How Inflation and the Exchange Rate Affect the Real Value of Pension Plan Systems: The Case of Malaysia

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About Social Security Research Centre

The Social Security Research Centre (SSRC) was established in March 2011 at the Faculty of Economics and Administration (FEA), University of Malaya to initiate and carry out research, teaching and dissemination of evidence-based knowledge in the area of social security, including old age financial protection in order to enhance the understanding of this critical topic to promote economic development and social cohesion in Malaysia.

To support the research in social security in general and old-age financial protection in particular the Employees Provident Fund (EPF) of Malaysia has graciously provided an endowment fund to create the nation's first endowed Chair in Old Age Financial Protection (OAFPC) at University of Malaya. OAFPC has the over-riding objectives to help formulate policies to promote better social security and improve old age financial protection, and to help formulate policies to promote economic growth in an ageing society for consideration by the Government of Malaysia.

The interest in social security and old-age financial protection is ever growing in view of an ageing population. Malaysia is also subjected to rising life expectancy and falling fertility rates, the perceived inadequacy of current social security provisions, coupled with the added fear that simply more expenditure may not be conducive to the development and growth objectives of the society. This calls for innovative policy solutions that may be inspired by international experience based on an empirical grounding in national data and analysis.

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Abstract

This article explores how inflation and the exchange rate can affect the real value of any pension plan system in the long run. In our case, we focus on the specific pension plan system of the *Employees Provident Fund (EPF).* Nonetheless, we use a new model that is entitled "The EPF Real Value Box – EPFRV Box"*.* The EPFRV Box facilitates the graphical visualization of the inflation/exchange rate impact on the *Employees Provident Fund (EPF).* In essence, the EPFRV Box is applied to the *Employees Provident Fund (EPF) of* Malaysia to evaluate the impact of inflation and exchange rates on the Malaysian EPF real value from 1980 to 2030. Finally, the main objective is to apply the EPFRV Box to extend the significance of the impact of inflation and the exchange rate on any pension plan system (in this case EPF) beyond mere theory, using them as practical instruments to solve retirement and pensioner problems.

Keywords: Inflation, Pension Plan System, Malaysia, EPF, Econographicology

JEL Code: Y20

1.   Introduction

Old age was previously considered to be a demographic phenomenon for rich countries. However, currently, the aging population is a strong demographic trend not only in the developed world but also in developing nations. Most Latin American and Asian nations have experienced substantial increases in the portion of the population over age 60 since 2010 (Ahmad, et al. 1991; Grosh, 1990; ILO, 1989). Given this worldwide rise in the aged population, the pension systems in many countries have begun to face financial problems.

Around the globe in different countries, multiple retirement and pension systems have been used. Pension system models can be updated and have brought reforms to existing pension systems as well as the design of new ones in the light of these reforms. A number of organizations have advocated a multi-pillar approach to pension provisions, such as the World Bank, the ILO, the IMF and the Geneva Association, whose "Four Pillars Programme" was introduced some 25 years back (Ostaszewski, 2012).

The measurement of the actual benefits and costs of a pension system is vague due to the lack of historical information, the impossibility of forecasting even mid-term basic economic variables, and the complexity of rules that change from time to time as a result of legislation. Further, any comparison among nations or even over time for a given nation should be limited by a foundation of solvency of the pension plans. For instance, an estimation of the expansion in contributions or decrease in benefits is compulsory to adjust the plan monetarily or measure the additional and average cost of fiscal assets that are required to be adjusted in a framework. In this manner, factors, for example, inflation, exchange rate, salaries and loan fees, can change in light of irregular characteristics in the national pension framework, confounding further the elucidation of the computation of advantages and losses.

Researchers such as Kotlikoff (1988), and Sales, and Videgaray (1998) have devised methods that aim to measure pension systems under an aggregate restriction. Among these is the inter-generational accounting approach, which combines demographic and fiscal restrictions to measure flows of benefits and cost across generations. Second is actuarial evaluations of pension plans, which are the institutional way to measure pension systems financially. They usually make assumptions on the future evolution of salaries, interest rates, labor force participation and other variables and calculate the financial deficit of a plan at a given point in time. The main issue with both of the models is that

significant behavioral issues remain despite the practice of inter-generational accounting and traditional actuarial models. A main subject for developing countries is the way individuals may opportunistically adjust their contribution in the formal sector to develop their social security wealth.

In this paper, our focus is identifying the impact of inflation and the exchange rate on any pension system to evaluate existing pension systems in developing countries, in particular whether it benefits individuals with adjusted inflation. Therefore, this paper attempts to evaluate the impact of inflation and the exchange rate on any pension plan system value in the medium and long run. We are proposing a new methodology to visualize the relationship between inflation/exchange rate and the pension plan system final value. Therefore, the main inspiration to write this paper is based on analyzing how inflation and the exchange rate can affect any pension system performance and value in a certain period of time. It leads to better understanding about keeping inflation low and exchange rates strong to generate a high value in any pension system. In fact, this paper is interested in comparing graphically how high inflation and constant exchange rate depreciation impact on the pension system value performance. The main objective of this paper is to propose an alternative analytical tool that can enhance understanding of complex and dynamic relationships between the inflation/exchange rate and pension systems within the same graphical space at different periods of time. This paper is divided into three sections: (i) The calculation of the integral value of the pension system; (ii) the final result of the real value of the pension system; (iii) the plotting of the PRV-Box; (iv) observations about the inflation/exchange rate impact on the final value of any pension plan system. In this study, we evaluate the case of Malaysia EPF from 1980 to 2017; (v) policy recommendation.

The rest of the paper is organized as follows. Section 2 presents the evolution of the pension system in Malaysia. Section 3 gives a methodology of the pension real value box (PRV-Box). Section 4 presents the application of the EPF real value box to the Malaysian economy. Section 5 concludes the paper.

2.   Evolution of Pension System in Malaysia

The Malaysian Social Security Organization (SOCSO) was established in 1971 under the Ministry of Human Resources. This agency provides social security protection to all workers in the country. SOCSO administers and implements

two types of schemes; one is the Employment Injury Insurance Scheme, and the second is the Invalidity Pension Scheme. The Public Service Department (PSD) is responsible for pension policy and regulation. This department works under the umbrella of the Prime Minister's Department. The Employees Provident Fund (EPF) is an agency of the Malaysian Ministry of Finance established under the 1991 Employees Provident Fund Act. This is the national compulsory retirement savings scheme for private-division and non-pensionable public representatives in this country.

