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Effects of Pension Payments on Savings in the Philippines

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Effects of Pension Payments on Savings in the Philippines

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ABSTRACT

This paper attempts to provide some empirical evidence on the effects of social security on savings mobilization of households. While it has been empirically established in developed countries that pension system has important effects on savings, no important study has been established yet in the Philippines. Following Feldstein's model, consumption and savings function using a household survey data was estimated. This study aims to contribute to the pension literature by using the Kaplan-Meier duration model to estimate survival probabilities. The findings indicate that there is a negative effect of pension on household savings. The Social Security System and the Government Service Insurance System are viewed by current contributors as future wealth and thus, they tend to consume more now and save less than they would have if there were no pension.

1. Introduction

The paper asks this question: what is the impact of pension membership to household savings in the Philippines? In particular, does membership in the pension system leads to increases or decreases in the accumulated savings of the households?

Finding answers to this question is important for the Philippines where savings has stagnated over the years. In the 1960's, domestic savings rate averaged above 20 percent of GDP making it one of the highest in Asia. At present, the country's savings rate is hovering at 12 to 15 percent

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while the level for East Asian countries is 25 to 30 percent of GDP. Low savings contributed to the country's snail-paced economic growth compared to the rest of the region.

It has been empirically identified that the pension system has important effects on savings (Liebman and Feldstein, 2001). Most studies, however, focus on developed countries particularly, the United States. Using Feldstein's model on a household dataset with information on pension membership, this study aims to examine the effect of pension system on savings in the Philippines, where no important study has yet been established (Templo, 2002).

2. Review of Literature

Among the three theories of savings, the most commonly used theory to study the effect of mandatory pension programs on savings is the Life Cycle Hypothesis (LCH). The LCH emphasizes that income varies over an individual's life and through saving, an individual is allowed to smooth their income so that consumption will be the same regardless of whether income is high or low. Individuals are thus arranging their lifetime patterns of consumption to completely exhaust their available wealth. Savings, therefore, varies over an individual's lifetime—typically, a person dissaves before he is capable of working, accumulates savings during working years, and dissaves again after retirement. In the aggregate level, a country with a high working population means that savers outnumber the dissavers so that saving is generated in the country. An introduction of a mandatory pension program has the same effect as having a payroll tax in the first period to be able to pay for retirement in the second period. To see the effect of pension on savings, net social security wealth (net present value of benefits minus the value of contributions) has to be determined (Liebman and Feldstein, 2001).

Given the assumptions of the simplest LCH holds, the levels of social security can affect an individual decision in the following manner (Table 1). First, if net social security wealth (SSW) is zero, the individual would reduce his saving aside from pension by the same amount as his contribution, leaving the intertemporal budget constraint unchanged. When net SSW is negative, ordinary savings account would be reduced by less than the pension contribution and thus total saving would increase. However, when net SSW is positive, his ordinary savings would decline

by more than the amount of pension contribution since the intertemporal budget constraint is relaxed and the consumption on the two periods will rise.

Table 1. Pensions in the Life Cycle Model

Net Social Security Wealth	Effect on Savings
Zero	No effect
Negative	Decrease
Positive	Increase

There are, of course, departures from the simple model. Despite a positive SSW, total savings would increase if there are borrowing constraints, induced retirement, precautionary saving motives, and bequests.[1]

3. Empirical Specification

Following Feldstein (1974, 1978), the following consumption function is estimated in this paper:

$$C = \alpha + \beta_1 YD + \beta_2 SSW + \beta_3 AYD \qquad (1)$$

where C is consumption, YD is disposable income, SSW is social security wealth and AYD is age*YD.

A direct saving function of the following form,

$$S = \alpha + \beta_1 YD + \beta_2 SSW + \beta_3 AYD \qquad (2)$$

where S is the household savings, will be also estimated to test the consistency of estimates.

The study uses household observations to estimate consumption and savings function (equations 1 and 2) to see the effect of social security wealth on consumption and savings. The econometric specification focuses on the annual flow of savings rather stock of accumulated wealth.[2]

[1] Murphy and Musalem (2004) discuss these issues in more detail.
[2] Due to data limitations, this study modifies the model employed by Feldstein (1978) which focused on stock of accumulated wealth.

