Japanese Financial Market Size Projections based on the Demographic Segmentation.

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1. Introduction: market segmentation by age

The current low fertility rate in Japan, below the replacement level, simultaneously accelerates the ageing profile of Japan while also contributing to population decline, and therefore it is inevitable that the consumption market in Japan is prone to shrink over the coming decades. In particular the change of age structure should be noted, because consumption behavior is highly dependent on age as well as the generation or cohort and the time point or period. There are very few goods or services independent of age, more precisely, most goods or services are created and produced with particular reference to the tastes, mentality and life-stage of each age group.

The market segmentation on the perspective of demographics is a method of the marketing analysis which focuses on this factor, and the essential method in business demography. There would be various kinds of market segments and major categories should include (1) demographic characteristics such as age, sex, ethnicity and generational factors, (2) social and economic characteristics such as income, assets, occupation and education level, (3) geographic characteristics such as residential area, urban-rural difference and climate, (4) psychological characteristics such as lifestyle, and personality (5) other characteristics such as usage frequency and quality of goods or services. In this paper, I would like to focus on the demographic characteristics, especially age, to provide an analysis of the influence of low fertility and the highest life expectancy on the financial markets in Japan. Therefore what financial instruments are demanded depending on age or family composition is presented here.

Additionally since the very low fertility causes a decline in the total population and household numbers in the long run, it is inevitable that the consumption market size will shrink. In most industrialized countries, including Japan, population is no longer expected to serve as the driving force of economic growth. These countries need to

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carefully consider the current structure of their economy in order to deal with the population decline. It should be underscored that this is one of the urgent priorities to address.

The main purpose of this paper is to realise the future trend of financial market size in the light of demographic changes, especially very low fertility and the highest life expectancy in Japan. Firstly we would like to examine the statistical problems of the household, and review the structural changes of household type and the age profile of households in the near future. Next, the method for age-based projection of household numbers should be briefly explained. Finally several market sizes will be projected as case studies. Among them is the financial market**,** which will be given the particulars. It is significant that every result clarifies in quantitative terms how the structural changes of age caused by low fertility can impact the consumption market.

Over the past few decades, some comprehensive works not only covering the influence of demographic changes on consumption, but also on the marketing research method in terms of the demography have been published around the world, particularly in U.S., Australia and France (De Bartolo et al 2003; Kintner et al. 1994; Lazer 1994; Murdock and Swanson 2008; Pol 1987; Pol and Thomas 1997; Rao and Wicks 1994; Siegel 2001). By contrast, there are actually very few academic articles in Japan (Adachi 2004; Konishi 2001; Shindo 1998; Muto and Harada 2002; Wada 2005, 2006, 2010), although the importance of applying demography to market analysis is recognized.

2. The definition and trend of the household in Japan

2-1 The method of household projection

At the beginning, the future situation of households in Japan should be indicated. This number is officially projected by the National Institute of Population and Social Security Research (IPSS) under the Ministry of Health, Labor and Welfare in Japan. More specifically, the numbers of households by various specific characteristics as at October 1st each year for 25 years between 2010 and 2035 were projected. In this case, the household transition method was used, an explanation of which follows. Firstly, the future distributions combined with the marital status and the household position are estimated through the transition probability regarding the member of private households. Then the annual number of households categorized by sex, age (every five-year) group, marital status, household position and family type is calculated in relation to the population[3] with each corresponding category. Using this data, the number of private

[3] IPSS has projected them separately. The National Institute of Population and Social Security Research (2006).

households is also projected by family type. Family types in this projection consist of "one-person", "a married couple-only", "a married couple with their child/children", "parent with his/her child/children" and "others" of each household.

2-2 The future trend of household by family type

The actual and future numbers of private households are demonstrated in terms of the family types in Figure 1 and the age of the household head in Figure 2 and 3. Respectively from Figure 1, 2 and 3, we can find the trend toward nuclear or single family and the ageing in Japan.

Figure 1 indicates that both of the percentage and the number of single households have risen and will continue to rise in the future due to the tendency to marry later and the very low marriage rate. This has led to the number of single households containing elderly persons gradually increasing along with the rapid ageing trends. The nuclear family whose types consist of "A married couple-only", "A married couple with their child/children" and "Parent with his/her child/children" have declined and will clearly shrink in the future in both of the ratio and the number. Examining the breakdown, both the percentage and the number of a married couple-only household have risen and continue to rise rapidly, whereas the same indicators of a married couple with their child/children continue to diminish. Actually households of a married couple-only and married couple with their child/children are supposed to cancel out each other in the whole movement of the nuclear family.

