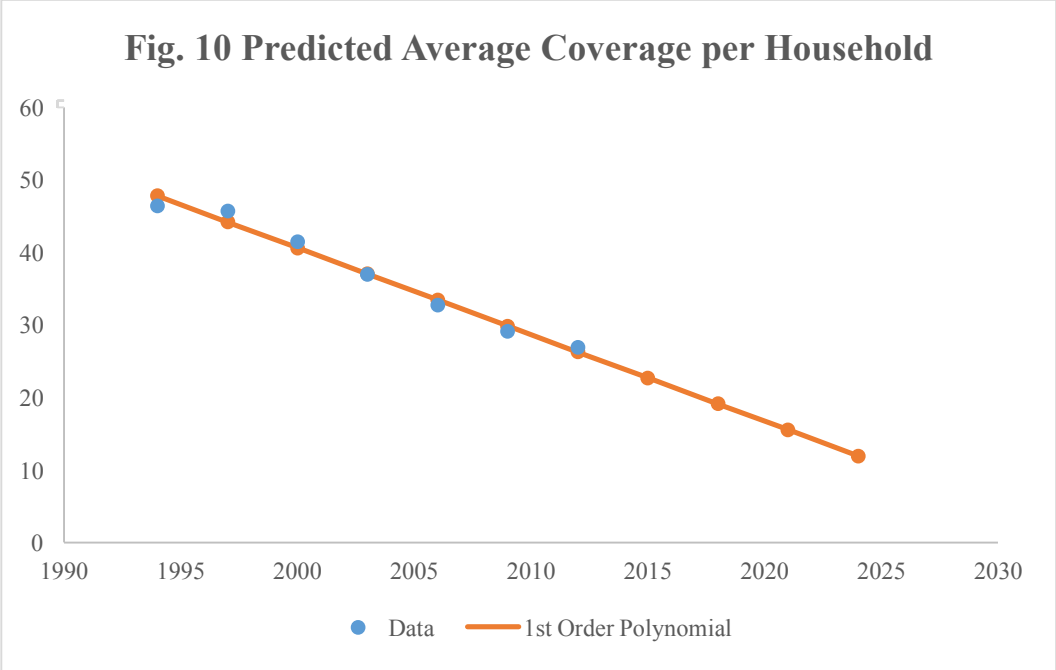
as the theory predicts. The results are interpreted in the context of the overall thesis, and they are used to determine the conclusion of the theory.

Data Results

The Annual Premium Payment per Household (% of income) in Japan data follows a simple polynomial curve. Using a second order polynomial, we can estimate a best line of fit. The equation $y = -0.0793x^2 + 1.1507x + 5.6432$ fits the data fairly well; the R^2 indicates the regression model accounts for 96% of the variation in the premium payment. Using this equation, a prediction can be provided. If annual premium payment per household were to continue on its current trajectory, by 2021, households would only spend 5% of income on life insurance. This trajectory predicts a savings rate of 5%. This prediction is of course affected by a lack of data prior to 1979. Data prior to 1979 may indicate that this bump is part of a larger cycle, which may once again increase.



Regression can also be used to predict average amount of coverage. The data did not follow a simple curve, and one single polynomial did not adequately approximate the data, and resulted in unlikely extreme negatives or positive swings. There seems to be a structural break at the year 1994. The equation y = -3.58x + 47.74 accounts for 98% of the variability from 1994 onwards. Interestingly, this equation continues downward, although the first order polynomial does not account for the curvature of the data. Forecasting with this equation results in and estimated 15 million yen spent on life insurance coverage in 2020.



While many regressions were run with different combinations of variables, the most relevant and moderately successful was the regression of premium payments on aging rate and birthrate and the regression of coverage amount on aging rate and birthrate. Both premium payments and coverage amount are used as measures for the amount of insurance that consumers deem necessary, and the amount of policies in force. Both of these are per household, thus adjusted for population.

