

Saving Determinants in Malaysia

(Penentu Tabungan di Malaysia)

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ABSTRACT

Saving is an important indicator of economic development where it is viewed as an element which finances domestic investment to achieve economic growth. The purpose of this paper is to examine the saving determinants in Malaysia. By using Life Cycle Model setting, this study employs a saving function which includes per capita income, rate of returns on savings deposit, government fiscal balance, young age dependency rate, and old age dependency rate and also inflation rate as the potential determinants of saving. The results showed that per capita income, rate of returns, old age dependency and inflation rate are the determinants of national savings while per capita income, rate of returns, government fiscal balance, young age dependency, old age dependency and inflation rate are the determinants for private saving in a long run. In a short run we found that per capita income, government fiscal balance and young age dependency are the significant determinants of national saving in a short run while private saving determinants are found to be per capita income, rate of return and young age dependency. Furthermore, variable ECM which indicates the speed of adjustment shows that more than 75% of the adjustment is completed in a year for national saving determinants, while more than 86% of the adjustment is completed in a year for private saving determinants. Results obtained in this study suggest that policy makers should monitor all significant variables since they give impact on the savings rate.

Keywords: life cycle model; economic development; national saving determinants; private saving determinants; error correction model (ECM)

ABSTRAK

Simpanan adalah indikator penting dalam mengukur pembangunan ekonomi kerana ia merupakan elemen penting dalam membiayai pelaburan domestik untuk menjana pertumbuhan ekonomi. Kajian ini bertujuan mengkaji faktor-faktor penentu simpanan di Malaysia. Dengan menggunakan Teori Kitaran Hayat, kajian ini menggunakan fungsi simpanan dengan pendapatan per kapita, kadar pulangan, belanjawan kerajaan, nisbah pergantungan golongan muda dan tua serta kadar inflasi sebagai pemboleh ubah penerang. Hasil kajian menunjukkan pendapatan perkapita, kadar pulangan, nisbah tanggungan tua dan kadar inflasi merupakan penentu utama kepada simpanan negara manakala pendapatan perkapita, kadar pulangan, belanjawan kerajaan, nisbah tanggungan muda, nisbah tanggungan tua dan kadar inflasi merupakan penentu simpanan swasta dalam jangka pendek. Pemboleh ubah ECM yang mewakili kecepatan pelarasan menunjukkan lebih daripada 75% daripada pelarasan bagi penentu simpanan negara manakala lebih daripada 86% bagi penentu simpanan swasta selesai dalam masa satu tahun. Hasil kajian mencadangkan supaya pembuat dasar lebih peka kepada pemboleh ubah-pemboleh ubah yang signifikan ini semasa menggubal dasar kerana ianya merupakan faktor penting yang mempengaruhi kadar simpanan.

Kata kunci: model kitaran hayat; pembangunan ekonomi; dominasi simpanan negara; penentu pelaburan swasta; model pembedahan ralat

INTRODUCTION

Saving is often being regarded as an important input in order to promote long run economic growth. Saving is a key vehicle that builds an economic connection among the past, the present and the future of a country. The amount of savings available in a country gives a limit on

the level of its gross investment and therefore limits its growth rate. Higher saving means that nations have large funds available for investment opportunities which can enhance the economic growth. Saving takes place when an individual consumption is less than their earnings. People save so that they are able to consume more in the future. The saving decision may depends on income,



wealth, real interest rate and other potential factors such as individuals habit, such as preferences for spending now, or postpone their consumption, so that they can have a greater consumption in the future period.

In order to encourage saving, government policies should be focusing in providing more incentives and opportunities to save by offering wide range of instruments. Therefore, McKinnon (1973) and Shaw (1973) suggested that financial system distortions should be eliminated or more specifically, financial liberalization should take place in order to encourage savers by offering them greater returns. However, the impact of financial liberalization is uncertain since deregulation policies may also eased borrowing constraints and may therefore discourage savings (Bayoumi 1993).

Therefore, the government should monitor other factors that affect savings in the economy and understand the framework that had been experienced so that an effective policy can take place to encourage savings, which eventually will enhance economic growth. It is important to note that, whatever the level of domestic savings and no matter how large or small the net transfer of foreign savings, the most important concern here is to ensure that those savings are allocated to investment in a manner that is efficient and important for the social, political and economic development. Apart from having a well-developed financial system, an appropriate infrastructure, human capital and institutions should also be in place.

The savings rate in Malaysia from 1993 to 2007 is depicted in Figure 1. From the graph, it could be seen that Malaysia's savings rate as percentage of GNP over the period 1993 to 2007 had been in the range between 30% and 43%. In the early period of 1993 to 1998, the graph shows that savings rate was experiencing positive improvement where it increased each year and reached the peak in 1998. However, trend for the period after 1998 shows a change in direction where there was a significant

decline in the savings rate. This decline continued until year 2002. This phenomenon might be due to economic recession experienced by Malaysia.

Malaysia had experienced a sharp recession in 1998 during the Asian financial crisis, which also hit other countries throughout the region, including Indonesia and Thailand. In 2001, Malaysia managed to avoid recession when its economy was negatively impacted by the bursting of the dot-com bubble that affected the ICT sector and the growth of its export markets.

After 2002, the savings rate started to show positive improvement since Malaysia has recovered from the crisis that hit. This graph suggests that there were some variables that drove the savings each year since the saving trends show a fluctuation. Therefore, it is relevant to study about the savings behavior in Malaysia and identify the policy that can be adapted by policymakers to encourage saving and indirectly enhance economic growth.

The resources for investments in Malaysia largely come from savings. Therefore, rather than discussing on how much people consume, it would be more interesting to discuss what factors induce people to save. Some might think that an increase in income would increase savings. However, an increase in income may increase the willingness to pay and therefore would increase one's consumption rather than their savings. Therefore, this is an interesting issue to be analyzed so as to understand the savings behavior in Malaysia.