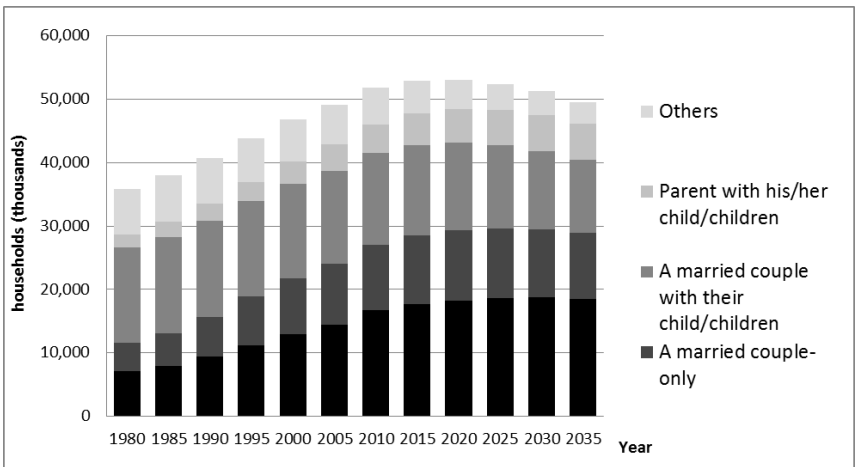

Figure 1. Private households by family type: Japan 1980-2035

Source: The National Institute of Population and Social Security Research (2010)

Next, consider private households by the age of the household head illustrated in Figure 2 and 3. It is important to determine household ageing rather than simply general ageing to achieve useful analysis regarding the influence on the macroeconomic consumption patterns. It should be noted that the number of household head within private households is identically equal to the number of private household by definition. Figure 2 which demonstrates the number of male householders by age groups indicates that the proportion is not varying greatly, whereas the number in total is declining slightly and the number of households with a young household head is shrinking. By contrast, when considering female householders by age, we can see more dramatic changes as evidenced in Figure 3. These households are growing steadily, even though the total size is actually less than half that of male householders. The size and the percentage of elderly householders, in particular those aged 80 years and older, are projected to rise rapidly.

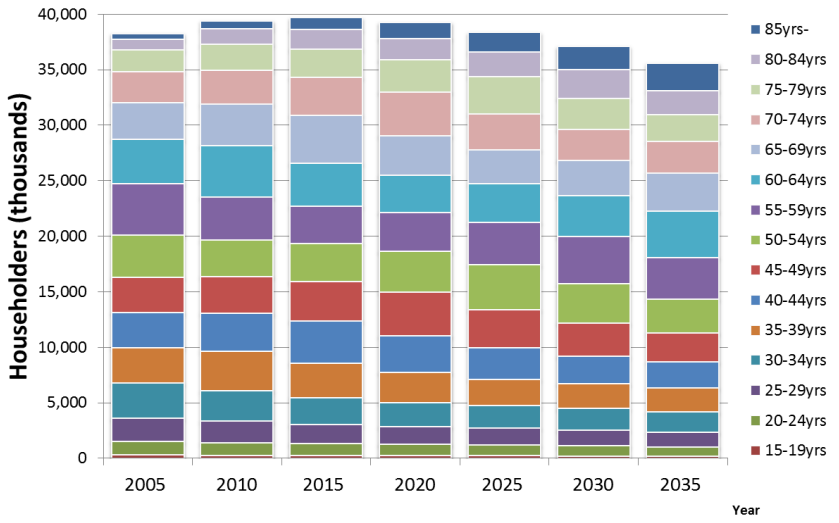

Figure 2. Male private householders by age: Japan 2005-2035

Source: The National Institute of Population and Social Security Research (2013) Household Projections for Japan by Prefectures : 2010-2035.

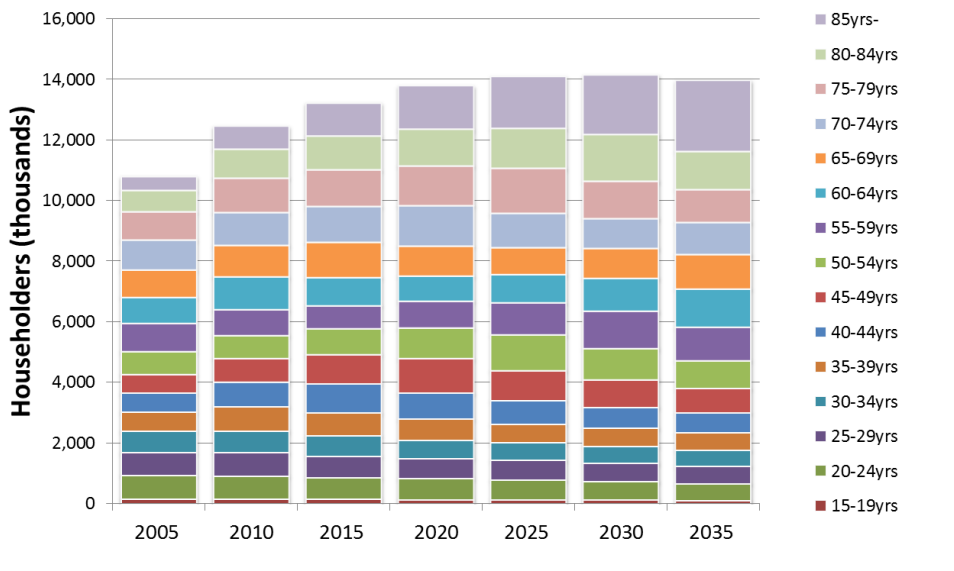

Figure 3. Female private householders by age: Japan 2005-2035

Source: The National Institute of Population and Social Security Research (2013) Household Projections for Japan by Prefectures : 2010-2035.