3.1 Descriptive Analysis of the Survey Data

In 2000, the World Bank and the Social Weather Stations conducted a national survey called Filipino Report Card to evaluate client perceptions of government services. The survey questionnaire included information regarding membership in the three pension schemes, namely, SSS, GSIS and PAG-IBIG fund as well as sources of family income and breakdown of expenditure. It also contains information on occupational data of the household head as well as other demographic variables. This information was used to estimate the social security wealth of each household.

From a total sample of 1,200 households, the present study uses the sub-sample of households (145 observations) in which there was a household head 40 to 64 years old who replied that they are currently contributors of SSS, GSIS and PAG-IBIG fund.[3] Majority of the sub-sample are contributors of SSS (93%) while only 14 percent are GSIS members. Of those contributing to both SSS and GSIS, 28 percent are also members of the PAG-IBIG provident fund (Table 2).

Table 2. Membership in Pension Schemes

	SSS	GSIS	PAG-IBIG Fund
Presently a member	133	20	41
Used to be a member	12	5	10
Never became a member	0	120	94
Total	145	145	145

SOURCE: author's calculations based on the Filipino Report Card.

Luzon (excluding NCR) had the most number of pension contributors, followed by Mindanao. In terms of distribution across provinces, members were more concentrated in Visayas than any other islands. Of the 30 members in Visayas, 21 came from Negros Occidental.

Eighty-three percent of the household heads are male and 81 percent of them are married. Slightly more than half are salaried workers while the rest are either employers, self-employed or property owners (Table 3).

[3] Outlier households were removed from the sample such as those with very high and very low monthly incomes as well as membership in the PAG-IBIG fund only.

Table 3. Job Status of Respondents

	Frequency	Percent
Hired workers (excluding unpaid family workers)	78	53.8
Employers and self-employed	64	44.1
Purely property owners (income mainly from rentals)	3	2.1
Total	145	100.0

SOURCE: author's calculations based on the Filipino Report Card.

Household consumption (C) was obtained by adding expenditures for food, utilities, transportation and communication, household operations, personal care and effects, clothing, education, recreation, medical care, furnishings, house maintenance, special occasions, gifts, purchase or amortization of property, installment payments for real property, vehicle and appliances, and other disbursements. Other expenditures such as tax payments, loans to others, bank deposits and investments, among others, were not included in this variable since they are not considered household consumption.

Since family income was also reported in the survey, savings was calculated by getting the difference between family income and household consumption. The value of household consumption that was subtracted with family income is different from the one defined above. Purchase or amortization of property and installment payments for real property, vehicle and appliances were further deduced from C since this can account as investment of the household. When the difference between family income and consumption less property payments (CP) was made, it was found that savings in most of the households are negative, which is shown in Table 4. Since it was likely that there was under-reporting of incomes, it was decided that C might be a better measure. Both variables, however, will be checked in the empirical model.

Table 4. Family Income, Consumption and Savings

	N	Minimum	Maximum	Mean	Std. Deviation
Yearly family income	145	8000	4800000	213544.79	465198.49
Consumer expenditure	145	55036	2112840	320376.95	280737.81
Saving	145	-1472040	3929360	-94553.70	406563.16

SOURCE: author's calculations based on the Filipino Report Card.

Each of the variables was reported using different time frames in the module (e.g. weekly for food expenditure, monthly for utilities, and six months for medical care). All these values were transformed to approximate yearly values.

Disposable income (YD) was defined as total yearly income minus income from property, pension and retirement income, transfers and help from relatives. Households whose main income sources were coming from property, pension and retirement income, transfers and help from relatives were excluded from the sample. YD includes wage and salary income, business income, service fee, and income from farming and fishing in 2000 (Table 5).

Table 5. Income Sources

	Frequency	Percent
Wages and salaries	84	57.9
Rentals of asset	4	2.8
Business income	55	37.9
Income from farming and fishing	2	1.4
Total	145	100.0

SOURCE: author's calculations based on the Filipino Report Card.

3.2 Estimation of Social Security Wealth

The value of social security wealth is evaluated for each observation. By definition, an individual's social security wealth is the value of the benefits for which he will be eligible at age 65 minus the taxes he will pay until then, discounted to the present with appropriate adjustment for actuarial survival probabilities.