Additionally, the EPF provides a convenient system to employers to meet the constitutional rights of employees. In September 2016, the EPF has a sum of 14.72 million individuals. The aggregate number of active and participating individuals is 6.83 million. The aggregate number of active employers is 541,503. This retirement plan is completely supported and gives DC-sort advantages to its individuals. Government employees have their own, non-contributory DB annuity arrange. The Civil Service Pension is the present arrangements that depend on the Pensions Act 1980. In accordance with worldwide patterns, the retirement age has been raised a few times here in Malaysia. So, the changes have been made three times; first, the mandatory retirement age increased from 55 to 56 years in October 2001; from 56 to 58 in July 2008; and from 58 to 60 in January 2012, under the Minimum Retirement Age Act 2012 (Public Service Department, 2013; Social Security Administration, 2013). By and large, the Malaysia's retirement age went up by five years over a 12-year time frame. However, the increases in the retirement age were followed by various fruitful measures to expand benefits to labor.

In May 2007, the Malaysian Parliament altered the 1991 EPF Act to advance more retirement funds for private and non-pensionable government employees (Employees Provident Fund, 2007). Under the new Act, EPF individuals were urged to keep working beyond the age of 55. Additionally, the new amended Act needs all workers to make month-to-month contributions to the EPF as indicated by a two-tiered commitment rate. For those less than 55 years old, the statutory contribution rates were held at the past levels of 11% for laborers and 12% for businesses. For people whose ages are between 55 and 75, the relevant rates are 5.5% for laborers and 6% for bosses. In September 2012, further changes were made that responded to the changes in the demographic and social environment. The Malaysia government implemented the voluntary Private Retirement Scheme (PRS). This is a new DC retirement savings plan open to all Malaysian citizens aged 18 and above (Social Security Administration, 2012). Furthermore, a new law was implemented in October

2010 to expend the public pension coverage to part-time labor. The Ministry of Human Resources projected that around 12 million part-time workers would benefit from this new coverage (Tolos, Wang & Zhang, 2014).

3. An Introduction to The Pension Real Value Box (PRV-Box)

The EPF Real Value Box (EPFRV Box) is willing to evaluate the real value of any pension system. The calculation of the EPFRV Box is based on the calculation of two large sections: the total EPF domestic real value (EPF-DRV) and the total EPF international real value (EPF-IRV). The first section is the calculation of the EPF-DRV, which follows four basic steps: (i) find the inflation annual rate (I%); (ii) calculate the inflation growth rate between two years, where (ΔI) is equal to the first partial differentiation between the present inflation annual rate (∂I%$_t$) and the inflation annual rate from the last year (∂I%$_{t-1}$) divided by 100% (see Expression 1). In fact, we need to apply a constant that is equal to K= -1 because we can transform the negative results (or the decrement in the inflation rates) in positive results that can benefit the EPF real value domestically (EPF-DRV) and vice versa. Now, we can measure the discount domestic depreciation rate of EPF (ΔCPI$_t$) that is equal to multiplying the (ΔI) by the coefficient (-1) (see Expression 2); (iii) the next step is to calculate the total domestic depreciation value (CPI*) that is equal to multiplying (ΔCPI$_t$) by the present EPF amount of retirement (PA) according to expression 3. (iv) Finally, we can calculate the EPF domestic real value (EPF-DRV) that is equal to differentiating PA minus CPI*. Therefore, the EPF-DRV can show how much value is necessary for our EPF to cover any medical care and pay debt and any necessity item domestically after the EPF is obtained in the long run by pensioners (see Expression 4).

$$\Delta I = [\partial I\%_t / \partial I\%_{t-1}]/100\% \qquad (1)$$

$$\Delta CPI_t = \Delta I \cdot K \implies K = -1 \qquad (2)$$

$$CPI^* = \Delta CPI_t \times PA \qquad (3)$$

$$EPF\text{-}DRV = PA - CPI^* \qquad (4)$$

Moreover, the second section to calculate is the total EPF international real value (EPF-IRV). The EPF-IRV involves a series of steps: (i) find the average yearly exchange rate for each year (XR); (ii) the next step is to transform all the present EPF amounts of retirement (PA) from the local currency to American Dollars (US$) or any currency such as Japanese Yen (¥) or the Pound (£) according to our research interest (see Expression 5). (iii) The next step is

based on the calculation of the exchange rate growth rate (ΔXR); the ΔXR is equal to the first partial differentiation between the average exchange rate from the present year (∂XR_t) and the average exchange rate from the last year (∂XR_{t-1}) divided by 100% (see Equation 6). Hence, we need to apply a constant that is equal to K= -1 because we can transform the negative results (appreciation of the currency) into positive results that can benefit the EPF real value internationally and vice versa. Now, we can measure the discount international depreciation rate of EPF (ΔXR_t) that is equal to multiplying the (ΔXR^*) by the coefficient (-1) (see Expression 7); (iv) Finally, we proceed to calculate the total international depreciation value (XR^*) that is equal to multiplying the discount international depreciation rate of EPF (ΔXR_t) by the present EPF amount of retirement (PA). Subsequently, the XR^* is equal to multiplying again by the average yearly exchange rate for each year (XR) to obtain the EPF-IRV (see Expression 8). Finally, we need to convert the EPF-IRV from American Dollars (US\$) to the current currency using the same country. Additionally, we are using 15 periods of analysis (i = 1, 2, 3,…,15.). Each period of analysis is based on the exchange rate between two years. Therefore, we have 30 years (j = 1, 2, 3, …, 30) to build the EPFRV Box, respectively.

$$PV/XR \tag{5}$$

$$\Delta XR^* = [\partial XR_i / \partial XR_{i-1}]/100\% \tag{6}$$

$$XR_t = \Delta XR^* \cdot K \implies K = -1 \tag{7}$$

$$XR^* = \Delta XR_t \times PA \tag{8}$$

$$]]]]]]]] \quad EPF_{IRV} = XR^* \times XR \tag{9}$$

Now, it is possible to calculate the total depreciation of EPF (EPF-d). The EPF-d is equal to the total domestic depreciation value (CPI^*) plus the total international depreciation value (XR^*) using the local currency from the same country (see Expression 10).