3. The projection of the market size

3-1 Statistical problem of consumption unit and the definition of market size

It is clear that the demographic structural changes are likely to influence the Japanese economy. Nonetheless, the quantity of consumption actually can only be measured by household units due to the limitations of consumption statistics. Therefore the amount of individual consumption remains difficult to access and analyse. There are several methods to convert the consumption of the household into the consumption of individual members within the household for analyzing strictly the influence of demographic changes (Suzuki 1999). However I am not concerned here with these methods. The future level of consumption should be simply projected with linking the number of households and the age of the householder with regards to demographic analysis.

The market size is generally defined as the total domestic sales of a product or a service for one year. It depends on the utilization purpose, and various results of value are available, as the case may be. The market size is classified to three broad categories, which are the production stage, the distribution stage and the consumption stage. Since

the values of producer and/or distributor are finally added to the products or the services by the consumption stage, the market size at the consumption stage is supposed to be generally larger than one at the production or distribution stage. In this paper, I would like to focus on the market size at the consumption stage and the future sizes of several markets in Japan should be projected through Annual Reports on the Family Income and Expenditure Survey provided by the Statistics Bureau under the Ministry of Internal Affairs and Communications of Japan. This survey covers the all types of household except one-person households containing students within Japan. Approximately 9,000 sample households are selected with the three-stage stratified sampling method.

3-2 Consumption patterns by age

It is natural that consumption levels depend on the age, in addition it is more likely that the consumption pattern by age is quite stable through time periods. For example, the annual consumptions of alcoholic beverages per household by the age of household head are examined in Figure 4. All results are transformed from the nominal values to the real values by annual Consumer Price Index (CPI) on the basis of 2005 in order to remove the possible distortion caused by inflation rates in each year. Therefore, these annual differences are contributed only by the change of consumption level. Thin gray lines shows each age patterns between 2002 and 2008 and they seem to display similar characteristics. The average is presented as the solid black line. Assuming that other goods or services are also age-dependent and that consumption remains sufficiently stable in the future, the patterns should be available to project each market size.

The method of projection in this paper has following procedures. First, the average annual household consumption of a good or service by age of household head is multiplied by the number of households by the age of the household head in 2005. For example, the sum of these products represents the market size of this good or service in 2005. Under the assumption that the consumptions patterns by age are constant, the future number of households should

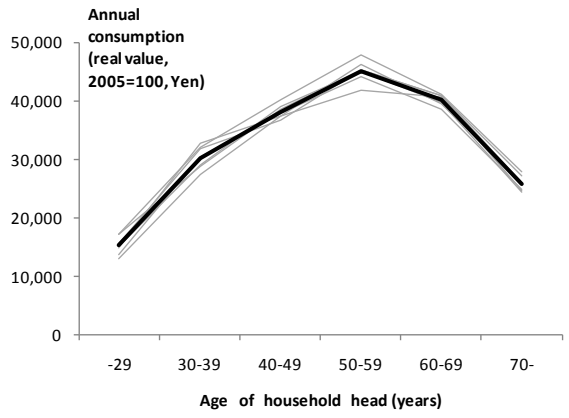

Figure 4. Annual consumption of alcoholic beverages per household by age groups of household head

Source: Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau (2002a-2008a; 2002b-2008b)

be multiplied for projecting market size in future years. That is

$$M^t = \sum_a C_a \cdot H_a^t \ .$$

In this case,

M^t : Market size at the time of t

C_a : Average annual consumption per household by household head age group a

H^t_a : Number of household by household head age group a at the time of t

$t \in T, \quad T = \{2005, 2010, 2015, 2020, 2025, 2030\}$

$a \in A, \quad A = \{-29, 30-39, 40-49, 50-59, 60-69, 70-\}$

For exemple, in the case of alcoholic beverages, the result is presented in Figure 5. As it shows, this market is projected to ensure a stable size around 1.7 trillion Yen (approximately USD 19 billion) annually in the near future with a large component of consumption carried out by households where the household head is in an older age group.

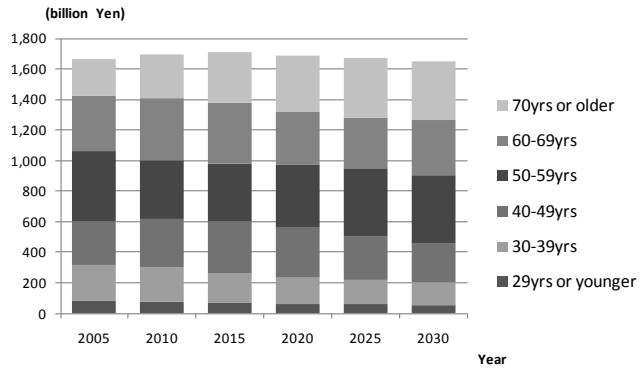

Figure 5. The market size of alcoholic beverages

Source:National Institute of Population and Social Security Research (2008), Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau (2002a-2008a, 2002b-2008b)

4. Savings and financial markets

4-1 Statistical problem for projection of savings

In the most developed countries, the baby boomers born just after the World War II are reaching retirement age. This issue in relation to how they manage their assets, in particular their retirement benefit for using the life after retirement is attracting considerable attention in the financial industry. As the final case study, I would like to deal with the financial market.