The regression of premium payments on aging rate and birthrate resulted in the following equation: [1]

$$Premium\ Payments = \underset{(0.066)^{***}}{-0.255\ Aging\ Rate} - \underset{(0.189)^{***}}{1.005\ Birthrate} + \underset{(2.903)^{***}}{23.085}, \quad R^2 = 0.783$$

This model that includes the aging rate and birthrate accounts for 78% of premium payment variability. The two explanatory variables are statistically significant at 99% confidence. Equation indicates that a 1% increase in the percent of the population over 65 (aging rate) would mean a 0.255% decrease in the percent of household income allocated to premium payments. This suggests that, as the total population ages, there is a less need for life insurance. This supports the original theory. Additionally, a decrease in the birthrate from by one birth per 1,000 people would mean the percentage of income devoted to premium payments would increase by 1.005 percent. Suggests that as there are fewer births, there is more need for life insurance. This contrasts with the original theory. Birthrate has a larger impact on premium payment than aging. In total, the combined effect of birthrate and aging indicates that as birthrate decreases, premium payments increase, contrasting the theory. This could be due to a larger "beneficiary spouse" effect than "beneficiary child" effect.

The regression of coverage amount on aging rate and birthrate resulted in the following equation:

[1] Standard error is reported below each estimate. The number of stars listed indicate the level of confidence that the null hypothesis (that the coefficient = 0) can be rejected.
*** 99%-100% confidence level
** 95%-99% confidence level
* 90%-95% confidence level
- <90% confidence level

$$Coverage\ Amount = \underset{(0.623)^{***}}{-1.183\ Aging\ Rate} \underset{(1.059)^{**}}{-4.992\ Birthrate} + \underset{(20.13)^{***}}{102.45},\ R^2 = 0.757$$

Aging rate and birthrate model accounts for 76% of coverage amount variability. The variables are statistically significant at 95%. This equation indicates that a 1% increase in the percent of the population over 65 (aging rate) would mean a 1.18 million yen (2015) (approx. $9,700 USD) decrease in the average household coverage amount (face value of the policies). This suggests that, as the population ages, there is less need for life insurance. This supports the original theory. Additionally, a decrease of one live birth per 1,000 people would mean a 4.992 million yen (2015) (approx. $41,000 USD) increase in the coverage amount. This suggests that as there are fewer births, there is more need for life insurance coverage. This contrasts with the original theory. Birthrate has a larger impact on coverage. In total, the combined effect of birthrate and aging indicates that as birthrate decreases, coverage amount increases, contrasting the theory. This could again be due to a larger "beneficiary spouse" effect than "beneficiary child" effect, just as the previous regression suggested.

Considering that life insurance is purchased for the protection of one's spouse, the next logical variable to test is marriage rate. The regression of premium payments on aging rate and birthrate resulted in the following equation: [2]

$$Premium\ Payments = \underset{(0.066)^{***}}{-0.255\ Aging\ Rate} \underset{(0.189)^{***}}{-1.005\ Birthrate} + \underset{(2.903)^{***}}{23.085},\ R^2 = 0.783$$

[2] Standard error is reported below each estimate. The number of stars listed indicate the level of confidence that the null hypothesis (that the coefficient = 0) can be rejected.
*** 99%-100% confidence level
** 95%-99% confidence level
* 90%-95% confidence level
- <90% confidence level

Aging rate and birthrate account for 78% of premium payment variability. Equation is statistically significant at 99% confidence. Equation indicates that a 1% increase in the percent of the population over 65 (aging rate) would mean a 0.255% decrease in premium payments (as a percent of household income). Suggests that as the total population ages, there is a less need for life insurance. This supports the original theory. Additionally, a 1% decrease in birthrate (live births per 1,000 people) would mean a 1.005% increase in premium payments. Suggests that as there are fewer births, there is more need for life insurance. This contrasts the original theory. Birthrate has a larger impact on premium payment than aging. In total, the combined effect of birthrate and aging indicates that as birthrate decreases, premium payments increase, contrasting the theory. This could be due to a larger "beneficiary spouse" effect than "beneficiary child" effect.

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$$Coverage\ Amount = -1.183\ Aging\ Rate - 4.992\ Birthrate + 102.45$$
$$R^2 = 0.757 \qquad (0.623)^{***} \qquad (1.059)^{**} \qquad (20{,}13)^{***}$$

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aging indicates that as birthrate decreases, coverage amount increases, contrasting the theory. This could again be due to a larger "beneficiary spouse" effect than "beneficiary child" effect, just as the previous regression suggested.

