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Adequacy of Retirement Wealth in Malaysia: Spending Behaviour Analysis

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Abstract

This paper aims to measure the retirement wealth adequacy among population in Malaysia based on 7743 samples from Household Expenditure and Income Survey (HEIS) 2014. The determinants of retirement wealth adequacy are also examined using the OLS regression. The HEIS2014 contains information on household income and expenditure data, together with socio-economic and demographic characteristics of each household head such as age, education level and occupational group. The retirement wealth adequacy is projected using a wealth-need ratio, which is equal to the projected wealth (or income) accumulated in working years divided by the projected total needs (or consumptions) in retirement years. A wealth-need ratio of equal or larger than one indicates that an individual's retirement wealth is adequate. Based on life cycle hypothesis which states that retirees should retire with a maintained lifestyle, a 70% replacement ratio is used in this study to project the total consumptions throughout retirement years. We also project the total consumptions by implementing different replacement ratios for different salary classes in Malaysia to take into account heterogeneity of consumptions among households. The results show that all households (or 100%) have wealth-need ratio of one or more if we use 70% replacement ratio. However, the percentage of households who have wealth-need ratio of equal or larger than one reduces to 88% when we use different replacement ratios for different income classes. The results from the wealth-need ratio indicates that the following demographic and socio-economic groups have higher percentage of adequate retirement wealth; age 30-35, single (not married), work in management field, degree education, live in region 4 (Pulau Pinang, Selangor, Kuala Lumpur, Putrajaya), and work in private sectors.

Keywords: Retirement wealth; Life cycle hypothesis; Replacement ratio.

1.Introduction

The population in Malaysia is experiencing a low fertility rate and at the same time, a high life expectancy. In 2016, women aged 15 to 49 in Malaysia have a fertility rate of 1.9 babies, which was the lowest since the 1960s. On the contrary, according to Department of Statistic Malaysia, the life expectancy for male and female in 2016 increased to 72.6 and 77.2, compared to 72.4 and 77.1 in the previous year. The decreasing fertility rate and the increasing life expectancy expose the population in Malaysia to the risk of demographic shift where the proportion of elderly dominates the young population. The increase in life expectancy may cause retirees to have longer retirement years, and thus, requiring them to accumulate more wealth to maintain their working lifestyle in their retirement years.

This study aims to examine the adequacy of retirement wealth in Malaysia by projecting the accumulated wealth and the total needs for civil pensioners and private sector retirees based on 7743 samples from HEIS2014. The retirement wealth adequacy is projected using a wealth-need ratio, which is equal to the projected accumulated wealth (or income) during working years divided by the projected total needs (or consumptions) during retirement years. A wealth-need ratio of equal or larger than one indicates that the retirement wealth is adequate. In this study, retirement wealth is defined as the accumulation of wealth throughout working years from a defined benefit plan (or pension scheme) for a government employee, or from a defined contribution plan (or Employee Provident Fund, EPF) for a private sector employee.

Retirement needs can be defined as an ideal consumption level during retirement years, which is estimated by multiplying the replacement ratio (RR) with the final salary prior to retirement. In other words, RR is a percentage of pre-retirement income that represents the desired consumption level during retirement. To cater for heterogeneity in consumptions among households, we also use different RR for different salary classes in Malaysia. The salary classes are divided into three income groups; top 20% (T20), middle 40% (M40), and bottom 40% (B40). A

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household who earns at least RM8,135 monthly belongs to the T20 group, earns within RM3,856-RM8,135 belongs to the M40 group, and earns less than RM3,855 belongs to the B40 group.

The life cycle hypothesis has been used by past researchers as a primary theoretical framework for examining the adequacy of retirement wealth. As an example, Lührmann (2010) utilizes the life cycle hypothesis to analyse 'consumption puzzle' in the early years of retirement among households in Germany, and found that consumption can be smoothed throughout the retirement years if work-related consumptions (consumptions that contribute a substantial amount in working years) are excluded. The life cycle hypothesis can also be used to estimate how much households should spend over their lifetime. The amount to be spent can be constructed using a spending ratio, which is the ratio of desired retirement consumption to working life consumption (Binswanger and Schunk, 2012). The life cycle hypothesis can also be extended to include several more factors or motivations for accumulating retirement wealth, such as motives of bequest and precautionary savings (Stephens and Unayama, 2012).