In Annual Reports on the Family Income and Expenditure Surveys which have been utilized in this paper, the survey covers only two-or-more-person households in relation savings or debts, whereas the single households are not surveyed in order to alleviate the burden of responses. Admittedly the perspective of savings by age groups would be generally obvious, however, it is inadequate in order to determine the whole financial market with the exception of single households, the proportion of which is surging as described above.

Hence the size of financial market in total or in each age group is projected here on ground of the savings pattern by age groups in the National Survey of Family Income and Expenditure provided by the Statistics Bureau within Ministry of Internal Affairs and Communications of Japan. This survey covers all type of households including single households, and has samples of approximately 54 thousand two-or-more-person households and five thousand single households. It is conducted once every 5 years. The survey in 2009 was used here with a possibility that the data was potentially obsolete. The results of the most recent survey, conducted in 2014, are yet to be released.

4-2 Savings age pattern

Figure 6 shows the balance of savings and liabilities[4] per household by age groups of household head in 2004 along the left axis, and rate of owned houses in the same year along the right axis. The savings are composed of demand deposits[5], time deposits[6], life insurance etc.[7], securities and others. As the age of the household head gets higher, the balance of whole savings increases through to the age of 60. When the breakdown of the savings is examined, in particular, the proportion of time deposits is particularly large due to the small risk and secure benefit in terms of hedging. The ownership rate of homes as assets continues to grow rapidly as people approach their 40s, and then weakens after that age. Meanwhile the balance of liabilities such as liabilities for purchase of houses and/or land is at its peak when people are in their 40s, and then gradually diminishes as people pay back their loans.

[4] Liabilities for purchase, build or extension and rebuild of houses, and purchase of land as well as outstanding balance of purchase of houses and land by installment payment. Loans for daily life, individual proprietors' funds for opening or operating their business, etc. Outstanding balance of monthly and/or yearly installment.

[5] Fluid-typed deposits. Savings to be deposited or drawn easily in the post offices or the banks etc. Ordinary deposits, current deposits, deposits at notice, deposits for tax payments, etc. are included.

[6] Fixed-typed deposits. Savings to be deposited for a period of six months or more in the post offices or the banks etc. Fixed period deposits, installment and fixed period deposits, etc. are included.

[7] Life insurance: Endowment insurance, child insurance, annuity insurance, etc. managed by life insurance companies, Child mutual aid, endowment mutual aid, etc. managed by agricultural cooperatives. Damage insurance: Long term and comprehensive insurances including fire insurance, accident insurance, etc. with maturity repayment. Life insurance or damage insurance without maturity payment is excluded. Postal insurance: endowment insurance, whole life insurance, education endowment insurance which are handled by post offices.

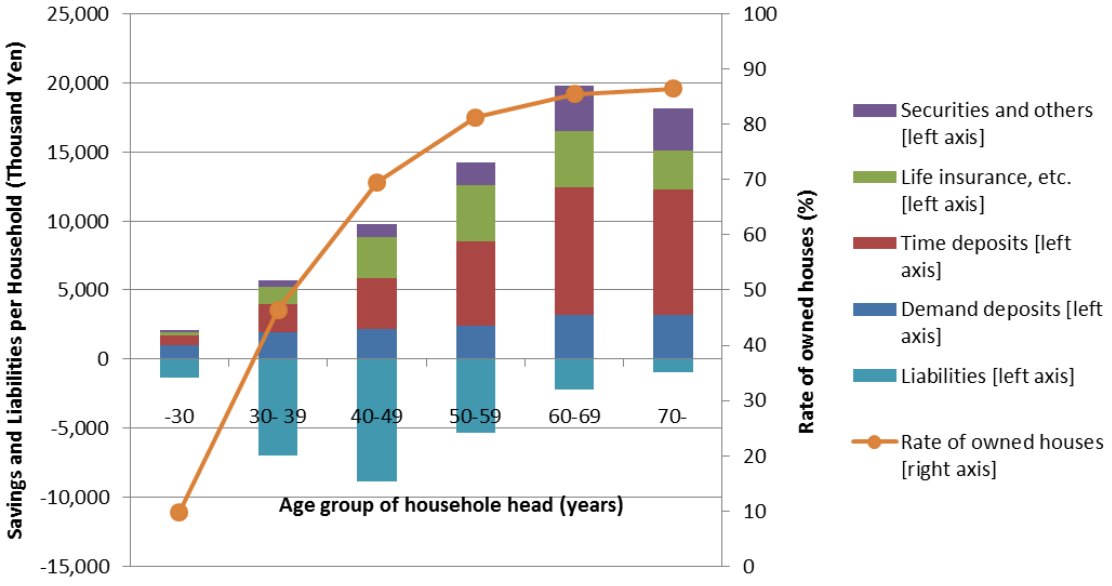

Figure 6 Balance of Savings and Liabilities per Household by Age Group of Household Head