Considering that life insurance is purchased for the protection of one's spouse, the next logical variable to test is marriage rate. The regression of premium payments on marriage rate, aging rate, and birthrate resulted in the following equation:

$$\begin{array}{cccccc} Premium\ Payments = & 1.4129\ marriage\ rate & - & 0.222\ Aging\ Rate & - & 1.204\ Birthrate + 15.97 \\ R^2 = 0.937 & (0.319)^{***} & & (0.037)^{***} & & (0.117)^{***} \quad (2.307)^{***} \end{array}$$

Marriage rate, aging rate and birthrate account for 94% of premium payment variability. Equation is statistically significant at 99%. Equation indicates that a 1% increase in marriage rates would increase premium payments (as a percent of household income) by 1.41%. Suggests more marriages create a larger need for life insurance, supporting the "spousal" effect theory. Additionally, an increase in the percent of the population over 65 (aging rate) would mean a 0.22% decrease in premium payment. Suggests that as the population ages, there is less need for life insurance. This support the original theory. Additionally, a 1% decrease in birthrate (live births per 1,000 people) would mean a 1.2% increase in the coverage amount. Suggests that as there are fewer births, there is more need for life insurance coverage. Marriage rates have the largest impact on premium payments. In total this suggests that the strongest factor impacting premium payments is marriage, not birthrate. In context of the theory, this means that the "spousal" effect is stronger than the "beneficiary" effect.

The regression of coverage amount on marriage rate, aging rate and birthrate has similar results with the equation:

$$\begin{array}{cccccc} Coverage\ Amount = & 18.74\ marriage\ rate & - & 1.768\ Aging\ Rate & - & 11.367\ Birthrate + 61.924 \\ R^2 = 0.940 & (3.404)^{***} & & (0.342)^{***} & & (1.283)^{***} \quad (12.839)^{***} \end{array}$$

Marriage rate, aging rate and birthrate account for 94% of coverage amount variability. Equation is statistically significant at 99%. Equation indicates that a 1% increase in marriage rates would increase average household coverage amount (face value of policies) by 18.74%. Suggests more marriages creates a larger need for life insurance, supporting the "spousal" effect theory. Equation also indicates that a 1% increase in the percent of the population over 65 (aging rate) would mean a 1.77% decrease in the coverage amount. Suggests that as the population ages, there is less need for life insurance. This support the original theory. Additionally, a 1% decrease in birthrate (live births per 1,000 people) would mean a 11.37% increase in the coverage amount. Suggests that as there are fewer births, there is more need for life insurance coverage. This contrasts the original theory. Marriage rate has the largest impact on coverage amount, not birthrate. In context of the theory, this means that the "spousal" effect is stronger than the "beneficiary" effect, as the previous regression also suggests.

Other variables were also tested, such as GDP growth per capita, and other combinations of aging rate, marriage rate, birthrate, premium payment, and coverage amount were tested. However, these tests were less significant, insignificant or presented the same results.

In total, results indicate that the marriage rate has a greater impact on the purchase of life insurance products, and outweighs the impact of birthrate. Marriage rates (Fig. 11) are also declining for much of the same reasons as birthrate as discussed in the history section of this paper. Similar to the original thesis, since marriage rates are decreasing (and have a large impact on insurance purchases) insurance spending should still decrease as predicted.