The most widely used indicator to determine the desired consumption in retirement years is the replacement ratio (RR), which is a ratio of consumption in retirement years compared to final consumption prior to retirement (Alaudin *et al.*, 2015; Bianchi *et al.*, 2016; Knoef *et al.*, 2014). Several ratios have been suggested as an indicator of the desired consumptions, such as Stephens and Unayama (2012) who used 80%, and Knoef *et al.* (2014) who suggested 70% or larger percentages. An individual needs to achieve a certain value of pre-retirement income to have an adequate retirement wealth (Cocco and Lopes, 2015). The use of retirement need, which is the ideal consumption in retirement years, contributes to a better estimation of retirement wealth adequacy (Maurer and Chapman, 2017). Therefore, the ratio of RR may vary, depending on the purpose. For instance, Cocco and Lopes (2015) used the ratio of gross income in retirement years to gross final income, Denton *et al.* (2011) utilized the division of after-tax retirement income to after-tax final income prior to retirement, and Chybalski and Marcinkiewicz (2016) and Kilgour (2017) used the ratio of total pension benefit to final income prior to retirement.

The RR was also suggested to vary according to household's income level. Such examples can be found inPurcell (2012) who used 65% RR for high income households and 90% RR for low income households, Binswanger and Schunk (2012) who suggested 45% RR for high income households and 95% for low income households in Netherlands, Metzger (2017) who suggested households with lower income to have higher RR, and Stephens and Unayama (2012) who found out that the effect of transition from saving behaviour to dis-saving behaviour leads to a substantial decrease in retirement consumptions among households with higher income. Several methods have been proposed as alternatives for RR. As examples, Chybalski and Marcinkiewicz (2016) used the Simple Synthetic Pension Adequacy Indicator (SPAI), which is the ratio of relative median income to at-risk-poverty rate, to compare pension adequacy among pension systems, and MacDonald *et al.* (2016) proposed the Living Standards Replacement Ratio (LSSR), which requires detailed data on after-tax income, savings, housing equity and other wealth, to analyse the standard of living after retirement.

2. Methodology

A total of 7743 sample data from HEIS2014 is utilized. The data is filtered based on age (age 23-60), occupational group, highest academic qualification, and nationality of each household head. The *Salaries and Wages Survey Report Malaysia (2010-2016)* is used to estimate the salary increment for private sector employees based on their highest qualifications, whereas the *Minimum and Maximum Salaries Index for Civil Servant (2016)* is used to estimate the final salary for public sector employees prior to their retirement age.

2.1 Retirement Wealth

In our study, retirement wealth is defined as pension income. A pension can be categorized as a "defined benefit plan" where a fixed sum is paid regularly to a person, or a "defined contribution plan" under which a fixed sum is invested and becomes available at retirement age (Holzmann, 2015).In Malaysia, the retirement wealth of a private sector employee is based on employee and employer contributions to Employees Provident Fund (EPF), which is categorized under the defined contribution plan. On the other hand, the retirement wealth of a government employee is based on monthly pensions and retirement gratuity under Kumpulan Wang Simpanan Pekerja (KWAP), which is categorized under the defined benefit plan. The accumulated EPF, P_{DC}, of a private sector employee at the age of retirement can be projected as:

$$P_{DC} = qW(1+r)^t\left(\frac{j^{t+1}-1}{j-1}\right) \qquad (1)$$

where $j=(1+d)/(1+r)$, q is the rate of EPF contribution from both employer and employee (which is currently at 23% in Malaysia), W is the gross monthly salary, r is the rate of salary increment, t is the number of years until retirement age, and d is the rate of EPF dividend. For a government employee, the formulas from PSD are applied to project the gratuity and monthly pensions at the age of retirement. The gratuity, G, is paid as a lump sum and is projected as:

$$G = 0.075nS \qquad (2)$$

where n is the number of months in service and S is the final salary prior to retirement. The monthly pension benefit, P_{DB}, is projected as:

$$P_{DB} = min\left\{\frac{1}{600}nS, 0.6S\right\} \quad (3)$$

where n is the number of months in service and S is the final salary prior to retirement.