Source: Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau (2004)

Life insurance and other insurance products are popular with persons in their 50s and 60s. It is natural that the balance of life insurance is low when people are in their 70s as they have already considered life insurance earlier in their life. In addition, elderly people, especially persons in their 60s and 70s intensify the proportion of the securities such as stocks or shares. These results indicate that the elderly try to manage the multiple portfolio investment in order to achieve comfortable retirement.

4-3 Securities age pattern

Although this survey was conducted in 2009 when the baby boomers were in their late 50s, I would like to focus on the situation of these securities including the various financial instruments or investment products in order to take a more detailed look at funds management around the age of retirement. Figure 14 demonstrates the breakdown of the securities and the specific savings regrouped in accordance with the purpose of savings. The securities are made up of three parts, which are (1) stocks and shares, unit and open-end trust[8], (2) public and corporate bonds, open-end bond trust[9] and (3)

[8] Stocks and investment trust at market prices as of the end of November 2009.

loan trust, money in trust[10]. At the same time, the specific savings for purposes, the savings for annuity[11] and the foreign currency deposits and foreign bonds[12] along with the right axis are indicated in the Figure 7.

In reference to the results, elderly households are flexibly and efficiently turning over their sufficient funds to stocks, shares and foreign-currency financial products, even though they involve a high degree of risk. Besides, the market of savings for annuity is active once people enter their 50s; this is utilized as one of the higher-yield investments for their post-retirement life.

Figure 8 highlights the percentages of age groups in the specific savings such as securities or foreign currency deposits in order to examine the age targeting of each financial product. It reveals that as to every financial instrument covered in this Figure nearly 40% is accounted for once people enter their 70s and older. Nearly 70% is also accounted for by households aged in their 60s and older. These results show that the elderly people are clearly specified as the dominant targeting population.

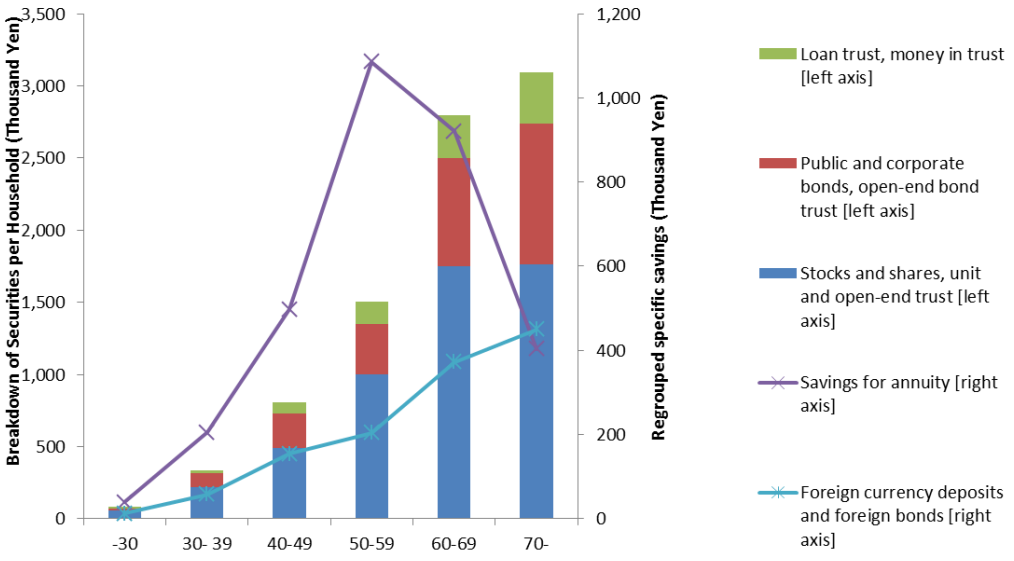

Figure 7 Securities and specific savings per Household by age groups of household head

Source: Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau (2004)

[9] Government bonds, local government bonds, public corporation bonds, financial bonds, industrial bonds, etc.
[10] Loan trust and money trust which are trusted to trust banks.
[11] Annuity products of postal life insurance, individual pension trust, personal pension of life insurance company, asset-building pension etc. Public pension and corporate pension are excluded.
[12] Deposits and bonds in foreign currencies, foreign stocks, investment trust and life insurance in foreign currencies.