In estimating the value of SSW, the benefit formulas for SSS, GSIS and PAG-IBIG are important. The benefit formulas for the following schemes are:

SSS: $PS = 300 + 20\%AMSC + 2\%(CYS - 10)AMSC$ (3)

GSIS: $PG = 37.5\%RAMC + 2.5\%(YOS - 15)RAMC$ (4)

where PS the monthly pension benefit for SSS, AMSC is the average of the last 60 monthly salary credits, and CYS is the number of credited years of service. The salary credits for each income level for employed and unemployed the same for SSS. PG is the monthly pension benefit for GSIS, RAMC is the revalued average monthly compensation of the last three years, and YOS is the number of years of service. The Pag-IBIG Fund pays a lump sum at the end of the contributory period, which is 4 percent (2 percent if self-employed) of 20-year's salary plus interest with annual interest earnings.[4]

These data are not available in the cross-section survey. Following Feldstein (1978) and Gultason, Korluri and Panik (1992), the benefit of each household head will be evaluated according to their age, job status, salary, pension scheme, as well as the abovementioned formulas. It will be assumed that the household heads started working at the age of 21. For instance, if a person is now 45 years old, then CYS or YOS would be assumed to be 24 years.

After PS or PG is estimated, the SSW can be calculated as follows:

$$SSW = \sum_{a=65}^{e} p_{t,a}(1+g)^{a-t}(1+d)^{t-a}PX + B(1+i)^{65-t}(1+d)^{-(65-t)} \qquad (5)$$

where ***a*** is the age after 65 until the time the contributor dies, ***t*** is his or her current age, $p_{t,a}$ is the probability that a person with current age *t* will still survive at the age of ***a***,
g is the growth rate of pension, ***d*** is the discount rate, ***PX*** is the pension benefit (which comes from either SSS or GSIS) and ***B*** is the lump sum benefit if the person joins the Pag-IBIG Fund.

The probability of contributor's survival ($p_{t,a}$) is crucial in the calculation of SSW. Two approaches will be employed in this paper. The first one uses Feldstein (1978) approach which assumed a probability of 1 until 100 years old. The formula therefore becomes,

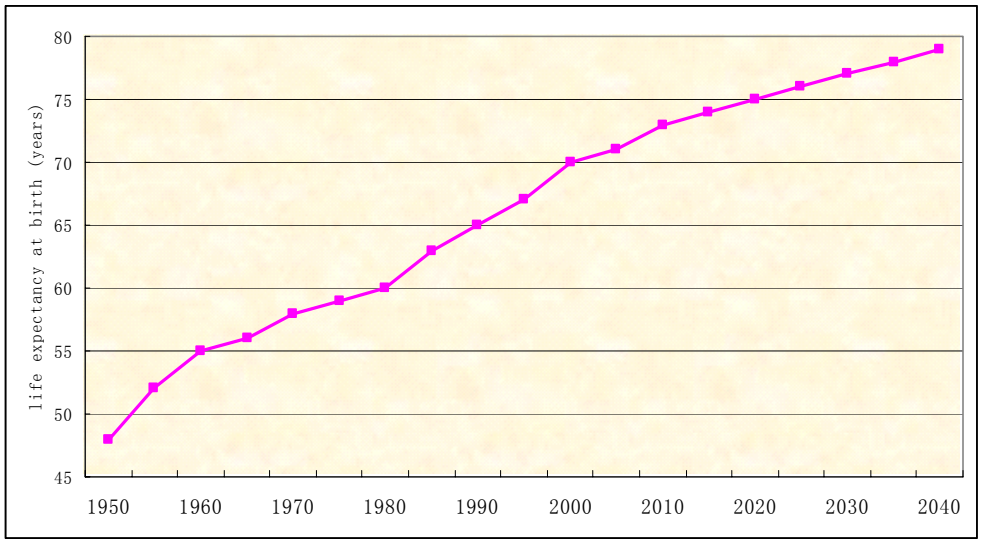
$$SSW = \sum_{a=65}^{100}(1+g)^{a-t}(1+d)^{t-a}PX + B(1+i)^{65-t}(1+d)^{-(65-t)} \qquad (6)$$

[4] For simplicity, the interest earning of PAG-IBIG was assumed to be 6 percent per annum which is similar to the promised interest rate of AFP-RSBS.