2.2 Retirement Need and Adequacy ratio

In our study, retirement need is obtained by discounting the total retirement needs (or consumptions) in retirement years at the age of retirement. Based on the conceptual framework in Yuh (2011), the retirement need, TW, is projected as:

$$TW = a \times RR\left\{\frac{1-(1+i)^{-p}}{i}\right\} \quad (4)$$

where a is the final salary prior to retirement, p is the retirement years (starting from year of retirement until year of death), RR is the replacement ratio, and i is the real interest rate in retirement years. The expected age of death is obtained by referring to the Abridge Life Table 2017 by DOSM. The retirement wealth adequacy is measured by the wealth-need ratio, which is obtained by dividing the projected retirement wealth at retirement age by the projected retirement need at retirement age. A wealth-need ratio of equal or larger than one indicates that the retirement wealth of a retiree is adequate.

3. Results

The wealth-need ratio is projected based on the sample data, and the results show that all household heads (100%) have adequate retirement wealth. The results indicate that the accumulated EPF savings (without pre-retirement withdrawal) are adequate for private sector retirees, and the monthly pensions and gratuity are adequate for civil pensioners. The results also imply that all household heads have adequate retirement wealth if the 70% RR is used for all income classes. However, the results may differ if pre-retirement withdrawal (or other types of withdrawal) are included, or if different percentage of RR is utilized.

3.1 Different Level of Consumption Rate

The wealth-need ratio is also projected by implementing different RR for different income classes. Following Binswanger and Schunk (2012) who used 45% RR for high income households and 95% RR for low income households, we use 45% RR for households from income class T20 and 95% RR for income class B40. We also maintain 70% RR for households who belongs to income class M40. The results are shown in Figures 1-8. It can be seen that the following groups have higher percentage of adequate retirement wealth; life expectancies 30-35 (92%), single (90%), work in management field (99%), degree qualification (98%), Region 4 (96%), non-indigenous (91%), work in private sector (90%), and T20 and M40 income classes (100%).

Household heads with life expectancies 30-35 (middle age) are expected to have stable income and high savings compared to household heads with life expectancies 55-60 (young age), which resulted in higher percentage of adequate retirement wealth (Binswanger and Schunk, 2012). As for education level, household heads with degree qualification have better opportunity in getting jobs with stability and high salaries, and thus, are more likely to have higher accumulated wealth (Metzger, 2017). The overall results show that the percentage of households with adequate retirement wealth decrease to 88%. Based on income classes, 100% of households in the M40 and T20 income groups have adequate retirement wealth, but only 63% of households in the B40 income group have adequate wealth. The results show that 37% of B40 households are not able to maintain 95% of their pre-retirement salaries in retirement years. In other words, these households could not retire with a maintained lifestyle as they need to spend more on retirement necessities, such as food, housing and healthcare (Purcell, 2012). To increase their retirement wealth, additional savings in the form of investment in mutual funds should be considered (Alaudin *et al.*, 2015) It should be noted that the retirement wealth for private sector employees in the form of EPF savings are projected without considering pre-retirement withdrawals at age 50, withdrawal for purchasing a house, withdrawal for investment in mutual funds, and other withdrawals, and therefore, may over-estimate the accumulated wealth. Nevertheless, it is proven that the accumulated wealth in EPF is adequate for the M40 and T20 households who wish to retire with a maintained lifestyle (70% RR for M40 and 45% RR for T20), provided that they do not make any withdrawal from EPF savings in their working years.

3.2 OLS Results

Table 1 shows the results for the OLS regression, assuming that the RR is 70% for all classes. The dependent variable is wealth-need ratio, while the independent variables are household size, region, gross monthly income, life expectancy, education level, strata, occupational group, gender, net monthly income, expected time of death, and ethnicity. Significant variables at 0.001 level are household size, region (2 & 4), gross monthly income, educational level (SPM & others), strata, elementary occupation, female household head, expected time of death and ethnicity.