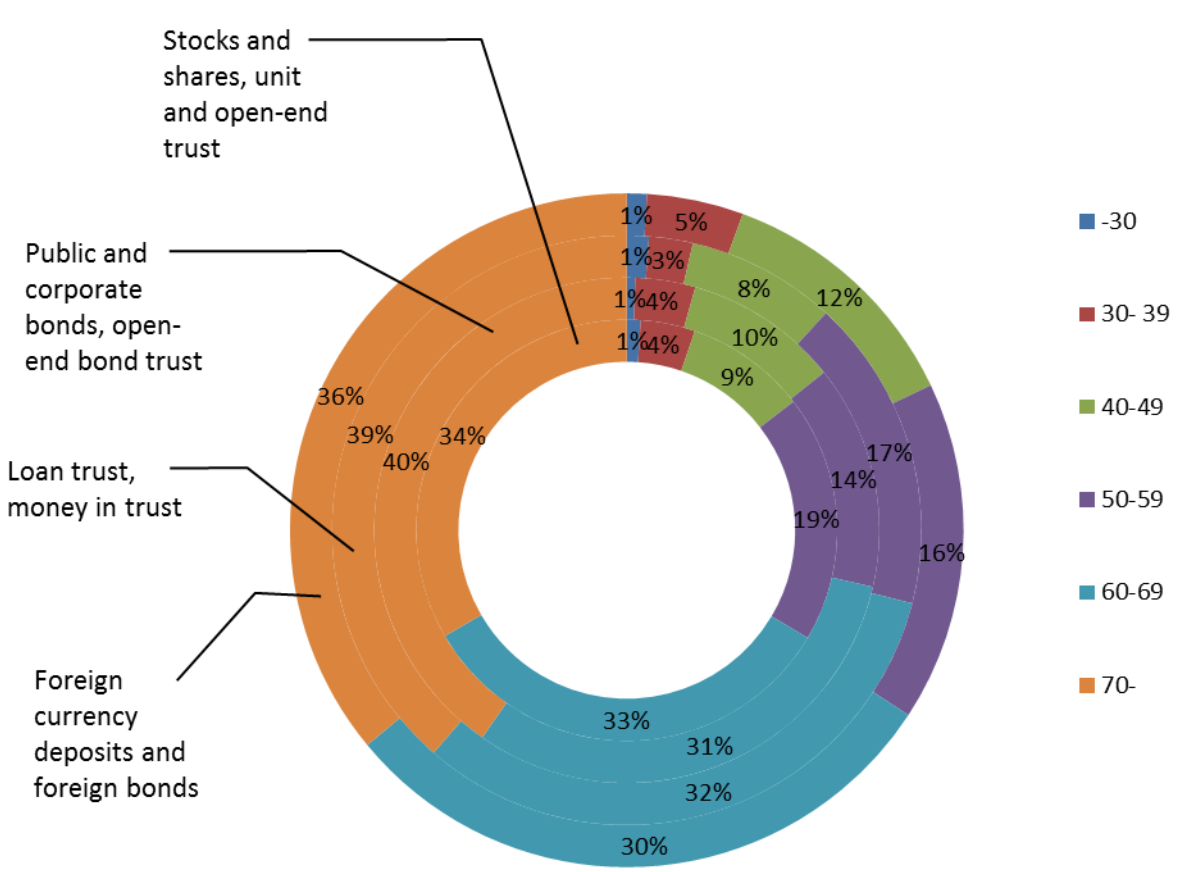

Figure 8 Percentages of age groups in the specific savings

Source: Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau (2004)

4-4 Projection of financial markets

Finally I will project the future sizes of these financial markets on grounds of these savings patterns by age groups of household head in the same way basically. The market size is projected by multiplying the savings or investment of each age group of household head, by future numbers of households of each age group under the assumption that the age structure of savings or investment in the survey year 2004 should be constant.