$$EPF\text{-}d = CPI^* + XR^* \tag{10}$$

In the next step, we need to find the EPF present value (+EPF) following Expression 11.

$$+EPF = PA + (EPF\text{-}d) \tag{11}$$

Finally, we can find the real value of EPF (EPF$_{rv}$) in our simulator according to Expression 12.

$$EPF_{rv} = PA - (+EPF) \tag{12}$$

Basically, the Pension Real Value Box (PRV-Box) uses five variables, CPI*, EPF-DRF, XR*, EPF-IRV, and EPF-RV, from the year 1980 to 2030. In addition, we are running five different amounts in the PRV-Box: (RM 100,000), (RM 200,000) (RM 300,000) (RM 400,000) (RM 500,000). The main objective of the Pension Real Value Box (PRV-Box) is to find the optimum inflation rate and exchange rate to avoid the EPF losing its real value in the long run. Basically, in figure 1, we use the Mega-Dynamic Disks Multivariable Random Coordinate Space in Vertical Position by Ruiz Estrada 2014. The Mega-Dynamic Disks Multivariable Random Coordinate Space in Vertical Position is the basic graphical framework that we are using to build the Pension Real Value Box (PRV-Box). The Mega-Dynamic Disks Multivariable Random Coordinate Space in Vertical Position captures n-dimensions in the same graphical space at the same time. Therefore, this new special coordinate space creates the possibility to visualize a large number of endogenous and exogenous variables that are interconnected and moving into different graphical spaces with different time frameworks without any restrictions. Now, it is possible to observe how an infinite number of endogenous variables and exogenous variables are working together simultaneously. At the same time, we can visualize how all these variables interact together through the visualization of an asymmetric spiral-shaped figure with n-faces that keep in constant movement in real time. This asymmetric spiral-shaped figure with n-faces can show an expansion or contraction that is based on different changes among all variables at different graphical spaces with different time frameworks. In our case, we are looking to find the final EPF real value at the same graphical space and time. Later, we proceed to transfer the EPF real value critical point (EPF-CP) into a 2-Dimensional Cartesian coordinate to show the EPF real value critical point (EPF-CP) is equal to 0. At the same time, the EPF real value critical point (EPF-CP) starts to get negative values. From a mathematical perspective, the EPF real value critical point (EPF-CP) is equivalent to a second derivative based on the differentiation in the EPF present value $\partial^2 + EPF(t)$ by the EPF past value past year $\partial^2 + EPF(t-1)$.

$$EPF\text{-}CP = \partial^2 + EPF(t)/\partial^2 + EPF = 0 \tag{13}$$

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The main reason to find the EPF real value critical point (EPF-RV) is to evaluate the optimum inflation rate and exchange rate that can alert us to implement fiscal and monetary policies to reduce the damage of the EPF real value in the long run.

Figure 1: The Pension Real Value Box (PRV-Box)
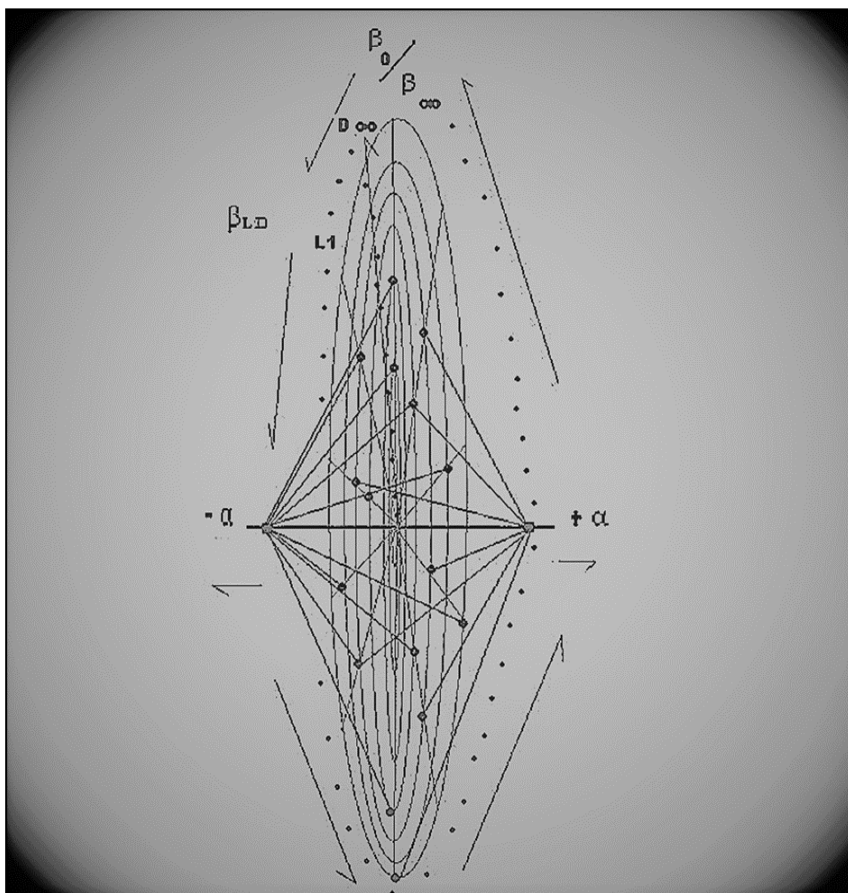

Source: Ruiz Estrada (2014)

4. How Inflation and the Exchange Rate Can Affect the Malaysian EPF Real Value (EPF-RV):

Initially, we select the Malaysia *Employees Provident Fund (EPF) to apply the* EPF Real Value Box (EPFRV Box)*. First, we consider taking the* inflation annual rate*s (*I%*) of Malaysia from 1980 to 2016. Later, we forecast the* inflation annual

rate *(*I%) *from the year 2017 to the year 2030. Additionally, we use five possible scenarios with different amounts of funds to simulate from low to high funds:* (RM 100,000), (RM 200,000) (RM 300,000) (RM 400,000) (RM 500,000). We can observe that the inflation rates of Malaysia keep a low and acceptable range from the year 1980 to the year 2015. But, the inflation rate starts to move up from the year 2016 until the current day according to column 3, represented by (I%) in Tables 1, 2, 3, 4, and 5. The high inflation annual rates from the year 2016 to the year 2030 can easily cause the EPF domestic real value to fall considerably. The exchange rate, a critical variable in the calculation of the EPF international real value, shows that from the year 2016, Malaysia experiences a high devaluation of the Ringgit Malaysia (RM) compared to the past 35 years (1980-2014) according to column 10 (XR) in tables 1, 2, 3, 4, and 5 (see appendix 1). The large depreciation of the Ringgit Malaysia generates a huge impact on the EPF-IRV in the long run that can directly affect the EPF real value (EPF-RV) performance constantly.