Meanwhile, life expectancies (40-60) and occupation (craft & repair, administrative support, sales & services) are significant at 0.05 level. Positive relationships are shown by households from Region 2 and 4, which are consistent with the findings from Figure 7, which show that households from Region 2 and 4 have higher percentage of adequate retirement wealth (92% and 96%). As for occupational groups, a negative coefficient shown by household heads who work in elementary occupation indicate that they are less likely to have adequate retirement wealth. Figure 2 also shows that household heads who work in elementary occupation have the lowest percentage of adequate retirement wealth (64%). The expected time of death has a negative relationship, which implies that the higher the expected time of death, the more likely the retirees will not have adequate retirement wealth.

4. Conclusions

This study has examined the adequacy of retirement wealth in Malaysia by projecting the accumulated wealth and the total needs for civil pensioners and private sector retirees based on 7743 samples from HEIS2014. Based on the projection results, all households (or 100%) have adequate retirement wealth using 70% RR. To deal with heterogeneity in income and consumptions, different consumption ratios (RR) are applied to different income classes in Malaysia, and the results reveal that the percentage of households with adequate retirement wealth decreases to 88%. The results from the OLS regression show that household heads from Region 2 and 4 have positive relationship with wealth-need ratio, but household heads working in elementary occupation and household heads with no specific education level (or others) have negative relationship with wealth-need ratio. It should be noted that the retirement wealth for employees in private sectors in the form of EPF savings are projected without considering pre-retirement withdrawals at age 50, withdrawal for purchasing a house, withdrawal for investment in mutual funds, and other withdrawals, and therefore, may over-estimate the accumulated wealth. However, we manage to show that the accumulated wealth from EPF is adequate for retirement with condition that no pre-retirement withdrawals are made in working years.