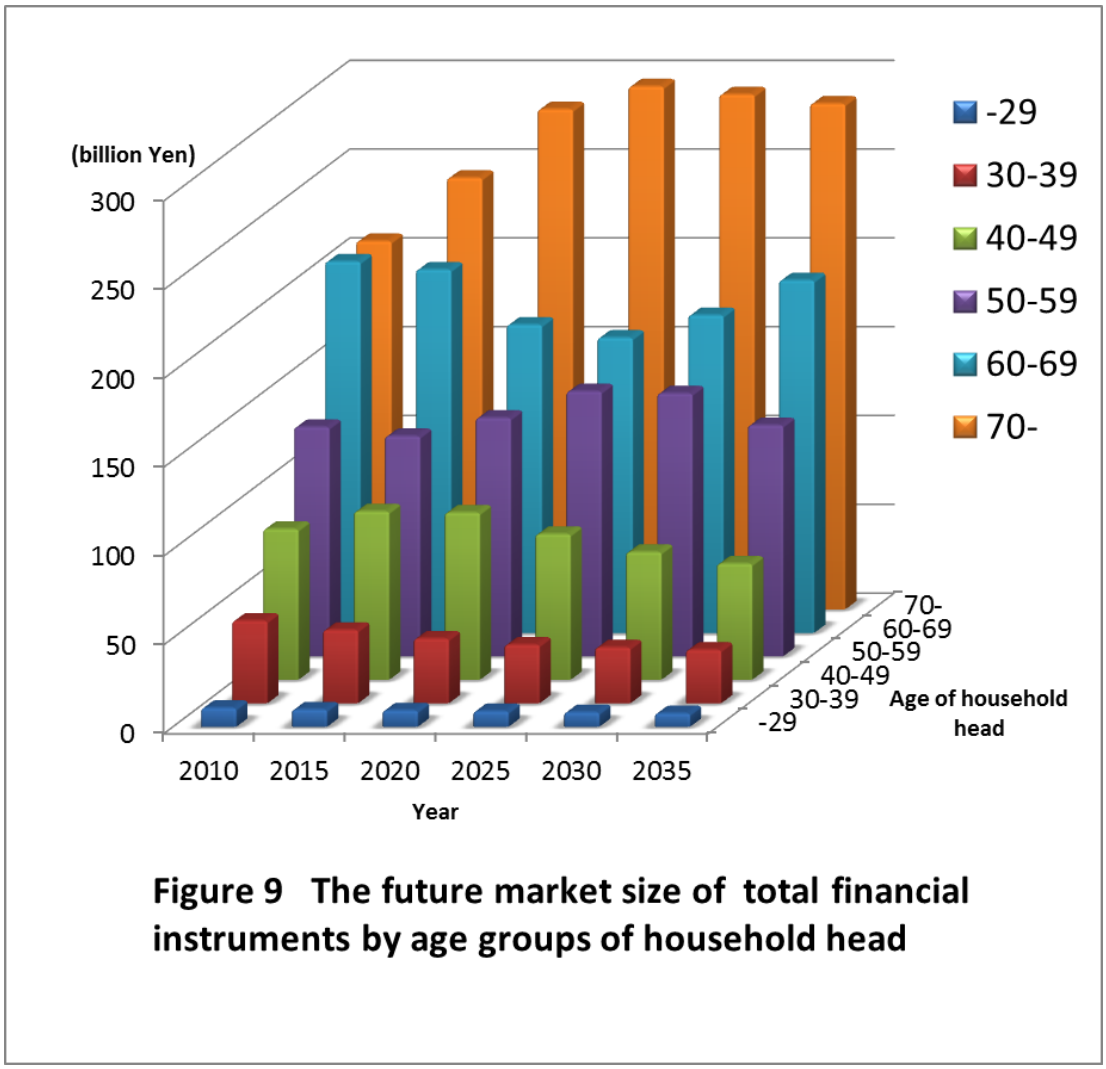

Figure 9 The future market size of total financial instruments by age groups of household head

Table 1 The future market size of total financial instruments by age groups of household head

(billion Yen, 100Yen ≒ 0.91USD in Sept. 2014)

	-29	30-39	40-49	50-59	60-69	70-	Total
2010	10.7	46.6	85.0	129.2	209.2	207.5	688.1
2015	9.8	41.4	94.9	124.1	204.6	243.1	717.9
2020	9.3	36.5	94.3	134.4	173.6	281.7	729.8
2025	8.9	33.1	82.2	149.3	166.3	294.6	734.3
2030	8.3	31.6	72.1	148.1	179.0	290.0	729.1
2035	7.7	30.2	65.5	130.3	198.6	284.8	717.1

Currently the balances of savings by households where the household head is 29 years or under and households where the household head is in their 30s is approximately 11 billion Yen and 47 billion Yen respectively. These numbers are expected to drop to 8 billion Yen and 30 billion Yen respectively by 2035. Each

household where the household head is in their 40s has savings of around 95 billion Yen in 2015 and households where the household head is aged in their 50s has saving of approximately 150 billion Yen in 2025. Moreover the balance of savings by households where the household head is aged 60 years and over, in particular those aged closer to 70 and older experiences rapidly expanding savings in the future. It should be emphasized that the proportion of households where the household head is aged 70 years and over should attain 30%, while the proportion of households where the household head is aged 60 and over should jump to represent more than half of the securities market in total. Observing the movement of each age group over time, the savings of 30s households (where the household head is in their 30s) continue to decrease gradually, and 50's households shape a convex curve at the top in 2025. In contrast 60's households have a concave at the bottom in the same 2025, and 70's households maintain the high level. These cyclical movements from the viewpoint of each age arise from the difference of age, cohort (namely generation) and period. For analyzing strictly, it is necessary to decompose the difference into three effects that are cohort effect, age effect, period effect (Wada 2007). These considerations invite further theoretical and empirical investigation.

5 Conclusion

Finally I would like to describe the conclusion and point out some future issues to be solved. In Japan, the number and proportion of single households and female elderly households are growing remarkably. Besides, with a background like aging of households, any goods or services are classified into a few main types by the age pattern of consumption behaviors. In this paper, the sizes of typical markets are quantitatively projected by 2035. As the results, any market tends to shrink in long term. Among them, older-oriented typed markets are expected to maintain the status quo or to expand their sizes slightly, whereas the sizes are anticipated to contract in the younger-oriented typed markets. It was found that households where the head was aged 60 years and over remarkably divert their funds into the financial products such as securities, life insurance and time deposits. This paper projected the situations by 2035 due to the limitation of household projection, while it is anticipated that most markets in Japan will not be able to avoid shrinking and will negatively affect the whole economy in the future. From that aspect, it is a significant issue to find out what behavior the following generations are likely to have in consumption or savings on the perspective of demography.