LITERATURE REVIEW

Since understanding the determinants of saving is very important in designing effective policy interventions, the analysis of savings behavior has become one of the most important researches in order to help policy makers identify factors associated with savings. Masson, Bayoumi & Samiei (1998) found that increased in per

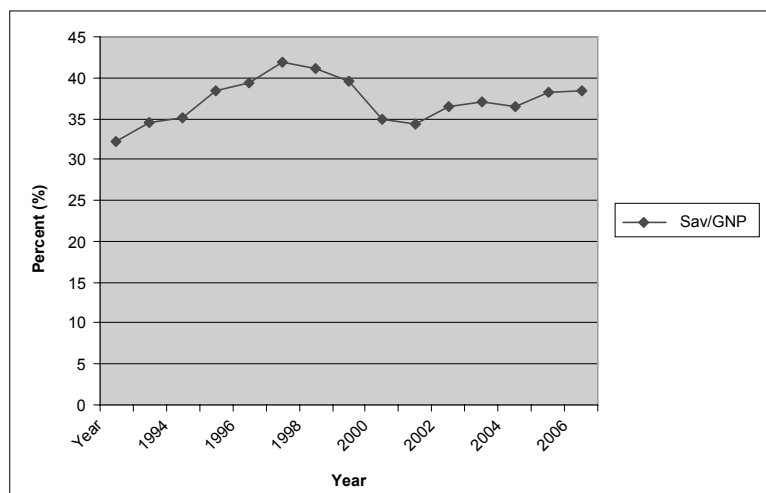


FIGURE 1. Savings Rate in Malaysia
Source: Economic Reports of the Ministry of Finance

capita gross domestic product would increase savings at low income levels (relative to the United States) but decrease it at higher ones. Edwards (1996) examined the determinants of savings rates by paying attention on Latin American countries in order to understand the low savings pattern in these countries. By using data from 36 countries, this study was based on international comparisons over the periods 1970 to 1992. The findings suggested that per capita income growth was the most important determinant of both, private and public savings.

Fry (1995) found that real interest rates had a positive significant effect on national savings by using a pooled cross-section time series data for fourteen Asian developing countries over the periods 1961 to 1983. On the other hand, Giovannini (1983) using the sample from the same countries, but covered a different sample periods, tried to reexamine Fry's work. His study found that real interest rate elasticity on savings rate was significantly negative.

Domenech, Taguas & Varela (2000) studied the effect of budget deficits on national savings in the OECD countries. They found that Ricardian Equivalence did not hold in their sample of the OECD countries since private savings had compensated only a fraction of budget deficit. On the other hand, Gale and Orszag (2004) who also analyzed the relationship between deficits and national savings revealed that there was a negative relationship between budget deficits and national savings. Based on the estimation, 1% increase in current deficit (in terms of GDP) reduced national savings in the range of 0.5% to 0.8% of GDP.

Loayza & Shankar (2000) who studied the evolution of the private savings rate in India during the periods 1960 to 1994 found that the private savings rate was negatively correlated with the dependency ratio. Kwack & Lee (2005) studied the role of demography in determining the savings rates in Korea using time series data from 1975 to 2002 found that the younger and the older age dependency ratios have negative effects on the savings rate, suggesting that the age structure of the population had an impact on aggregate savings rates.

Lahiri (1989) who studied the dynamics of savings in eight Asian countries found that inflation adversely affected the propensity to save. Koskela & Viren (1985) who studied a group of industrial countries found that savings increase as the inflation rate increase. Gupta (1987) who use pooled time series cross-section data found that, both expected and unexpected components of inflation had a positive effect on savings for a group of Asian countries. For Latin American countries, he found a negative relationship between unanticipated inflation and savings.

Athukorala & Sen (2004) studied the determinants of private savings in India by using annual data over the periods 1954 to 1998. Their findings suggested that inflation had a positive significant effect on domestic savings. The results also seemed to suggest that mild

inflation were conducive for private savings. Attanasion, Picci & Scorcu (2000) in their study of savings, growth and investments provided an analysis on the correlation among these three variables. They clearly considered a different sample and data frequency as well as different econometric technique in examining the relationship between savings rates and growth rates. They claimed that growth and savings seemed to be mutually and positively correlated.

Mohan (2006) employed Granger causality tests to investigate the relationship between domestic savings and economic growth for various economies with different income levels. The uniqueness of this analysis lied in its formulation where it divided the countries under investigation into three categories, that is, low-middle income, upper-middle income and high income countries. His results revealed that growth rate Granger caused the savings rate in 13 countries. However, the result was reversed for Indonesia and Singapore. On the other hand, five nations showed bidirectional causality.

Sinha & Sinha (2007) used Toda and Yamamoto causality tests to examine the relationship between per capita savings and per capita GDP for India over the periods 1950 to 2004. In their analysis, they divided the savings into three types, that is, household savings, corporate savings and public savings. Their findings suggested that there was no causality between per capita GDP with both per capita household savings and per capita corporate savings.