Therefore, the EPF critical point shows the optimal maximum inflation rate and optimal; maximum exchange rate to avoid the considerable drop in EPF real value in negative numbers (poor value). In the case of the Malaysian EPF real value, to keep an acceptable real value, the optimal inflation rate needs to be less than 7% and the exchange rate equal to US$1 = RM 7 (Ringgit Malaysia). If the exchange rate of Malaysia passes more than US$1 = RM 7, the EPF real value can drop considerably until bringing the EPF real price to negative values (poor value) in the long run for Malaysians (see Table 1, 2, 3, 4, 5 and Figure 1). The EPF real value maintains constant expansion and good performance from the year 1980 to the year 2004 according to figure 3, 4, 5, 6. From the year 2005 until the current day, the EPF real value drops dramatically. According to the EPF Real Value Box (EPFRV Box), there is a high possibility that the EPF critical point is going to arrive in the year 2022 based on five simulations performed with different fund amounts: RM 100,000), (RM 200,000) (RM 300,000) (RM 400,000) (RM 500,000) according to Tables 1,2,3,4, and 5. The five simulations show that a common result is that the EPF critical point is in the year 2022 (see Figures 3, 4, 5, 6). This means that the EPF real value is equal to zero according to our calculations. Therefore, from the year 2023 to the year 2030, the EPF real value is dropping in negative values. These negative values represent the lowest value to pay high medical care costs, large debts in the long run, or buy goods and services with high prices domestically after people receive the *Employees Provident Fund (*EPF) in the long run.

Finally, to keep healthy EPF real values in Malaysia, it is essentially a question of keeping or reducing inflation rates at a level of 7% because a large increment in the inflation rates of Malaysia can directly affect the performance of the EPF domestic real price and the EPF real value. It is necessary to keep healthy and sustainable inflation rates under the application of fiscal policy based on an equilibrate taxation (focus on the reduction of GST – indirect tax – and strict control on the direct tax) together with better control in government spending items (increase investment spending – infrastructure and development – more than functional spending –salaries and maintenance) and better control of domestic prices (top prices policy). On the other hand, regarding the same situation with respect to exchanges rates, Malaysia needs to maintain better control of its monetary policy and balance of payments to generate favorable conditions so that the Malaysian Ringgit (RM) appreciates against the US$ and other strong international currencies such as the Japanese Yen, Pound, Euro, and Yuan. Hence, the main objective is to keep an equilibrate EPF domestic real value (low inflation) and EPF international real value (domestic currency appreciation) to generate favorable conditions, generating strong and sustainable socio-economic development for Malaysians through a strong EPF real value in the long run.

Figure 2: The Pension Real Value Box (PRV-Box) of Malaysia EPF from 1980 to 2030
Simulation under
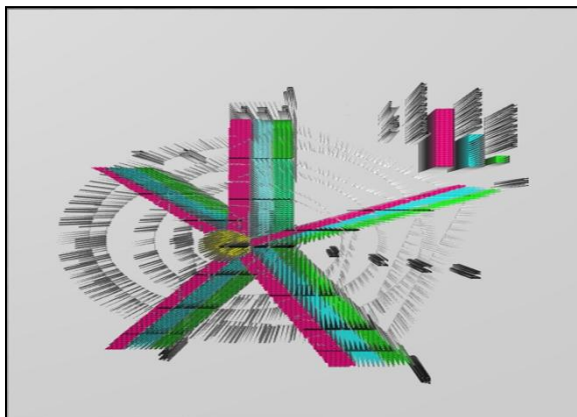
Source: From tables 1, 2, 3, 4, and 5.

Figure 3: Critical EPF Real Value under RM 100,000 (1980-2017)
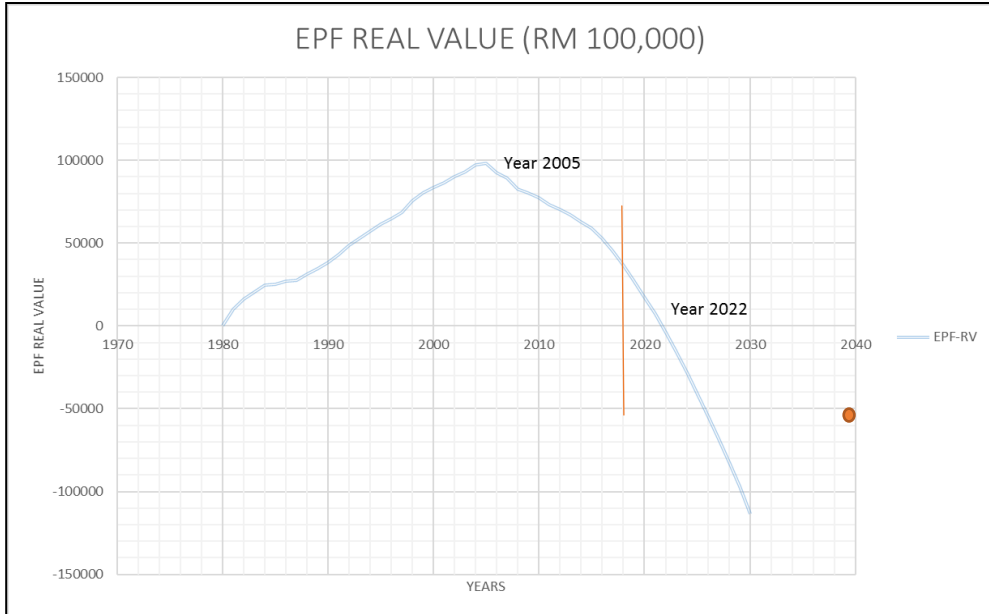
Source: Figure 1 and Table 1