In the financial market, elderly people have a profound influence particularly on the securities markets or foreign-currency-denominated products markets. The key issues are how much elderly people will divert their financial funds to consumption of goods or services, and what kind of goods or services they will consume. It would not be an exaggeration to say that economies not only in most industrialized countries including Japan but also in the newly developing countries such as China or India are dependent on the consumption and savings behavior of the elderly people. Even under conditions where interest rates are extremely low in Japan, the funds will not turn to consumption, but pile up in financial assets. If this goes on, it is not likely that the elderly spur more demand. It should be more important to find out the proper balance between consumption and savings of older persons.

Reference

Adachi, Makiko (2004) "The Economic Consequences of Japan's Dwindling Birthrate and Aging Population" *Mizuho Research Paper* [1] June, Mizuho Research Institute.

De Bartolo, Giuseppe et Michel Poulain (éds.) (2003) *La démographie appliquée à la gestion publique et des enterprises*, L'Association Internationale des Démographes de Langue Française.

Jindo, Hiroaki （1998）"The impact of population and households structural changes on consumption and savings", *Research Report* No.248, Development Bank of Japan. (in Japanese)

Kintner, Hallie J., Thomas W. Merrick, Peter A. Morrison and Paul R. Voss (eds.), (1994) *Demographics: A Casebook for Business and Government*, 1st ed., Boulder, Westview Press, (1997, 2nd ed., Santa Monica, RAND Corporation).

Konishi, Yukiko（2001）Backgrounds of the sluggish private consumption: Household consumption behavior by Age and Family Type, *Dai-Ichi Kangyo Research Institute Review* No.2, Dai-Ichi Kangyo Research Institute.

Lazer, William (1994) *Handbook of Demographics for Marketing and Advertising*, 1st ed., New York, Lexington Books.

Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau (2002a-2008a) *Annual Reports on the Family Income and Expenditure Survey*.

Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau

(2002b-2008b) *Annual Report of the Consumer Price Index*.

Ministry of Internal Affairs and Communications of Japan, the Statistics Bureau (2009) *National Survey of Family Income and Expenditure*.

Murdock, Steve H. and David A. Swanson (eds.) (2008) *Applied Demography in the 21st Century*, 1st ed., Springer Science+Business Media.

Muto, Hiromichi and Harada Nobuyuki（2002）「Low fertility , Ageing and Consumption Frontier, *JCER Discussion Paper* No. 79, Japan Center for Economic Research. (in Japanese)

National Institute of Population and Social Security Research (2002) *Population Projections for Japan: 2001-2050*

National Institute of Population and Social Security Research (2006) *Population Projections for Japan: 2006-2055.*

National Institute of Population and Social Security Research (2008) *Household projections for Japan: 2005-2030*

Pol, Louis G. (1987) *Business Demography: A Guide and Reference for Business Planners and Marketers*, 1st ed., Westport, Quorum Books.

Pol, Louis G., and Richard K.Thomas (1997) *Demography for Business Decision Making*, 1st ed., Westport, Quorum Books.

Rao, K. Vaninadha and Jerry W. Wicks (eds.) (1994) *Studies in Applied Demography: Proceedings of the International Conference on Applied Demography*, 1st ed., Bowling Green, Population and Society Research Center, Bowling Green State University.

Siegel, Jacob S. (2001) *Applied Demography: Applications to Business, Government, Law, and Public Policy*, 1st ed., San Diego, Academic Press.

Suzuki, Reiko (1990) "Analysis of benefits and burdens by individual specific generational accounting: problems on perspective of the structure of generational transfer"*JCER Discussion Paper* No. 59, Japan Center for Economic Research. (in Japanese)

Wada, Kohei (2002) "Forecast of influence that below-replacement fertility, aging exert on macro economical family consumption", *Research on Household Economics (Kakei-keizai-kenkyu)*, Vol.54, Institute for Research on Household Economics. (in Japanese)

Wada, Kohei (2005) "Influence of population decline on consumption and investment" in Hiroshi Ohbuchi and Hiroyuki Kanekiyo (eds.) *Socio-economics of Below-replacement Fertility*, Chapter 3, Harashobo. (in Japanese)

Wada, Kohei (2006) "Consumption market and population decline, aging" in Hiroshi

Ohbuchi and Jin Morioka (eds.) *Japanese Economy in the era of Population Decline* , Chapter 3, Harashobo. (in Japanese)

Wada, Kohei (2007) "Cohort analysis and identification problem", *The Journal of Economics (Keizaigaku-ronsan)*, Vol.47,No.3-4, The Society of Economics in Chuo University. (in Japanese)

Wada, Kohei (2010) "Demographic Structural Changes and the Impact to Consumption Market in Japan", *The Journal of Economics (Keizaigaku-ronsan)* Vol.50, No.5-6, The Society of Economics in Chuo University.