The second approach utilizes the Kaplan-Meier duration model to estimate survival probabilities so that the model will be more similar to reality.

According to Templo (2002), Human Development Report (2001) and Bloom (2005), the life expectancy at birth of Filipinos is 48 years in 1950, 56 years in 1965, 59.9 years in 1980, 66.3 years in 1995, 69.0 years in 1999, which can be shown in the following figure:

Figure 1. Life Expectancy in the Philippines



SOURCES: Templo (2002), Human Development Report (2001) and Bloom (2005)

In sampling the population, three age groups can be found: 40-49, 50-59, and 60-64. The average age and the percentage of each group are shown in Table 6.

Table 6. Age Cohorts

Age group	Frequency	Percent of cases	Mean of each group
40-49	67	45.5	44.04
50-59	59	41.4	54.10
60-64	19	13.1	61.95
Total	145	100.0	50.68

SOURCE: author's calculations based on the Filipino Report Card.

As a result, the life expectancy of group 60-64 (born in 1930s) can be assumed as 45 years, the life expectancy of group 50-59 (born in 1940s) can be assumed as 48 years, and the life expectancy of group 40-49 (born in 1950s) can be assumed as 50 years. Since the probability of survival for a pension fund is being calculated, it might make more sense to assume a higher life expectancy of the population as Feldstein did. In SSW calculation, life expectancies of all three groups are increased by 20 years and thus, the average of life expectancy for each group became 65, 68 and 70.

Three sample datasets are then generated, in which the starting ages are 40, 50 and 60, with life expectancies of 70, 68, and 65, respectively. The descriptive statistics of generated sampling dataset, survival function as well as survival probability of each age cohort are shown in the Appendix. The formula for SSW for the second approach becomes,

$$SSW = \sum_{a=65}^{99} p_{t,a}(1+g)^{a-t}(1+d)^{t-a} PX + B(1+i)^{65-t}(1+d)^{-(65-t)} \quad (7)$$

A moderate stance was taken in assuming the value of the growth rate of pension, ***g***. Although the growth rate of benefit for SSS was high for the past 20 years, it would not be the same way in the future (de la Paz, 2003). According to the president of the fund, there will be no such high growth in the future, and there has been no benefit increases since 2000. The fund proposes that the benefit should be adjusted only according to the inflation rate. Thus, it is assumed here that the growth rate of benefit is equal to the inflation rate. From 2000 to 2004, the average inflation rate is around 4.5 percent, which is assumed to be the growth rate of the benefit.

The definition given by Feldstein (1978) was adopted in the assumption of discount rate. Discount rate is the real interest rate which is the nominal interest rate less the inflation rate. According to Bangko Sentral ng Pilipinas, the deposit interest rate is averaged around 5.5 percent from 2000 to 2004 and therefore, the discount rate is 1 percent.

After these steps, the SSW is estimated and its descriptive statistics is shown in Table 7. Average benefits from SSS and GSIS are around 58,784.6 pesos per year, while the average benefits from Pag-IBIG are only 4,205 peso per year, which shows that the second pillar plays a major role in

the social security system in the Philippines. As shown in the table, there are huge differences between the Feldstein approach and the survival probability approach. For instance, the mean of total SSW with Feldstein approach is 6,861,881.21 pesos while the mean of total SSW with survival probability approach is around 1,644,690.04 pesos, almost 4 times the latter. The main reason for this discrepancy is the different treatment for the survival probability for a certain person after 65 years old. While Feldstein simply assumed that probability is one before 100, the survival probability approach with duration model generates probabilities for each age group with certain life expectancy. Both approaches are used here to examine the effects of SSW.