MODEL SPECIFICATIONS

Based on the discussion on the potential determinants of savings in the Literature Review, we have specified the savings function as in Equation (1).

$$\text{Savings} = f(Y, r, f, A, p) \quad (1)$$

The specification of the savings functions in Equation (1) drawn from the Life Cycle Model. In the life cycle setting, the two key determinants of savings are income growth and age structure. However, we use income level instead of income growth to represent the capacity to save. The model is also being modified by considering the effects of other potential explanatory variables that has been discussed in the previous section. The savings functions in Equation (1) shows that, savings is a function of per capita income (Y), rate of return (r), government fiscal balance (f), age dependency ratios (A) and inflation rate (p). Based on the savings functions, we finally specify the econometric model as below:

$$\text{NS}_t = \alpha_0 + \alpha_1 \text{INC}_t + \alpha_2 \text{ROR}_t + \alpha_3 \text{FIS}_t + \alpha_4 \text{YAGE}_t + \alpha_5 \text{OAGE}_t + \alpha_6 \text{INF}_t + \varepsilon_t \quad (2)$$

$$\text{PS}_t = \beta_0 + \beta_1 \text{INC}_t + \beta_2 \text{ROR}_t + \beta_3 \text{FIS}_t + \beta_4 \text{YAGE}_t + \beta_5 \text{OAGE}_t + \beta_6 \text{INF}_t + m_t \quad (3)$$

Based on Model 2 [Equation (2)] and Model 3 [Equation (3)], we modify our model by using log for the variable per capita income so that all the variables in our model can show its impact in terms of percentage. Therefore, the model will become as below:

$$NS_t = \alpha_0 + \alpha_1 \ln INC_t + \alpha_2 ROR_t + \alpha_3 FIS_t + \alpha_4 YAGE_t + \alpha_5 OAGE_t + \alpha_6 INF_t + \varepsilon_t \quad (4)$$

$$PS_t = \beta_0 + \beta_1 \ln INC_t + \beta_2 ROR_t + \beta_3 FIS_t + \beta_4 YAGE_t + \beta_5 OAGE_t + \beta_6 INF_t + \mu_t \quad (5)$$

where NS is a Gross National Savings (GNS) as percent of Gross Domestic Product (GDP), PS is a private savings as percent of Gross Domestic Product (GDP). $\ln INC$ is a log of per capita income, ROR is a rate of return on savings deposit, FIS is a government fiscal balance as ratio of Gross Domestic Product (GDP), YAGE is a young age dependency rate, OAGE is a old age dependency rate, and INF is a inflation rate. The expected coefficients are positive for α_1 , α_2 , and α_6 , β_1 , β_2 , and β_6 . The coefficient for α_3 , α_4 , and α_5 , β_3 , β_4 and β_5 are expected to be negative, and t is a time series data and ε_t and μ_t are an error term.

ECONOMETRIC PROCEDURES

In order to examine the relationship between the potential explanatory variables and the savings rates, we should first employ a unit root test before we can proceed with other econometric estimation method. In the next part, we will test for cointegration using Johansen & Juselius (1990) test for cointegration, while Error Correction Model (ECM) approach is used to analyze the speed of adjustment in the short run relationship.

UNIT ROOT TEST

Econometric theory requires all variables to be stationary if the regressions are to be realistic. Therefore, all variables in the savings function should be tested to determine whether they are influenced by economic factors of a relatively permanent nature or by self-correcting forces that indicate temporary elements in their dynamics. In this analysis, we will employ the unit root test, more specifically, using augmented Dickey-Fuller (ADF) tests to check the stationarity of the variables. It is an augmented version of the Dickey-Fuller test for a larger and more complicated set of time series models. The augmented Dickey-Fuller (ADF) statistic, used in the test, is a negative number. The more negative it is, the stronger the rejections of the hypothesis that there is a unit root at some level of confidence. In order to test it, we consider the equation as follows:

$$\Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \alpha_i \Sigma \Delta y_{t-1} + \mu_t$$

Where y_t is our variable of interest, Δ is the differencing operator, t is the time trend and μ is the

white noise residual of zero mean and constant variance. β_1 , β_2 , δ and α_i are the set of parameters to be estimated. Both the null and alternative hypothesis in unit roots tests are:

$$H_0: \delta = 0 \text{ (} y_t \text{ is non-stationary)}$$

$$H_1: \delta \neq 0 \text{ (} y_t \text{ is stationary)}$$

The H_0 hypothesis can be rejected if the t-test statistic from this test is negatively less than the critical value tabulated. In other words, a unit root exists in the series y_t (implies non-stationary) if the null hypothesis of δ equals zero that is not rejected (Gujarati 1995).

COINTEGRATION TEST

Given that the time series properties of the data are not stationary, one has to consider the long run relationship between the different time series to see whether there is a cointegration relation among the variables of interest. A series is said to be integrated of order d if one can obtain a stationary series by differencing the series for d times. Having established the stationarity of the data, we use the Johansen's (1988) and Johansen's & Juselius' (1990) approaches to test for a long run relationship among the variables.

ERROR CORRECTION MODEL (ECM)

According to the Granger Representation theorem, when variables are cointegrated, there must also be an error correction model (ECM) that describes the short run dynamics or adjustments of the cointegrated variables towards their equilibrium values. ECM consists of one period lagged cointegrating equation and the lagged first differences of the endogenous variables. In particular, ECM can be constructed by expressing changes in the dependant variables as a function of the level of disequilibrium in the cointegrating relationship (captured by the error correction term) as well as changes in other explanatory variables. The following error correction model is developed:

$$\Delta NS_t = a_0 + a_1 \Delta \ln INC_t + a_2 \Delta ROR_t + a_3 \Delta FIS_t + a_4 \Delta YAGE_t + a_5 \Delta OAGE_t + a_6 \Delta INF_t + a_7 ECM_{-1} + v_t \quad (6)$$

$$\Delta PS_t = a_0 + a_1 \Delta \ln INC_t + a_2 \Delta ROR_t + a_3 \Delta FIS_t + a_4 \Delta YAGE_t + a_5 \Delta OAGE_t + a_6 \Delta INF_t + a_7 ECM_{-1} + u_t \quad (7)$$

Where ECM is the error correction component and is the lagged estimated error series from Equation (4) and Equation (5) while v_t and u_t are the random error terms. From the regression analysis, we are able to interpret the coefficient for the explanatory variables and detect the sign. This approach will show us the speed of adjustment of our model in short run.