Figure 4: Critical EPF Real Value under RM 200,000 (1980-2017)
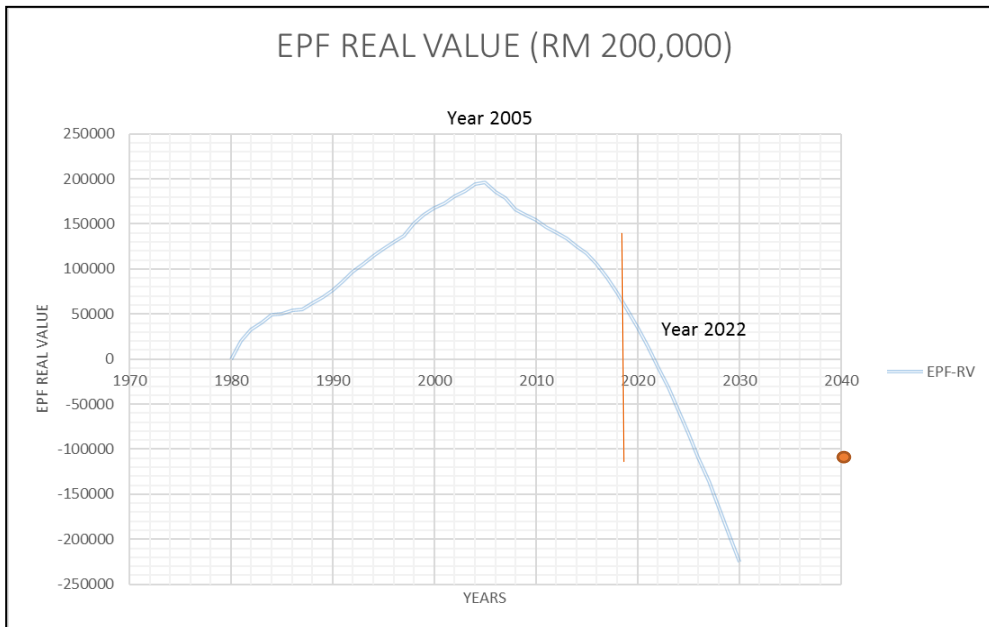
Source: Figure 1 and Table 2

Figure 5: Critical EPF Real Value under RM 300,000 (1980-2017)
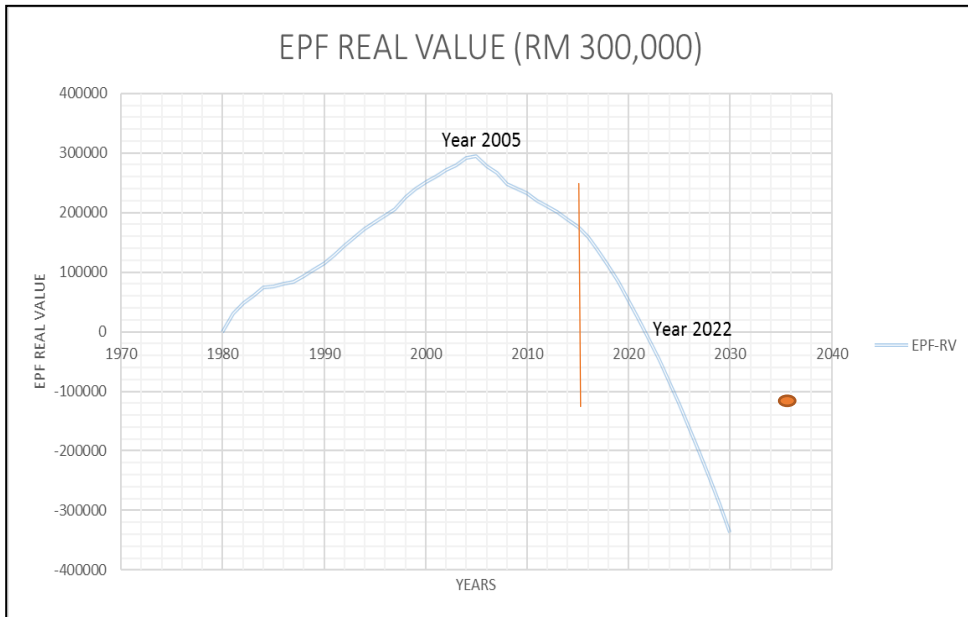
Source: Figure 1 and Table 3

Figure 6: Critical EPF Real Value under RM 400,000 (1980-2017)
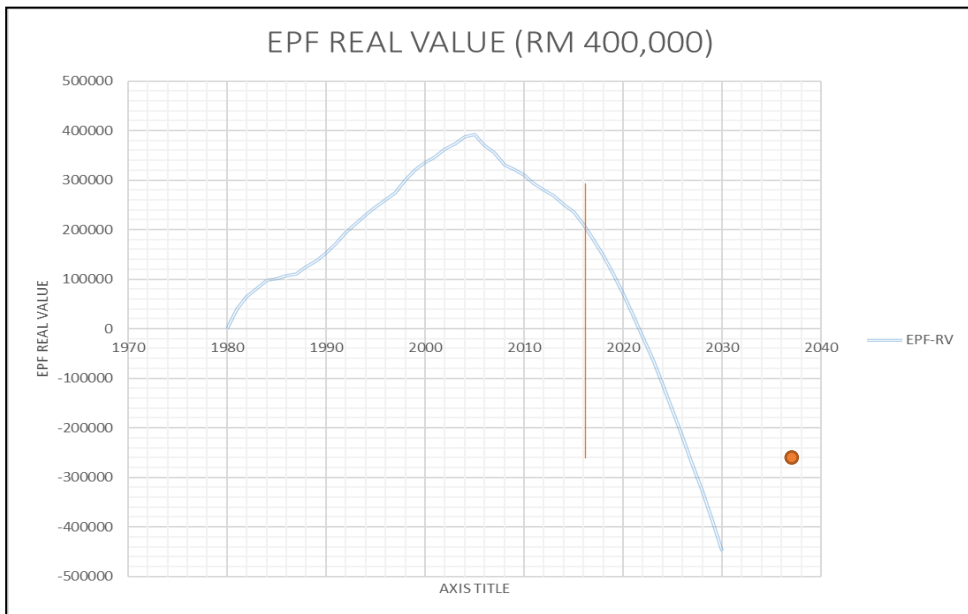
Source: Figure 1 and Table 4