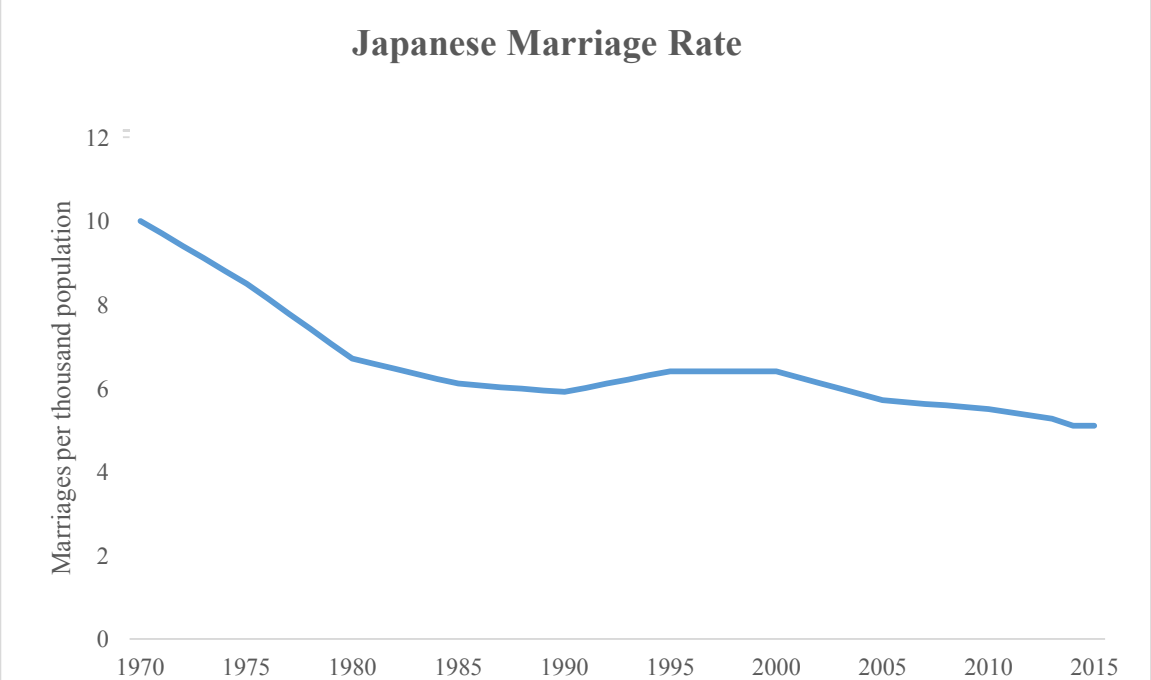

Fig. 11 Marrages in Japan per thousand populaiton from 1970 to 2015. Source: Ministry of Health and Human Services

Comparison to the United States

The United States has many of the same trends as Japan. Life expectancy (Fig. 12) follows the same trend for both the United States and Japan, although life expectancy is higher in Japan. Given that demographic trends in the United States and Japan are similar, life insurance trends are expected to follow similar trends. Comparable data using the same metrics was not able to be found for the United States life insurance market.

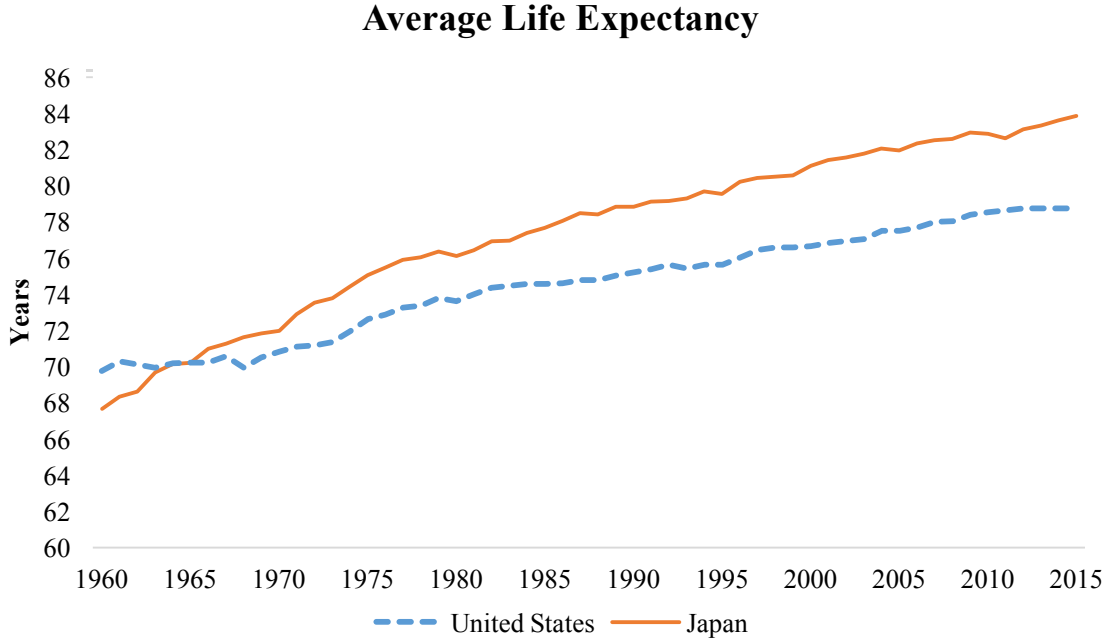

Fig. 12 Average life expenctancy in years from 1960 to 1915 in Japan and the US. Source: Ministry of International Affairs and Communications, Satistics Bureau United Nations Population and Vital Statistics Report

Additionally, birthrate (Fig. 13) is also declining in the United States, although not yet at the level of Japan. There is a clear downward trend that has persisted since the 1970s.