Table 7. Descriptive Statistics of SSW

	N	Minimum	Maximum	Mean	Std. Deviation
PAG-IBIG benefits	145	0	76971	4205.70	10446.59
Wealth from Pag-IBIG	145	0	63081	3513.84	8526.93
Benefits from SSS and GSIS (yearly)	145	0	450000	58784.60	58812.24
Feldstein Approach for Wealth from SSS and GSIS	145	.0	61828231.37	6858367.3	7505922.99
Survival Probability Approach for Wealth from SSS and GSIS	145	.0	14632579.83	1641176.20	1780563.69
Feldstein Approach for Total SSW	145	5828.6	61891312.74	6861881.21	7510848.41
Survival Probability Approach for Total SSW	145	5828.6	14695661.20	1644690.04	1785480.56

The study uses household observations to estimate consumption and savings function (equations 1 and 2) to see the effect of social security wealth on consumption and savings. The econometric specification focuses on the annual flow of savings rather stock of accumulated wealth.

4. Effects of Social Security Wealth

The results of regression for the consumption and savings functions imply that an increase in social security wealth increases leads to more consumption and a decline in savings.

Table 8 presents consumption function estimates while Table 9 presents the savings function estimates. The odd numbered equations show the parameters obtained using Feldstein's SSW approach while the even numbered equations use the survival probability approach in SSW

calculation. Equation 1 of Table 8 implies that a one peso increase in SSW will lead to 0.0076 increase in consumption. This is supported by the parameter in equation 1 of Table 9, which shows that a one peso increase in SSW will reduce savings by 0.0156.

Equation 2 uses the same specification as equation 1 except the SSW is obtained using survival probabilities. The effect in consumption and savings in this case is compared to the previous specification: for every one peso increase in SSW, consumption will increase by 0.0321 and savings will decrease by 0.646. Equations 3 and 4 added the marginal effects of income, however, it is only significant on equations 5 and 6 of the savings function estimation.

Table 8. Regression Results on Consumption Function

Equation	SSW1	SSW2	YD	$(YD/10)^2$	AYD	Constant	Adj R^2
1	0.0076[b]		0.6107[a]			195877[a]	0.2800
2		0.03211[b]	0.6110[a]			195345.1[a]	0.2802
3	0.0032		0.6109[a]	-0.0000600		169701.1[a]	0.2864
4		0.01360	1.3335[a]	-0.0000597		169573.6[a]	0.2864
5	0.0032		1.3385[b]	-0.0000568	-8.26E-08	169552.5[b]	0.2813
6		0.01360	1.3375[b]	-0.0000558	-1.03E-07	169388[a]	0.2813

NOTES: [a] 1% level of significance
[b] 5% level of significance.

Table 9. Regression Results on Savings Function

Equation	SSW1	SSW2	YD	$(YD/10)^2$	AYD	Constant	Adj R^2
1	-0.0156[a]		1.5824[a]			-175116.5[a]	0.3988
2		-0.0646[a]	1.5784[a]			-174810.7[a]	0.3977
3	-0.0105[c]		0.7504	0.0000688		-145065.0[a]	0.4018
4		-0.0429[c]	0.7286	0.0000703		-144501.7[a]	0.4010
5	-0.0106[c]		1.2880[c]	0.0005923[b]	-0.00001[c]	-169866.1[a]	0.4136
6		-0.04329[c]	1.2586[c]	0.0005913[a]	-0.00001[c]	-169139.6[a]	0.4126

NOTES: [a] 1% level of significance
[b] 5% level of significance
[c] 10% level of significance.

According to Feldstein, the life cycle theory implies that because older men generally worked longer and are closer to retirement, net worth shall increase with age. This was proxied in the regression by adding a variable that is a product of the household head age and labor income.

Estimates in equation 5 and 6 of Table 8 shows that age-income variable has no substantial effect on consumption. However, age it has a significant effect on savings—as age increases, savings also decreases.

Despite huge differences in the SSW values obtained using Feldstein approach and survival probabilities, the signs of coefficients were consistent. And even if other variables are added to the specification, the signs of the parameters did not change. The findings of this study are consistent with Feldstein (1974, 1978). This implies that in the case of the Philippines, social pension decreases savings allocation of households.

5. Conclusion

This paper asked whether participation in the pension system leads to increases or decreases in the accumulation of savings by the households. Using the information on pension system membership of the Filipino Report Card Survey, it was found that there is a negative effect of pension on household savings. This finding is alarming because the Philippines already has one of the lowest savings rate in Southeast Asia. It also implies that the SSS and the GSIS are viewed by current contributors as future wealth and thus, they tend to consume more now and save less than they would have if there was no pension. Thus, the current pension plans in the country serve their redistribution and social insurance functions but not savings mobilization. Creation of a voluntary individual retirement account might help facilitate savings mobilization for old age.