Figure 7: Critical EPF Real Value under RM 500,000 (1980-2017)
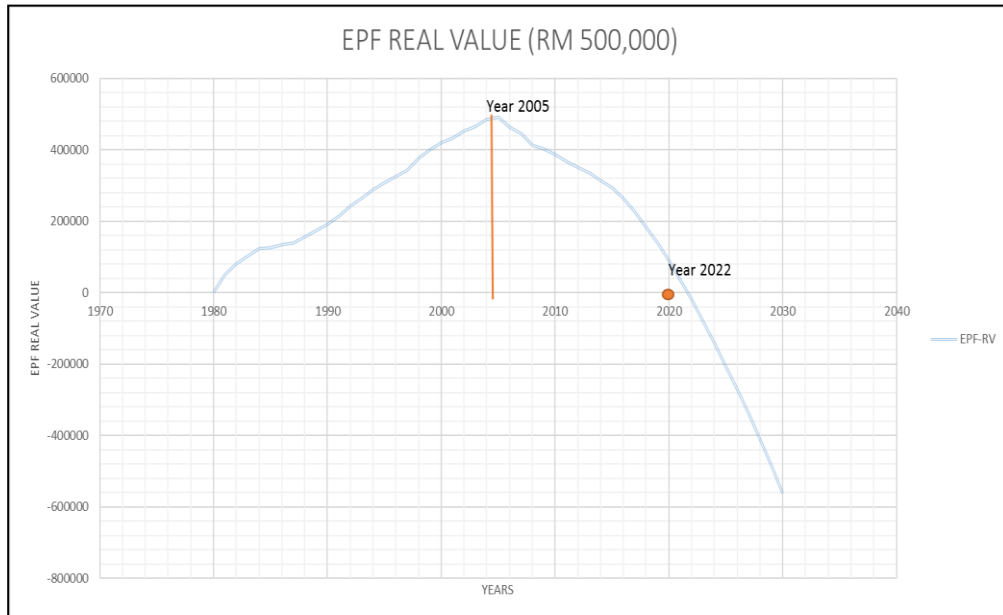
Source: Figure 1 and Table 5

5. Conclusion

We can confirm that inflation and the exchange rate strongly affects any pension system in the long run. The major contribution of this research paper is the innovative way that pension systems are analyzed, especially in the case of the *Employees Provident Fund (*EPF). This research uses an alternative multidimensional graphical approach (The Mega-Dynamic Disks Multivariable Random Coordinate Space in Vertical Position) and a large database from the World Bank (WB) to build the Pension Real Value Box (PRV-Box). This new analytical tool makes it possible to evaluate a large number of variables such as CPI^{*}, EPF-DRV, XR^{*}, EPF-IRV, and EPF-RV together in the same graphical space and time framework. The Pension Real Value Box (PRV-Box) was applied in the case of the Malaysia *Employees Provident Fund (*EPF) from the year 1980 to the year 2030. This research concludes that the EPF critical point is located in the year 2022 (see Figure 3, 4, 5, 6, and 7) in our five simulations with different amounts of funds (RM 100,000), (RM 200,000) (RM 300,000) (RM 400,000) (RM 500,000) according to Table 1, 2, 3, 4, and 5. If the Malaysian inflation rate is higher than 7% and the exchange rate is more than US$ 1 by RM 7, the EPF real value of Malaysia can collapse with negative values (an extremely low value) such that the EPF real value is so low that it cannot cover

basic medical care costs or large debts in the long run, nor can it buy goods and services to satisfy the basic necessities of Malaysian pensioners in the long run. In figure 1, we can observe how a large number of variables affect directly or indirectly the Malaysian EPF value in the last 30 years with dramatic changes in the same graphical space and time framework. Therefore, we plot different points around the surface to fit and interconnect these variables with straight lines. At a glance, each surface looks logical, lacking interconnectivity among these variables, which is based on this research. This paper captures multidimensional graphical modelling based on the mega-dynamic disks multivariable random coordinate space in horizontal position that is proposed. We clearly observe the relationship that exists between inflation/exchange rate and its effects on any pension system in a logical and systematic order. Hence, we demonstrate how a non-linear spiral-shape graphical form representation construction starts to be plotted from the top to the bottom of the mega-dynamic disks multivariable random coordinate space in a horizontal position. The Pension Real Value Box (PRV-Box) value surface from a multidimensional perspective is displayed and follows consistent behavior to prove that there exists a strong relationship between inflation/exchange rate and the EPF real value. We conclude that any pension system needs to include inflation and the exchange rate to evaluate its future and real value for pensioner's welfare without any restriction or limitations in the analysis.

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APPENDIX 1

Table 1: Malaysian EPF Real Value with an Amount of RM 100,000 (1980-2030)