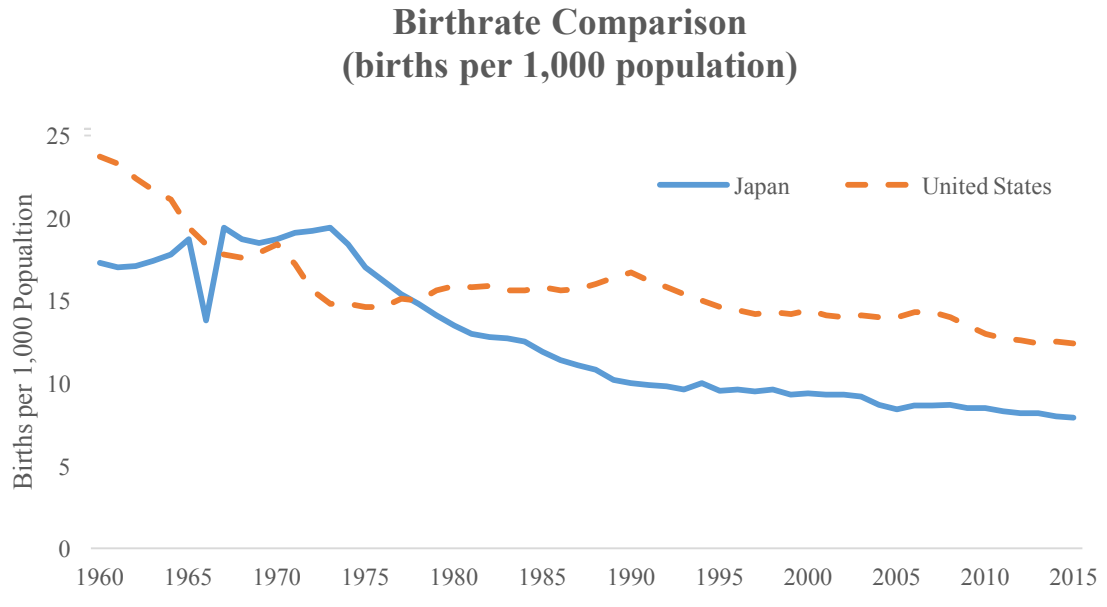

Fig. 13 Births per 1,000 population from 1960 to 2015 in Japan and the US. Source: Ministry of Internal Affairs and Communications, Statistics Bureau; United Nations Population and Vital Statistics Report and U.S. Census Bureau: International Database

Just as in Japan, Marriage rate in the United States is also declining. In 1970, the percent of married people to total population over age 15 dropped from 67% to 54% in 2017. Regardless of whether the "beneficiary spouse" or "beneficiary child" effect is stronger, both marriage rate and birthrate are decreasing. This study of Japanese life insurance relationships implies that the same industry conditions are happening in the United States. While the level of impact marriage rates and birth rates have on U.S. life insurance markets requires further research, a similar trend can be inferred because of similar industry conditions.

Conclusion

In conclusion, there is a relationship between demographic changes and life insurance trends. Contrary to the original theory, marriage rates have a larger impact on life insurance sales than birthrate. The original theory postulated that as birthrate decreases, the number of children who take care of the elderly is less, thus the elderly are more reliant on their spouses, and life insurance is purchased as a protection for spouses more than for children. It was found that Marriage rate has a greater impact on life insurance purchase than birthrate. As marriage rate decreases, premium payments and coverage amount decrease. This suggests that life insurance is purchased as protection for spouses more than for children, thus the "spousal beneficiary effect" is stronger than the "beneficiary child effect". Still, Marriage rates are decreasing, and the purchase of life insurance products is also expected to decrease. The United States is on a similar trend, although not yet to the same extreme degree as Japan. This seems to be a worldwide trend in developed countries. Additional research is needed to analyze these trends in other countries such as the United States. Specific products, such as Whole, Universal, or Term policies should also be analyzed. Life insurers should consider such changing consumer needs, in the development of new products that focus on benefits before death, such as cash-value, disability

coverage, long-term care coverage, or even retirement coverage. In addition, this theory suggests that marketing efforts targeting married couples instead of parents would be more successful in the future.