DATA

The data used in this study is annual time series data that covered the sample period for 30 years which from 1978 to 2007. This study uses yearly data on savings, Gross Domestic Product (GDP), per capita income, rate of return on savings deposit, government fiscal balance, age dependency ratio and inflation rate. The data are obtained from various sources including Annual Reports of Bank Negara Malaysia, Economic Planning Unit's website, Malaysian Treasury's website and also Economic Reports of the Ministry of Finance, Malaysia.

EMPIRICAL RESULTS

This section presents and discusses the empirical results for our analysis based on the Johansen & Juselius cointegration approach to derive the long run relationship between savings and the explanatory variables, while Error Correction Model (ECM) approach is used to see the short run adjustment. As a preliminary test, we first conducted the unit root test based on Augmented Dicky Fuller (ADF) approach and preceded with the cointegration test bound upon the Johansen and Juselius multi cointegration test to test for the existence of a long run equilibrium relationship among all the variables.

UNIT ROOT TEST

Stationary time series data is necessary to have a valid t-statistics. Therefore, it is a preliminary condition to test for unit root before we proceed with other econometric analysis. Results for the unit root test are presented in Table 1.

Table 1 showed that the t-statistics for all variables are statistically insignificant to reject the null hypothesis of non-stationary at any significance level. This result indicates that these series are non-stationary at level. Therefore, we conclude that these variables contain a unit root. When we conduct ADF test at first difference, the null hypothesis of non-stationary is rejected at 1% significance level and some of them are rejected at 5% significance level. Therefore, we can conclude that all the series are integrated of order one, $I(1)$.

COINTEGRATION TEST

Cointegration tells us about the presence of long run relation among two or more variables. When we go for cointegration analysis, we assume that all variables are non-stationary. Secondly they are all integrated of the same order. Even if the variables are not integrated in the same order, we still can continue with cointegration analysis. We used Akaike Information Criterion (AIC) to choose the optimum lag length for our cointegration analysis using Johansen-Juselius test. AIC is known for

TABLE 1. Results of the Unit Root Test

Variable	Level		First Difference	
	Constant	Constant & Trend	Constant	Constant & Trend
NS	-2.0875 (0.2507)	-2.2547 (0.4437)	-4.3334*** (0.0021)	-4.2304** (0.0124)
PS	-2.3849 (0.1570)	-2.7547 (0.2240)	-5.1536*** (0.0003)	-5.0826*** (0.0017)
lnINC	-0.2072 (0.9269)	-3.1000 (0.1250)	-5.7721*** (0.0001)	-5.6874*** (0.0004)
ROR	-2.2270 (0.2015)	-2.4631 (0.3423)	-4.6881*** (0.0008)	-4.5611*** (0.0058)
FIS	-1.8081 (0.3693)	-2.0330 (0.5596)	-4.1573*** (0.0032)	-5.5028*** (0.0007)
YAGE	-2.0548 (0.2633)	-1.8076 (0.6749)	-3.1759** (0.0337)	-4.7658*** (0.0064)
OAGE	-2.2944 (0.9999)	-0.0980 (0.9924)	-3.5359** (0.0143)	-6.5485*** (0.0000)
INF	-2.4764 (0.1313)	-2.7151 (0.2382)	-5.3709*** (0.0001)	-5.2451*** (0.0011)
NSAV	-1.8034 (0.9995)	-0.9933 (0.9998)	-3.5653 ** (0.0119)	-4.2352** (0.0146)
GDP	-1.2660 (0.9978)	-1.3292 (0.8600)	-5.2842*** (0.0002)	-5.9812*** (0.0002)

Note: ***, ** indicates the rejection of the null hypothesis of non-stationary at 1% and 5% significance level.

() indicates the t-statistic value

selecting the maximum relevant lag length (Shrestha & Chowdhury 2005). If we get one or more than one cointegrated vector in the model, we say that there a long run relationship among the variables exists.

NATIONAL SAVINGS

We will first perform the cointegration test where the dependant variable is national savings. The result for cointegration test for linear deterministic trend with restriction based on Trace statistic is reported in Table 2 while results for cointegration for linear deterministic trend with restriction based on Max-Eigen statistic is reported in Table 3.

Based on the cointegration test for linear deterministic trend with restriction, we found that Trace test indicates 3 cointegrating equations at 5% level and 2 cointegrating equations at 1% level. On the other hand, Max-Eigen value test indicates 2 cointegrating equations

at both 5% and 1% level. However, we prefer the results based on Eigen value test. Based on the results, we can conclude that there is a long run relationship among the variables.

PRIVATE SAVINGS

Using private savings as the dependant variable, we perform the cointegration test and report the result for linear deterministic trend with restriction based on Trace statistic in Table 4 while cointegration test based upon linear deterministic trend with restrictions based on Max-Eigen statistic is reported in Table 5.

Cointegration test for linear deterministic trend with restriction shows that there are 3 cointegrating equations at 5% level based on Trace statistic and Max-Eigen statistic. Therefore, we conclude that there is long run relationship among all the variables in our study.

TABLE 2. Cointegration test for national savings determinants with linear deterministic trend (restriction) base on Trace statistic

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	5% Critical Value	1% Critical Value
None**	0.974118	240.5869	146.76	158.49
At most 1**	0.860356	141.9229	114.90	124.75
At most 2*	0.699115	88.76920	87.31	96.58
At most 3	0.620515	56.34147	62.99	70.05

Note: Trace test indicates 3 cointegrating equations at 5% level and 2 cointegrating equations at 1% level

*(**) denotes rejection of the hypothesis at the 5% (1%) level

TABLE 3. Cointegration test for national savings determinants with linear deterministic trend (restriction) base on Max-Eigen Statistic

Hypothesized No. of CE(s)	Eigen value	Max-Trace Statistic	5% Critical Value	1% Critical Value
None**	0.974118	98.66392	49.42	54.71
At most 1**	0.860356	53.15373	43.97	49.51
At most 2	0.699115	32.42773	37.52	42.36
At most 3	0.620515	26.16142	31.46	36.65

Note: Max-Eigen value test indicates 2 cointegrating equations at both 5% and 1% levels.