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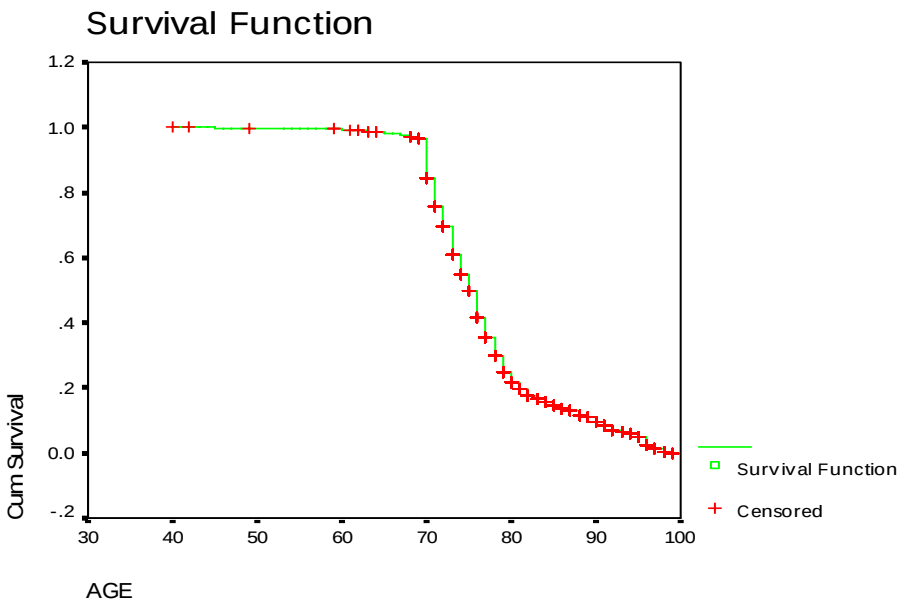
Appendix

Descriptive Statistics of Generated Sampling Dataset, Survival Function and Probability

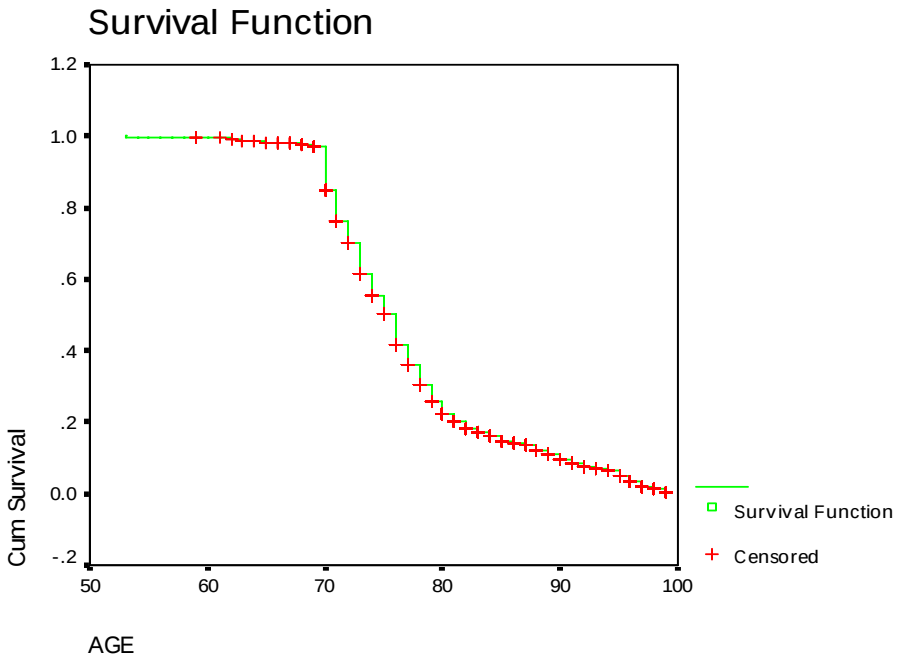
	Observations			Minimum/Maximum			Mean		
	40-49	***50-59***	***60-64***	***40-49***	***50-59***	***60-64***	***40-49***	***50-59***	***60-64***
Age	51044	50932	50751	40/99	50/99	60/99	76.39	76.46	76.54
Life expectancy	51044	50932	50751				69.94	67.67	64.99
Survival rate	51044	50932	50751	0/1	0/1	0/1	0.91	0.89	0.86

The Kaplan-Meier duration model is used to estimate the survival rate of this sample. The survival function for each group is shown in the following figures.