Fig-1. Percentage of adequate retirement wealth according to Life Expectancies

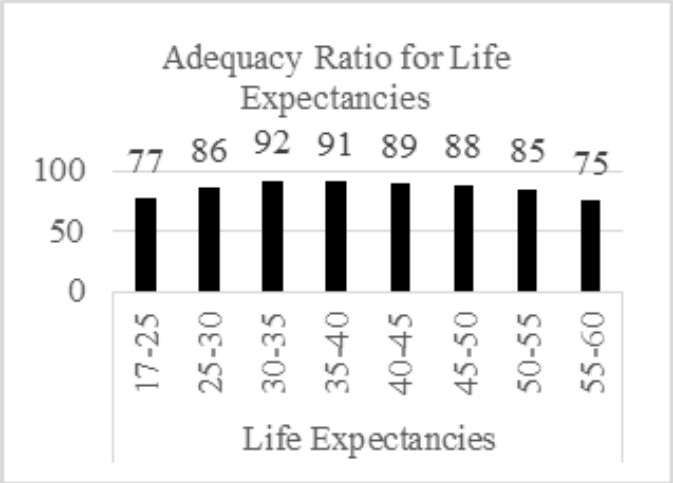

Fig-2. Percentage of adequate retirement wealth according to Occupational Group

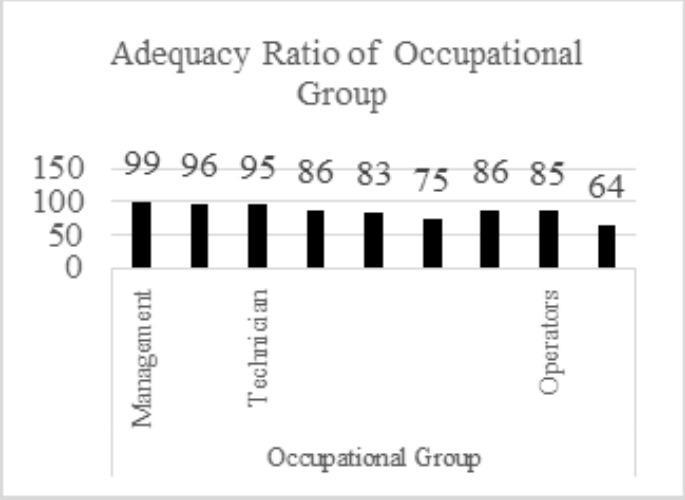

Fig-3. Percentage of adequate retirement wealth according to Type of Works

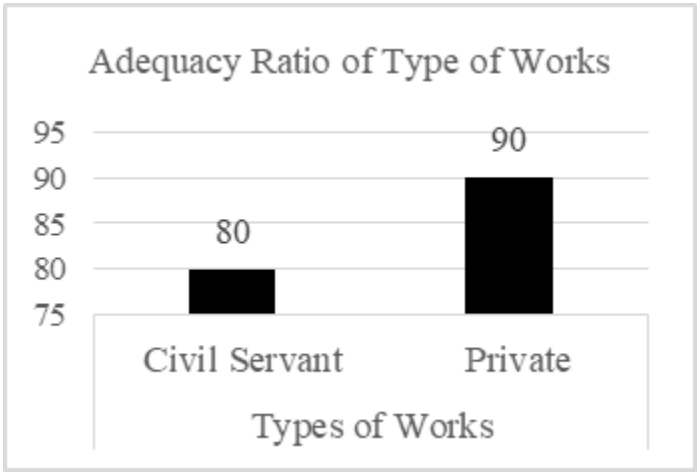

Fig-4. Percentage of adequate retirement wealth according to Marital Status

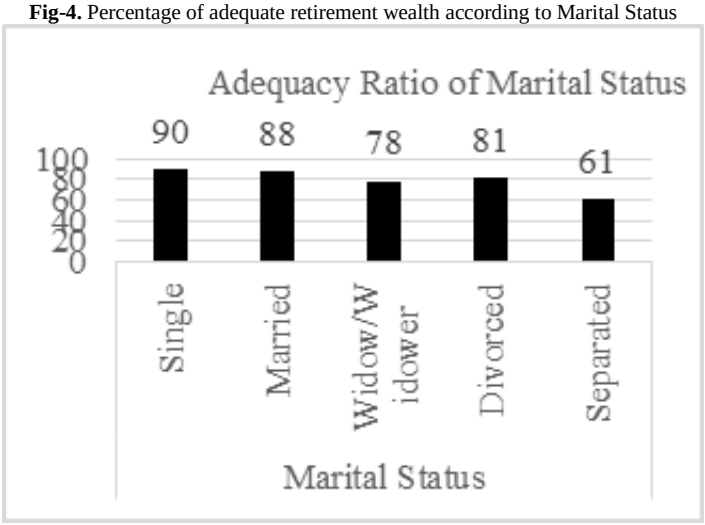

Fig-5. Percentage of adequate retirement wealth according to Ethnicity

Fig-6. Percentage of adequate retirement wealth according to Education Level

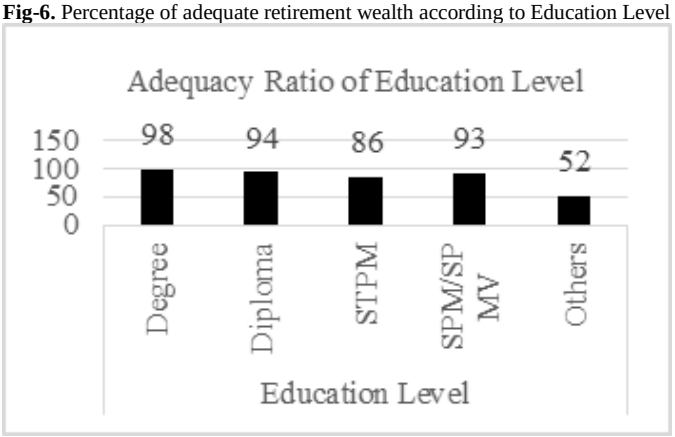

Fig-7. Percentage of adequate retirement wealth according to Region

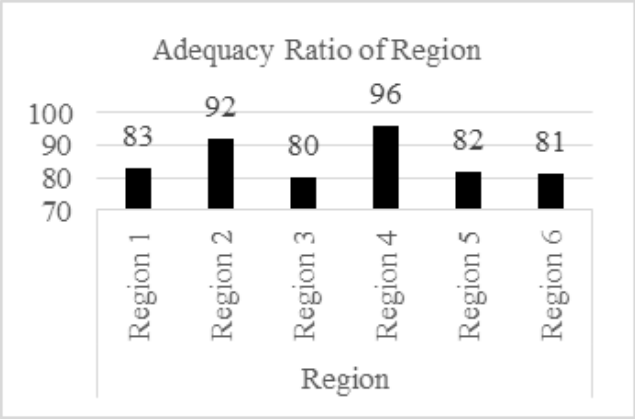

Fig-8. Percentage of adequate retirement wealth according to Income Class

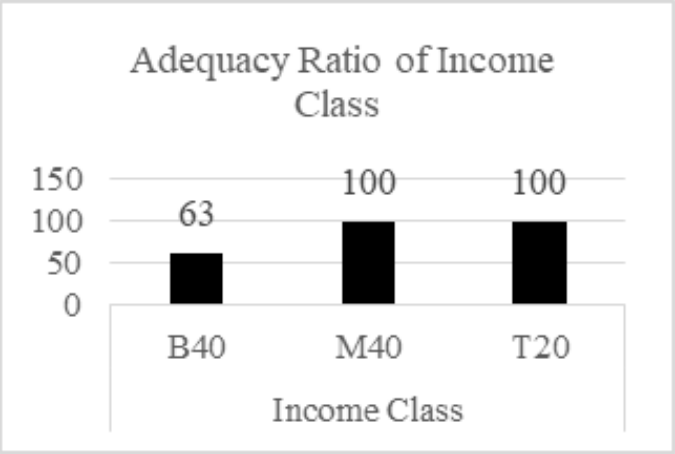

Table-1. Result of OLS regression

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	2.44	0.18	13.71	0.00	***
Size of Household	0.02	0.00	9.00	0.00	***
Region 1	Reference				
Region 2	0.05	0.01	3.793	0.00	***
Region 3	-0.02	0.01	-1.20	0.23	
Region 4	0.04	0.01	3.78	0.00	***
Region 5	0.02	0.01	1.43	0.15	
Region 6	-0.02	0.03	-0.64	0.52	
Gross Monthly Income	0.00	0.00	5.46	0.00	***