References

Date, Y., & Shimizutani, S. (2007). Why has Japan's fertility rate declined? An empirical literature survey with an emphasis on policy implications. *Japanese Economy, 34*(1), pp. 4-45.

Davies, Roger, J., and Ikeno, Osamu. (2002). *The Japanese mind: understanding contemporary Japanese culture*. Location: Tuttle Publishing.

Francis L. K, H. S. U. (1971). Filial Piety in Japan and China: borrowing, variation and significance. *Journal of Comparative Family Studies*, 2(1), pp. 67-74.

Higo, M. (2010). *Social construction of older workers: The experiences of aging under the institution of lifetime employment in Japan.* Doctoral dissertation retrieved from Econlit

Horiai, M. B. (2011). *Beyond the demographic transition: The case of Japan.* Doctoral dissertation retrieved from Econlit

Horioka, C. Y., Suzuki, I, W., & Hatta, T. (2007). Aging, savings, and public pensions in Japan. *Asian Economic Policy Review, 2*(2), pp. 303-319. doi:10.1111/j.1748-3131.2007.00080.x

Kawagoe, M. (2009). What is the economic value of Japanese longevity? Estimating the outcome of economic growth. *Japanese Economy, 36*(3), pp. 28-60.

Komine, T., & Kabe, S. (2009). Long-term forecast of the demographic transition in Japan and Asia. *Asian Economic Policy Review, 4*(1), pp. 19-38.

Matsumoto, T. (2015). Lecture presented at the foundation for the advancement of

life & insurance around the world (FALIA) seminar in Dai-ichi Life Higashi-Totsuka Training Center, Yokama. Retrieved from FALIA records

Ministry of Health and Human Services

Ministry of Internal Affairs and Communications, Statistics Bureau; United Nations Population and Vital Statistics Report and U.S. Census Bureau: International Database

Mizukoshi, K., Kohlbacher, F., & Schimkowsky, C. (2016). Japan's ikumen discourse: macro and micro perspectives on modern fatherhood. *Japan Forum, 28*(2), pp. 212-232.

Schaede, U., & Nemoto, K. (2006). Poverty and politics: evaluating public assistance in Japan. In. university of California, San Diego: graduate School of international relations and pacific Studies.

Shionoya, Y. (2000). Social security in Japan. In. Chiyoda-ku, Tokyo, Japan: national institute of population and social security research.

Takada, Masahiro (1999). *Japan's economic miracle: underlying factors and strategies for the growth*. Lehigh University

The Foundation for the Advancement of Life & Insurance Around the World (FALIA)

Wakabayashi, M. (2001). Retirement saving in Japan: with emphasis on the impact of social security and retirement payments. *Journal of the Japanese and International Economies, 15*(2), pp. 131-159. doi:https://doi.org/10.1006/jjie.2001.0468

Warley, Paul. *Japanese Culture*. 4th ed., University of Hawai'i Press, 2000.

World Bank. 2017. World Development Indicators 2017

"World War II in the Pacific." (2016). Holocaust Encyclopedia. United States Holocaust

Memorial Council, n.d. Web. Retrieved from www.ushmm.org

Yamada, T. (1987). *Social security, savings, and labor supply of the elderly in Japan*, City University of New York, Ann Arbor.

Zielenziger, M. (2007). *Shutting out the Sun: How Japan Created Its Own Lost Generation*. New York: Vintage.