*(**) denotes rejection of the hypothesis at the 5% (1%) level

TABLE 4. Cointegration test for private savings determinant with linear deterministic trend (restriction) base on Trace statistic

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	5% Critical Value	1% Critical Value
None**	0.989015	300.9169	146.76	158.49
At most 1**	0.887298	188.1355	114.90	124.75
At most 2**	0.869776	133.5602	87.31	96.58
At most 3**	0.796181	82.59778	62.99	70.05

Note: Trace test indicates 4 cointegrating equations at 1% level, (**) denotes rejection of the hypothesis at the (1%) level

TABLE 5. Cointegration test for private savings determinant with linear deterministic trend (restriction) base on Max-Eigen Statistic

Hypothesized No. of CE(s)	Eigen value	Max-Trace Statistic	5% Critical Value	1% Critical Value
None**	0.989015	112.7815	49.42	54.71
At most 1**	0.887298	54.57525	43.97	49.51
At most 2**	0.869776	50.96242	37.52	42.36
At most 3**	0.796181	39.76308	31.46	36.65

Note: Max-Eigen value test indicates 4 cointegrating equation at 1% levels. (**) denotes rejection of the hypothesis at the 5%(1%) level

NATIONAL SAVINGS DETERMINANTS

We regresses our model based on Equation 4 to analyze the determinants of national savings based on the chosen explanatory variables. We will employ cointegration test based on Johansen & Juselius multi cointegration test to analyze the long run impact of the chosen explanatory variables, that is, per capita income, rate of return on savings deposit, fiscal balance, age dependency and inflation rate on the national savings. On the other hand, Error Correction Model (ECM) is performed to analyze the short run adjustment.

COINTEGRATION ANALYSIS

We perform Johansen and Juselius cointegration test to analyze the long run relationship of our model. The results obtained are summarized in Table 6.

TABLE 6. Cointegration result for national savings determinants

Variable	Coefficient	t-statistic
lnINC	-75.4820***	24.9541
ROR	2.8675***	6.4176
FIS	0.2399	1.5468
YAGE	-1.8686	1.5292
OAGE	-22.0806***	6.0536
INF	2.7592***	5.9855

Note: *** indicates significant at 1% significance level

On the other hand, an Error Correction Model (ECM) can lead to a better understanding of the nature of any non stationarity among the different component series and can also improve longer term forecasting over an unconstrained model. We will satisfy all the OLS assumption of our causal ECM model. The result for ECM method is summarized in Table 7.

Based on cointegration method, we found that per capita income, rate of returns, old age dependency and inflation rate are important long run determinants of national savings rate. On the other hand, ECM approach shows that per capita income, fiscal balance and young age dependency are important short run determinants of national savings rate. Based on cointegration and ECM

TABLE 7. ECM result for national savings determinants

Variable	Coefficient	t-statistic	p-value
C	-1.7005	-0.7603	0.4555
D(lnINC)	-36.4715***	-7.0011	0.0000
D(ROR)	0.6241	0.6464	0.5250
D(FIS)	0.8134***	3.9242	0.0008
D(YAGE)	-6.3271**	-2.4338	0.0240
D(OAGE)	4.1489	0.3798	0.7079
D(INF)	1.4688	1.6829	0.1072
ECM(-1)	-0.7515***	-4.0297	0.0006

Note : ***,** indicates significant at 1% and 5% significance level

result, we will discuss each of the explanatory variables based on its impact on national savings individually.

Our analysis shows that per capita income has a negative impact on the savings rate. This is inconsistent with our expectation since we have been expecting that higher income would increase savings since individuals now have larger income to save and thereby should take the positive sign. This result also contradicts with other findings such as by Kuznets (1960). This phenomenon may be due to substitution effect between savings and consumption. With higher income, individuals would have the desire to consume more and in return, would not save. Moreover, individuals with higher income sometimes prefer to consume luxury goods to fulfilled their taste and preferences. This is a normal habit of Malaysian people who sometimes like to fight with others by consuming luxury goods as a symbol of their pride. Therefore, we get a negative sign for per capita income. However, the impact is not really large. In long run, based on the cointegration approach, 1% increase in income would lead to a decrease in savings rate of about 0.75%. On the other hand, short run adjustment based on ECM model shows that 1% increase in income in short run would decrease savings rate of about 0.36%. This variable is statistically significant at 1% significance level in both analyses.

Rate of return on savings deposit shows a positive sign in both long run and short run. It is consistent with other studied by Fry (1980). Result suggests that increase in rate of return would encourage people to save more since there is higher return on their savings that attract

people to save. Results show that 1% increase in rate of return would increase savings rate to about 2.87% in long run and about 0.62% in short run. However, this variable is only significant in long run with 1% significance level.

Government fiscal balance turns out to carry positive sign in both long run and short run analyses. This is not consistent with our prediction as we have been expecting that it should carry negative sign, since government mostly runs a budget deficit and thereby need to reduce their savings. Furthermore, this finding contradicts with other findings in the literature such as the study by Poterba & Summers (1987). This result turns out to be the opposite, may be due to private actions that act upon government's decision in running a deficit. This result turns to refute Ricardian Equivalence theorem empirically since this theorem claimed that an increase in government savings will have no effect on total savings, since it will be met by an equal reduction in private savings, and vice-versa if government runs a budget deficit. Result shows that 1% increase in fiscal balance would lead to an increase in savings rate of about 0.24% in long run while an increment of about 0.81% in short run. However, this result is statistically significant at 1% significance level only in short run.