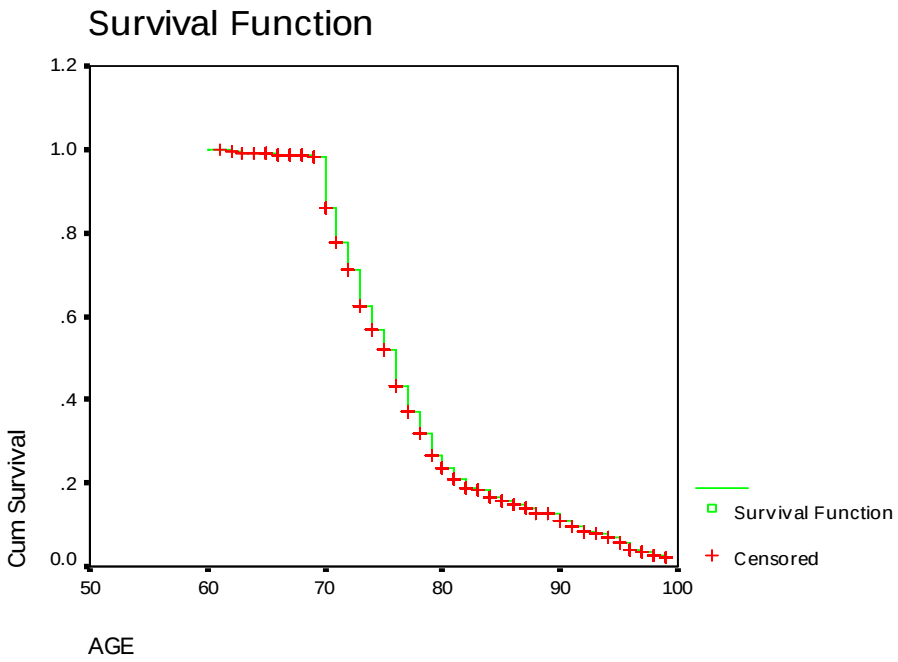
Survival function for ages 40-49:



Survival function for ages 50-59:



Survival function for age 50-59:



The probability of each group surviving at the age from 65 to 99 years is as follows:

Age	Survival probability for age 40-49	Survival probability for age 50-59	Survival probability for age 60-64
65	0.981053	0.983192	0.988591
66	0.978898	0.981149	0.987880
67	0.976213	0.978596	0.987010
68	0.972725	0.975375	0.985841
69	0.967512	0.971386	0.982723
70	0.841756	0.846268	0.859648
71	0.759630	0.764116	0.776660
72	0.695949	0.700059	0.711935
73	0.609694	0.613494	0.624307
74	0.547802	0.551458	0.565920
75	0.499691	0.504593	0.517826
76	0.413569	0.417893	0.431254
77	0.354699	0.358844	0.371303
78	0.297294	0.304618	0.316377
79	0.250144	0.256654	0.268159
80	0.217689	0.223354	0.233737
81	0.196058	0.201160	0.210511
82	0.175398	0.179963	0.188329
83	0.168704	0.173094	0.181140
84	0.155435	0.159480	0.166894
85	0.143988	0.148169	0.155057
86	0.138129	0.142140	0.148748
87	0.130370	0.134156	0.140393
88	0.115985	0.119353	0.127241
89	0.108839	0.112000	0.125281
90	0.094552	0.097298	0.108836
91	0.083554	0.085981	0.096177
92	0.071780	0.073865	0.084353
93	0.065959	0.068514	0.078243
94	0.060653	0.063003	0.078243
95	0.047167	0.048994	0.055951
96	0.026095	0.034559	0.040317
97	0.014271	0.021408	0.036535
98	0.002679	0.011825	0.027830
99	0.001072	0.004730	0.022264