							EPF COMPETITIVINESS (Value = RM100,000)												
PER	Year	I%	ΔI	C0f.-1	ΔCPI	PA	CPI*	EPF-DRV	XR	EPFus$	ΔXR	Cof.-1	ΔXR*	PA	XR*	EPF-IRV	EPF-d	+EPF	EPF-RV
1	1980	7	0.00	-1.00	0.00	100,000	0	100000	2.18	45937	0.00	-1.00	0.00	100,000	0	0	0	100,000	0
2	1981	10	0.09	-1.00	-0.09	100,000	-8700	91300	2.30	43400	0.01	-1.00	-0.01	100,000	-1,304	-3,005	-10004	89,996	10,004
3	1982	6	0.05	-1.00	-0.05	100,000	-4819	95181	2.34	42819	0.01	-1.00	-0.01	100,000	-1,335	-3,119	-6154	83,842	16,158
4	1983	4	0.03	-1.00	-0.03	100,000	-2704	97296	2.32	43080	0.01	-1.00	-0.01	100,000	-1,321	-3,067	-4025	79,816	20,184
5	1984	4	0.03	-1.00	-0.03	100,000	-3000	97000	2.34	42669	0.01	-1.00	-0.01	100,000	-1,344	-3,149	-4344	75,472	24,528
6	1985	0.3	-0.01	-1.00	0.01	100,000	700	100700	2.48	40273	0.01	-1.00	-0.01	100,000	-1,483	-3,682	-783	74,689	25,311
7	1986	1	0.00	-1.00	0.00	100,000	0	100000	2.58	38738	0.02	-1.00	-0.02	100,000	-1,581	-4,082	-1581	73,108	26,892
8	1987	0.3	-0.01	-1.00	0.01	100,000	710	100710	2.52	39688	0.02	-1.00	-0.02	100,000	-1,520	-3,829	-810	72,298	27,702
9	1988	3	0.02	-1.00	-0.02	100,000	-1810	98190	2.62	38186	0.02	-1.00	-0.02	100,000	-1,619	-4,239	-3429	68,870	31,130
10	1989	3	0.02	-1.00	-0.02	100,000	-1620	98380	2.71	36916	0.02	-1.00	-0.02	100,000	-1,709	-4,629	-3329	65,541	34,459
11	1990	3	0.02	-1.00	-0.02	100,000	-2000	98000	2.70	36970	0.02	-1.00	-0.02	100,000	-1,705	-4,611	-3705	61,836	38,164
12	1991	4	0.03	-1.00	-0.03	100,000	-3000	97000	2.75	36363	0.02	-1.00	-0.02	100,000	-1,750	-4,813	-4750	57,086	42,914
13	1992	5	0.04	-1.00	-0.04	100,000	-4000	96000	2.55	39256	0.02	-1.00	-0.02	100,000	-1,547	-3,942	-5547	51,538	48,462
14	1993	4	0.03	-1.00	-0.03	100,000	-2720	97280	2.57	38849	0.02	-1.00	-0.02	100,000	-1,574	-4,052	-4294	47,244	52,756
15	1994	4	0.03	-1.00	-0.03	100,000	-3000	97000	2.62	38106	0.02	-1.00	-0.02	100,000	-1,624	-4,262	-4624	42,620	57,380
16	1995	3	0.02	-1.00	-0.02	100,000	-2490	97510	2.50	39930	0.02	-1.00	-0.02	100,000	-1,504	-3,768	-3994	38,626	61,374
17	1996	3	0.02	-1.00	-0.02	100,000	-2000	98000	2.52	39747	0.02	-1.00	-0.02	100,000	-1,516	-3,814	-3516	35,110	64,890
18	1997	3	0.02	-1.00	-0.02	100,000	-1740	98260	2.81	35547	0.02	-1.00	-0.02	100,000	-1,813	-5,101	-3553	68,444	68,444
19	1998	5	0.04	-1.00	-0.04	100,000	-4000	96000	3.92	25482	0.03	-1.00	-0.03	100,000	-2,924	-11,476	-6924	24,632	75,368
20	1999	3	0.02	-1.00	-0.02	100,000	-2000	98000	3.80	26316	0.03	-1.00	-0.03	100,000	-2,800	-10,640	-4800	19,832	80,168
21	2000	2	0.01	-1.00	-0.01	100,000	-810	99190	3.80	26316	0.03	-1.00	-0.03	100,000	-2,800	-10,640	-3610	16,222	83,778
22	2001	1	0.00	-1.00	0.00	100,000	0	100000	3.80	26316	0.03	-1.00	-0.03	100,000	-2,800	-10,640	-2800	13,422	86,578
23	2002	2	0.01	-1.00	-0.01	100,000	-1000	99000	3.80	26316	0.03	-1.00	-0.03	100,000	-2,800	-10,640	-3800	9,622	90,378
24	2003	1	0.00	-1.00	0.00	100,000	0	100000	3.80	26316	0.03	-1.00	-0.03	100,000	-2,800	-10,640	-2800	6,822	93,178
25	2004	2	0.01	-1.00	-0.01	100,000	-1000	99000	3.80	26316	0.03	-1.00	-0.03	100,000	-2,800	-10,640	-3800	3,022	96,978
26	2005	3	0.02	-1.00	-0.02	100,000	-2000	98000	3.79	26405	0.03	-1.00	-0.03	100,000	-2,787	-10,555	-4787	-1,765	98,235
27	2006	4	0.03	-1.00	-0.03	100,000	-3000	97000	3.67	27261	0.03	-1.00	-0.03	100,000	-2,668	-9,787	-5668	-7,433	92,567
28	2007	2	0.01	-1.00	-0.01	100,000	-1000	99000	3.44	29090	0.02	-1.00	-0.02	100,000	-2,438	-8,379	-3438	-10,871	89,129
29	2008	5	0.04	-1.00	-0.04	100,000	-4000	96000	3.34	29978	0.02	-1.00	-0.02	100,000	-2,336	-7,792	-6336	-17,207	82,793
30	2009	1	0.00	-1.00	0.00	100,000	0	100000	3.52	28373	0.03	-1.00	-0.03	100,000	-2,525	-8,898	-2525	-19,731	80,269
31	2010	2	0.01	-1.00	-0.01	100,000	-660	99340	3.22	31045	0.02	-1.00	-0.02	100,000	-2,221	-7,154	-2881	-22,612	77,388
32	2011	3	0.02	-1.00	-0.02	100,000	-2000	98000	3.06	32680	0.02	-1.00	-0.02	100,000	-2,060	-6,304	-4060	-26,672	73,328
33	2012	2	0.01	-1.00	-0.01	100,000	-1000	99000	3.09	32375	0.02	-1.00	-0.02	100,000	-2,089	-6,452	-3089	-29,761	70,239
34	2013	2	0.01	-1.00	-0.01	100,000	-1000	99000	3.15	31737	0.02	-1.00	-0.02	100,000	-2,151	-6,777	-3151	-32,912	67,088
35	2014	3	0.02	-1.00	-0.02	100,000	-2000	98000	3.27	30554	0.02	-1.00	-0.02	100,000	-2,273	-7,439	-4273	-37,185	62,815
36	2015	2	0.01	-1.00	-0.01	100,000	-1000	99000	3.91	25605	0.03	-1.00	-0.03	100,000	-2,906	-11,347	-3906	-41,090	58,910
37	2016	4	0.03	-1.00	-0.03	100,000	-3000	97000	4.00	25000	0.03	-1.00	-0.03	100,000	-3,000	-12,000	-6000	-47,090	52,910
38	2017	5	0.04	-1.00	-0.04	100,000	-4000	96000	4.60	21739	0.04	-1.00	-0.04	100,000	-3,600	-16,560	-7600	-54,690	45,310
39	2018	6	0.05	-1.00	-0.05	100,000	-4500	95500	5.00	20000	0.04	-1.00	-0.04	100,000	-4,000	-20,000	-8500	-63,190	36,810
40	2019	6	0.05	-1.00	-0.05	100,000	-4900	95100	5.25	19048	0.04	-1.00	-0.04	100,000	-4,250	-22,313	-9150	-72,340	27,660
41	2020	6	0.05	-1.00	-0.05	100,000	-5100	94900	6.00	16667	0.05	-1.00	-0.05	100,000	-5,000	-30,000	-10100	-82,440	17,560
42	2021	6	0.05	-1.00	-0.05	100,000	-5350	94650	6.20	16129	0.05	-1.00	-0.05	100,000	-5,200	-32,240	-10550	-92,990	7,010
43	2022	6	0.05	-1.00	-0.05	100,000	-5450	94550	6.50	15385	0.06	-1.00	-0.06	100,000	-5,500	-35,750	-10950	-103,940	-3,940
44	2023	7	0.06	-1.00	-0.06	100,000	-5900	94100	7.00	14286	0.06	-1.00	-0.06	100,000	-6,000	-42,000	-11900	-115,840	-15,840
45	2024	7	0.06	-1.00	-0.06	100,000	-6000	94000	7.35	13605	0.06	-1.00	-0.06	100,000	-6,350	-46,673	-12350	-128,190	-28,190
46	2025	7	0.06	-1.00	-0.06	100,000	-6150	93850	7.80	12821	0.07	-1.00	-0.07	100,000	-6,800	-53,040	-12950	-141,140	-41,140
47	2026	7	0.06	-1.00	-0.06	100,000	-6290	93710	8.00	12500	0.07	-1.00	-0.07	100,000	-7,000	-56,000	-13290	-154,430	-54,430
48	2027	7	0.06	-1.00	-0.06	100,000	-6390	93610	8.15	12270	0.07	-1.00	-0.07	100,000	-7,150	-58,273	-13540	-167,970	-67,970
49	2028	8	0.07	-1.00	-0.07	100,000	-6850	93150	8.40	11905	0.07	-1.00	-0.07	100,000	-7,400	-62,160	-14250	-182,220	-82,220
50	2029	8	0.07	-1.00	-0.07	100,000	-6960	93040	8.67	11534	0.08	-1.00	-0.08	100,000	-7,670	-66,499	-14630	-196,850	-96,850
51	2030	8	0.08	-1.00	-0.08	100,000	-8000	92000	9.50	10526	0.09	-1.00	-0.09	100,000	-8,500	-80,750	-16500	-213,350	-113,350