Year	Birthrate (Japan)	Birthrate U.S.	Japan Population Aging Rate	GDP Per Capita (Japan) Current USD	GDP per Capita (U.S.) Current USD	Japan Marriages per thousand pop.	US Marriage rate	Japan Savings Ratio
1960	17.30	23.7		479.00	3007.12			
1961	17.00	23.3		563.59	3066.56			
1962	17.10	22.4		633.64	3243.84			
1963	17.40	21.7		717.87	3374.52			
1964	17.80	21.1		835.66	3573.94			
1965	18.70	19.4		919.78	3827.53			
1966	13.80	18.4		1058.50	4146.32			
1967	19.40	17.8		1228.91	4336.43			
1968	18.70	17.6		1450.62	4695.92			
1969	18.50	17.9		1669.10	5032.14			
1970	18.70	18.4	7.1	2027.07	5246.88	10.00	0.67	
1971	19.10	17.2	7.38	2260.38	5623.44	9.70		
1972	19.20	15.6	7.66	2951.76	6109.93	9.40		
1973	19.40	14.8	7.94	3977.25	6741.33	9.10		
1974	18.40	14.8	8.22	4331.40	7242.44	8.80		
1975	17.00	14.6	7.9	4635.12	7820.07	8.50	0.65	
1976	16.20	14.6	9.32	5171.04	8611.40	8.14		
1977	15.40	15.1	10.74	6303.16	9471.31	7.78		
1978	14.80	15	12.16	8776.41	10587.29	7.42		
1979	14.10	15.6	13.58	9058.24	11695.55	7.06		
1980	13.50	15.9	9.1	9416.63	12597.67	6.70	0.63	
1981	13.00	15.8	9.26	10331.74	13993.17	6.58		
1982	12.80	15.9	9.42	9539.08	14438.98	6.46		
1983	12.70	15.6	9.58	10333.34	15561.43	6.34		
1984	12.50	15.6	9.74	10912.86	17134.29	6.22		
1985	11.90	15.8	10.3	11599.74	18269.42	6.10	0.62	
1986	11.40	15.6	10.54	17079.60	19115.05	6.06		
1987	11.10	15.7	10.78	20593.52	20100.86	6.02		
1988	10.80	16	11.02	24880.21	21483.23	5.98		
1989	10.20	16.4	11.26	24792.19	22922.44	5.94		
1990	10.00	16.7	12.1	25417.28	23954.48	5.90	0.61	18.1
1991	9.90	16.2	12.34	28874.36	24405.16	6.00		19.7
1992	9.80	15.8	12.58	31376.14	25492.95	6.10		19.5
1993	9.60	15.4	12.82	35865.66	26464.85	6.20		19.2
1994	10.00	15	13.06	39268.57	27776.64	6.30		16.9
1995	9.54	14.6	14.6	43440.37	28782.18	6.40	0.59	17.0
1996	9.60	14.4	14.96	38436.93	30068.23	6.40		15.3
1997	9.50	14.2	15.32	35021.72	31572.69	6.40		15.7
1998	9.60	14.3	15.68	31902.77	32949.20	6.40		17.1
1999	9.30	14.2	16.04	36026.56	34620.93	6.40		15.9
2000	9.40	14.4	17.4	38532.04	36449.86	6.40	0.58	15.1
2001	9.30	14.1	17.9	33846.47	37273.62	6.26		12.0
2002	9.30	14	18.4	32289.35	38166.04	6.12		11.7
2003	9.20	14.1	18.9	34808.39	39677.20	5.98		10.8
2004	8.69	14	19.4	37688.72	41921.81	5.84		10.5
2005	8.41	14	20.2	37217.65	44307.92	5.70	0.57	10.0
2006	8.65	14.3	20.76	35433.99	46437.07	5.66		9.1
2007	8.63	14.3	21.32	35275.23	48061.54	5.62		9.2
2008	8.70	14	21.88	39339.30	48401.43	5.58		9.2
2009	8.50	13.5	22.44	40855.18	47001.56	5.54		10.9
2010	8.50	13	23	44507.68	48373.88	5.50	0.55	10.2
2011	8.30	12.7	23.56	48168.00	49790.67	5.42		10.4
2012	8.20	12.6	24.12	48603.48	51450.12	5.34		9.1
2013	8.20	12.4	24.68	40454.45	52787.03	5.26		6.8
2014	8.00	12.5	25.24	38096.21	54598.55	5.10		5.9
2015	7.90	12.4	26.8	34474.14	56469.01	5.10	0.54	6.6