Age dependency is one of the most important determinants of savings that is being discussed in the Life Cycle Model. Therefore, this variable is very important in our analysis. Since we divide the age dependency into two categories, that is, young and old age dependency, we can also divide its impact on savings. Young age dependency in both long run and short run, shows a negative sign and consistent with our prediction. Therefore, we can see that there is negative relationship between young age dependency and savings rate. This result is consistent with other findings by Kwack & Lee (2005). Results show that 1% decrease in young age dependency would lead to an increase in savings of about 1.87% in long run and an increase of about 6.33% in short run. This result is statistically significant at 5% significance level in short run while it is insignificant in long run.

Old age dependency shows a negative sign in long run while it is positive in short run. This situation may be due to a well organized pension system conducted in Malaysia for retired people to fulfill their consumption. Therefore, they depend less on the working population. However, in a long run, it turns into negative since this old population might have a high age longevity that makes them lack of income in long run. Result shows that 1% decrease in old age dependency would increase savings rate of about 22.1% in long run. On the other hand, 1% increase in old age dependency would increase savings rate of about 4.15% in short run. However, this result is only significant in long run with 1% significance level while it is insignificant in short run.

The variable inflation rate carries a positive sign as being expected. Therefore, there is positive relationship between inflation and savings rate. Based on the results,

1% increase in inflation rate is expected to increase savings rate of about 2.76% in long run and 1.47% in short run. However, this result is only significant at 1% significance level based on the cointegration approach while it is insignificant based on ECM approach for short run adjustment.

Finally, the variable ECM represents the speed of adjustment base on the ECM model. It shows that more than 75% of the adjustment is completed in a year due to short run adjustment. This result fulfill its condition by carrying a negative sign and also significant at 1% significance level.

PRIVATE SAVING'S DETERMINANTS

To analyze determinants of private savings based on the chosen explanatory variables, we shall regress our model based on Equation (5). Cointegration test bounds upon Johansen & Juselius multi cointegration approach will be performed to analyze the long run impact of per capita income, rate of return on savings deposit, fiscal balance, age dependency and inflation rate on the private savings. Furthermore, short run adjustment was being analyzed using the Error Correction Model (ECM) approach.

COINTEGRATION ANALYSIS

The result for our analysis based on Johansen & Juselius cointegration approach is presented in Table 8 while Table 9 summarized the result obtained based on ECM approach.

TABLE 8. Cointegration result for private savings determinants

Variable	Coefficient	t-statistic
lnINC	51.8559***	10.9352
ROR	17.4212***	10.0815
FIS	1.3998***	3.4499
YAGE	7.4361***	3.2368
OAGE	60.2947***	9.3299
INF	25.8749***	16.6594

Note: *** indicates significant at 1% significance level

TABLE 9. ECM result for private savings determinants

Variable	Coefficient	t-statistic	p-value
C	-3.3403	-1.6327	0.1174
D(lnINC)	-26.5780***	-5.0389	0.0001
D(ROR)	-2.4278**	-2.6026	0.0166
D(FIS)	0.2267	1.0307	0.3144
D(YAGE)	-6.4669**	-2.6814	0.0140
D(OAGE)	5.5981	0.4827	0.6342
D(INF)	-1.1623	-1.3436	0.1934
ECM(-1)	-0.8676***	-5.0059	0.0001

Note : ***,** indicates significant at 1% and 5% significance level

Based on cointegration method, we found all the explanatory variables, that is, per capita income, rate of returns, fiscal balance, young age dependency, old age dependency and inflation rate are important long run determinants of private savings rate. On the other hand, ECM approach shows that per capita income, rate of returns and young age dependency are important short run determinants of private savings rate. Based on cointegration and ECM result, we will discuss each of the explanatory variables based on its impact on private savings rate individually.

Result shows that per capita income carries a positive sign in the long run while short run analysis shows a negative sign. This negative sign for the short run analysis contradicts with our prediction that expect a positive sign for per capita income since higher income may be translated into higher savings for future use. The situation occurs may be due to private saver preference to consume now rather than postpone their consumption into future. This may be a natural reaction since higher income may lead people to use more luxury goods as to maintain their pride. This phenomenon is normal among Malaysian citizen. However, the impact is not really large. On the other hand, long run analysis seems to follow the prediction since in a long run, individuals can adjust their consumption and save more for their future use. Based on cointegration method, we found that 1% increase in per capita income would lead to an increase in private savings rate of about 0.52% in long run while there are expected to decrease in about 0.27% in short run. This variable is statistically significant at 1% significance level in both analyses.

Rate of return on savings deposit shows a positive sign in long run while it turns out to show a negative relationship based on short run analysis. This result is statistically significant at 1% significance level in long run while it is significant at 5% significance level in short run. Result shows that 1% increase in rate of return would lead to an increase in private savings rate of about 17.4% in long run. On the other hand, short run analysis shows that 1% increase in rate of return would lead to a reduction in private savings rate of about 2.43%. Negative relationship found in short run shows that income effect dominates the substitution effect where there is an increase in relative income that induces people to increase their current consumption. However, individuals might adjust their consumption that results in a positive impact on private savings in long run.

Government fiscal balance carries a positive sign in both long run and short run analyses and therefore not consistent with our prediction. Furthermore, this result contradicts with other findings such as by Poterba & Summers (1987). This result turns out to be the opposite, which may be due to private actions that act upon government's decision in running a deficit. This result turns to refute Ricardian Equivalence theorem empirically since this theorem claimed that an increase in government savings will have no effect on total savings, since it

will be met by an equal reduction in private savings and vice-a-versa, if the government runs a budget deficit. Result shows that 1% increase in fiscal balance would lead to an increase in private savings rate of about 1.4% in long run while an increment of about 0.23% in short run. However, this result is only significant in long run based on the cointegration approach at 1% significance level.