Life Expectancies 17-25	Reference				
Life Expectancies 25-30	0.00	0.01	-0.29	0.77	
Life Expectancies 30-35	0.00	0.01	0.04	0.96	
Life Expectancies 35-40	-0.02	0.02	-1.50	0.13	
Life Expectancies 40-45	-0.04	0.02	-2.87	0.00	**
Life Expectancies 45-50	-0.03	0.02	-1.76	0.08	
Life Expectancies 50-55	-0.05	0.02	-2.27	0.02	*
Life Expectancies 55-60	-0.10	0.05	-2.17	0.03	*
Degree	Reference				
Diploma	0.02	0.01	1.57	0.13	
STPM	-0.02	0.02	-1.03	0.30	
SPM/SPMV	0.05	0.01	4.08	0.00	***
Others	-0.32	0.02	-19.53	0.00	***
Strata	-0.03	0.01	-3.68	0.00	***
Managements	Reference				
Professionals	0.03	0.02	1.57	0.12	
Technician	0.03	0.02	1.58	0.11	
Administrative Supports	-0.04	0.02	-2.29	0.02	*
Sales and Services	-0.04	0.02	-2.17	0.03	*
Forest and Farmers	0.01	0.03	0.34	0.73	
Craft and Repair	0.05	0.02	2.63	0.01	**
Operators	0.02	0.02	1.27	0.20	

Elementary Occupations	-0.09	0.02	-4.66	0.00	***
Male	Reference				
Female	0.06	0.01	4.23	0.00	***
Net Monthly Income	-0.00	0.02	-0.14	0.89	
Expected Time of Death	-0.02	0.02	-9.85	0.00	***
Ethnicity	0.04	0.01	5.39	0.00	***
Residual standard error: 0.2798 on 7711 degrees of freedom					
Multiple R-squared: 0.2842, Adjusted R-squared: 0.2814					
F-statistic: 98.77 on 31 and 7711 DF, p-value: < 2.2e-16					

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