The variable young age dependency found to be consistent with our predictions in short run by taking negative sign while it is inconsistent based on long run analysis since it carries a positive sign. This result is statistically significant at 1% significance level in the long run and significant at 5% significance level in short run. Result shows that 1% increase in young age dependency would lead to an increment on private savings rate of about 7.44% in long run. On the other hand, 1% increase in young age dependency is expected to decrease private savings rate of about 6.5% in short run. In short run, individuals might experience decrease in their savings since they need to support the young generation. However, in long run there are more government's actions that give aids for the young generation such as scholarship, so that they are less depended on the working population. Therefore, we might see a positive impact in the long run.

On the other hand, old age dependency variable shows a positive sign in both analyses. This outcome contradicts with our prediction of negative sign since we expect that, higher old age dependency rate means that the working population needs to take care of their parents and thereby will reduce the savings rate. This outcome may due to a well organized pension and retirement system in Malaysia which fulfilled the needs of the retired person. Furthermore, old age population may have wealth that they had accumulated when they were in working period. However, the result is only significant in long run with 1% significance level. Result shows that 1% increase in old age dependency would lead to an increase in private savings rate of about 60.3% in long run and 5.6% in short run.

Inflation rate carries a positive sign in long run analysis while it turns to be negative in short run. Long run analysis seems to follow other findings by Koskela & Viren (1985). Negative sign found in short run may due to people's reaction who takes time to react to the information and to fully adjust in long run. Based on the results, 1% increase in inflation rate would increase private savings rate of about 25.9% in long run while 1% increase in inflation would lead to a decrease in private savings rate of about 1.17% in short run. However, this result is only significant in long run at 1% significance level.

Finally, the variable ECM shows the speed of adjustment based on the ECM model. We found that about 86% of the adjustment is completed in a year due to short run adjustment. This result fulfill its condition by carrying a negative sign and also significant at 1% significance level.

COMPARISON BETWEEN NATIONAL AND PRIVATE SAVINGS DETERMINANTS

Based on our analysis for long run and short run determinants of savings, we found that there are different findings based on national and private savings. For long run analysis, only rate of returns, fiscal balance and inflation rate is consistent for both national and private savings determinants. On the other hand, per capita income, young age dependency and old age dependency seem to show opposite direction when we compare for national and private savings.

We found that per capita income has a positive relationship with private savings while it gives negative impact on the national savings. This phenomenon may occur because only the private sectors that act to increase their savings given that there are increases in their income. On the other hand, although per capita income increase, the public sector is not being affected since their goals is more on developmental goals in order to fulfill the needs of the population as a whole. Therefore, the results might differ for national savings as compared to private savings.

Young age dependency seems to give a positive impact on private savings while it turns to affect the national savings with negative influence. Positive impact for private savings may due to the young age population to be taught by their parents to save money since young. Furthermore, there are many benefits for this age group since there are many government supports such as scholarship and other aids that could actually reduce the burden of the parents, resulting in a positive impact on private savings rates. On the other hand, overall effect can be seen where we found negative impact on the national savings rates. This may due to the government's support for young population, such as more schools and public places are being build to fulfill their needs, text book and other utilities in school are provided, scholarship and also other government's aids which eventually increase the expenditure of the public sector, and indirectly give influence on its savings. Therefore, we found that young age dependency rate has negative influence on national savings.

Another interesting finding is that old age dependency has positive impact on private savings while it shows negative influence on national savings. This result may occur since old generations usually have large amount of wealth from their retirement and also accumulated wealth from their working period. Therefore, we can see that it has positive impact on private savings rates since they can save more. However, we found a negative influence on the national savings since there are many government aids provided for the old generation. More old generation population might be a signal for the government to increase the place of living for them since they might be abandoned by their child who does not want to take care of them. Furthermore, there might be a longevity problem since old age person now may have a higher lifespan since many cures for diseases have been found. Moreover, there are other government subsidies

for this group such as discount for certain services, subsidies for driving license and also other aid that actually increase the burden of the public sector which finally resulted in a decrease in national savings.

Based on short run analysis, we found that rate of returns and inflation rate are not consistent since they carry a different sign in comparison between national and private savings. For rate of returns, we found that it has negative influence on private savings while it shows positive impact on national savings. When there are an increase in rate of returns, people experience the increase in their wealth and thereby might consume more rather than increase their savings. However, government might increase their savings so as to exert influence on the rate of returns to further increase, so that it would become more attractive to the depositors. Therefore, we found the opposite impact.

Based on the findings for private savings determinants, we found that increase in inflation has negative impact on private savings since they may expect a drop in the value of their savings as it is associated with the inflation. On the other hand, the public sector might think that it is better to reduce the expenditure and save more so that they can try to control the inflation from becoming worse. Since increase in public savings outweighs the decrease in private savings, we found positive impact on national savings.

As a final comparison, we can say that private and public sector have different goals when choosing to consume or save. Therefore, we found different impact for private savings and national savings determinants.

CONCLUSION AND POLICY IMPLICATIONS

In this study, we have examined the determinants of national savings and private savings over the periods 1978 to 2007. Since savings is one of the channels that spur the economic growth, we are interested to analyze its determinant. Furthermore, question of what determines its level is still unclear and remains as a crucial research and policy agenda. Lack of savings in a country would exert a negative influence on the economic growth since Malaysia mostly financed its investments using savings. The situation may be improved if savings is given special consideration in developmental research in the countries. The scarcity of information on savings behavior in Malaysia is a constraint for the policymakers when designing a policy to mobilize savings.

The main objective of this study is to examine the savings behavior in Malaysia. The variables chosen in this analysis is guided by theoretical framework based on Life Cycle Model and also based on previous research. The key variables analyzed are per capita income, rate of return on savings deposit, government fiscal balance, age dependency rate and also inflation rate. We have separated the age dependency into two parts, that is, young age dependency and old age dependency so that

we can better analyzed the impact of age structure on savings rate. We use Johansen & Juselius cointegration approach to examine the long run relationship while ECM approach is used to see the speed of adjustment in the short run.

Based on our results for long run analysis, we found that per capita income, rate of return, old age dependency and inflation rate have a statistically significant impact on national savings while government's fiscal balance and young age dependency turn out to be insignificant in explaining the national savings rate. On the other hand, short run analysis based on ECM model shows that only per capita income, government's fiscal balance and young age dependency show a statistically significant result while rate of return, old age dependency and inflation rate are found to be insignificant. The speed of adjustment in short run is also quite high based on the variable ECM.

For the determinant of private savings rate, we found that all the explanatory variables, that is, per capita income, rate of returns, government fiscal balance, young age dependency, old age dependency and inflation rate show statistically significant results. In short run, only per capita income, rate of return and young age dependency turn to be significant while government's fiscal balance, old age dependency and inflation rate show insignificant results. The result for ECM also shows that our model is well adjusted in short run.

In a policy context, this finding hope to bring awareness to the policymaker that savings is an important source for Malaysia's economic growth. Therefore, policies that encourage savings should be designated so as to enhance the economic growth in Malaysia. Furthermore, financial system in Malaysia should be developed towards mobilizing savings and ultimately contribute to economic growth since it is the important source for investments. Therefore, the policymakers should be geared towards promoting the savings as an alternative to promote economic growth. Therefore, the information based on our results on long run and short run determinants of savings can be used when designing a policy.

We have the choice of national savings and private savings determinants. However, we are more interested in national savings since our final goal is to increase the national savings. Policymakers have a choice of long run and short run policies or a combination of both in promoting savings. Based on the results, we can see that per capita income would affect national savings rate in both long run and short run. On the other hand, rate of returns, old age dependency and inflation rate only give influence in long run while fiscal balance and young age dependency would only affect national savings in short run. Therefore, policymakers should manipulate the significant variables to achieve its long run and short run goals.

Based on the result, we can see that per capita income is one of the factors that explain the savings rates in Malaysia. We have successfully found negative

correlation between per capita income and national savings. Increase in income makes people consume more, rather than save. Therefore, in order to encourage savings, the policymaker should control the consumption. Nowadays, we can see that it is easier for individuals to get credit card. This indirectly will increase their consumption and thereby reduce savings. Therefore, government should regulate the credit card providers by setting a higher requirement for people to get it, restrict people from holding many credit cards at one time and also restrict the credit card providers from giving a very high usage limit for the credit card holders since it would encourage people to consume without proper planning.

Young age dependency rate shows a negative influence on national savings in both long run and short run although results is only significant in short run. With more young age people, it would lead to a significant decrease in national savings rate. Therefore, it is important for the government to increase the awareness of the population to save especially among the kids by continuing their effort in promoting savings using savings campaign in school, utilizing the role of mass media by designing a program for kids to encourage them to save, more financial products for the kids and other savings programs that attract the young to save. Furthermore, high school students should be required to take basic economics subjects as basic knowledge so that they can use the knowledge for future use. All the government's efforts should be ongoing. When the message enters the subconscious and impacts the behavior of one generation, it is time to target the next generation.

On the other hand, old age dependency rate shows positive influence on national savings rate in short run but finally goes to the opposite in a long run. Most old age population's consumption is on healthcare since in this age they suffer from many kinds of health problems. Since old population often has quite a lot of wealth that they collect when they are in working period coupled with the retirement fund, they are sometimes more interested in using a private hospital as it provides better utilities and more customer friendly system. Therefore, policies should focus more on providing a better health system management, provide better utility in the government hospital, seminar for hospital staff in order to handle the patient and a campaign in healthy lifestyle so that they can consume less on health and therefore may increase their savings

The rate of return is other possible influence. The magnitude of its possible effect needs attention since its represent the degree of financial liberalization. Policymakers should allow bank to be more competitive and flexible by allowing more competition among them so that it can maximize the returns on savers. The banking industry also should be encouraged to offer variety of savings for people to make choices and also attract people by awarding them, such as lucky draw program for savers, since this kind of program is offered with limit in Malaysia. There is also a need to address the weaknesses of the

banking sector to enhance its credibility. Priority should be geared towards lessening the high level of non-performing loans (NPLs) of banks. The high NPLs tend to reduce the confidence of potential depositors in the ability of banks to honor their obligations. These also increase the spread between the borrowing and lending interest rates which make the returns on savings less attractive. Further liberalizing the banking sector would increase competition in the banking sector.

Financial institution, including insurance companies, unit trusts and other non-bank financial institutions need to continue developing innovative financial products that can meet the needs of savers. The availability of a wide range of savings instruments for savers and easily accessible instrument, for example, is a necessary condition for effective mobilization of the nation's savings. The ongoing evolution of an innovative, dynamic and diversified financial system in Malaysia will not only help Malaysians save, but also invest effectively for their future by facilitating the more efficient allocation of personal resources.

Besides that, education system is also a good alternative to promote a more-saving minded population. The capital market is not well developed since a huge proportion of the population is not aware that there are other forms of savings schemes aside from depositing the money in the bank. Government should manage and control the flow of information through education and mass media, as well as promote appropriate forms of savings. Different types of images may work for different ages and target populations. For example, an advertisement that shows an old person nearly 80 years of age still works conveys the message to the working population that it is a serious problem if they do not have savings. Message for the young generation should be in a simple way by using humor and cartoon characters to convey the message.

Government should also develop an award program to encourage financial literacy and bring even greater attention to notable efforts in financial education. Furthermore, government should give annual awards to individuals and organizations that make outstanding contributions to the field of financial literacy.

Besides all the options discussed, government may also analyze the policy to shift from income taxes to consumption taxes since this can control people from wasting money and indirectly stimulate savings. The experience of the other countries should also be analyzed and modified with Malaysia's situation so as to maximize the goals of promoting savings.

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