Source: World Bank (2017)

Table 2: Malaysian EPF Real Value with an Amount of RM 200,000 (1980-2030)

							EPF REAL VALUE (Value = RM200,000)										
PER	Year	I%	ΔI	C0f.-1	ΔCPI	PA	CPI*	EPF-DRV	XR	EPFus$	ΔXR	Cof.-1	ΔXR*	PA	XR*	EPF-IRV	EPF-d	+EPF	EPF-RV
1	1980	7	0.00	-1.00	0.00	200,000	0	200000	2.18	91874	0.00	-1.00	0.00	200,000	0	200,000	0	200,000	0
2	1981	10	0.09	-1.00	-0.09	200,000	-17400	182600	2.30	86801	0.00	-1.00	-0.01	200,000	-2,608	-6,010	-20008	179,992	20,008
3	1982	6	0.05	-1.00	-0.05	200,000	-9638	190362	2.34	85639	0.01	-1.00	-0.01	200,000	-2,671	-6,237	-12309	167,683	32,317
4	1983	4	0.03	-1.00	-0.03	200,000	-5408	194592	2.32	86160	0.01	-1.00	-0.01	200,000	-2,642	-6,134	-8051	159,632	40,368
5	1984	4	0.03	-1.00	-0.03	200,000	-6000	194000	2.34	85337	0.01	-1.00	-0.01	200,000	-2,687	-6,298	-8687	150,945	49,055
6	1985	0.3	-0.01	-1.00	0.01	200,000	1400	201400	2.48	80546	0.01	-1.00	-0.01	200,000	-2,966	-7,365	-1566	149,379	50,621
7	1986	1	0.00	-1.00	0.00	200,000	0	200000	2.58	77476	0.02	-1.00	-0.02	200,000	-3,163	-8,165	-3163	146,216	53,784
8	1987	0.3	-0.01	-1.00	0.01	200,000	1420	201420	2.52	79376	0.02	-1.00	-0.02	200,000	-3,039	-7,658	-1619	144,597	55,403
9	1988	3	0.02	-1.00	-0.02	200,000	-3620	196380	2.62	76371	0.02	-1.00	-0.02	200,000	-3,238	-8,478	-6858	137,739	62,261
10	1989	3	0.02	-1.00	-0.02	200,000	-3240	196760	2.71	73832	0.02	-1.00	-0.02	200,000	-3,418	-9,258	-6658	131,081	68,919
11	1990	3	0.02	-1.00	-0.02	200,000	-4000	196000	2.70	73941	0.02	-1.00	-0.02	200,000	-3,410	-9,223	-7410	123,672	76,328
12	1991	4	0.03	-1.00	-0.03	200,000	-6000	194000	2.75	72726	0.02	-1.00	-0.02	200,000	-3,500	-9,626	-9500	114,172	85,828
13	1992	5	0.04	-1.00	-0.04	200,000	-8000	192000	2.55	78512	0.02	-1.00	-0.02	200,000	-3,095	-7,884	-11095	103,077	96,923
14	1993	4	0.03	-1.00	-0.03	200,000	-5440	194560	2.57	77697	0.02	-1.00	-0.02	200,000	-3,148	-8,104	-8588	94,489	105,511
15	1994	4	0.03	-1.00	-0.03	200,000	-6000	194000	2.62	76212	0.02	-1.00	-0.02	200,000	-3,249	-8,525	-9249	85,240	114,760
16	1995	3	0.02	-1.00	-0.02	200,000	-4980	195020	2.50	79859	0.02	-1.00	-0.02	200,000	-3,009	-7,535	-7989	77,251	122,749
17	1996	3	0.02	-1.00	-0.02	200,000	-4000	196000	2.52	79493	0.02	-1.00	-0.02	200,000	-3,032	-7,628	-7032	70,219	129,781
18	1997	3	0.02	-1.00	-0.02	200,000	-3480	196520	2.81	71094	0.02	-1.00	-0.02	200,000	-3,626	-10,202	-7106	63,113	136,887
19	1998	5	0.04	-1.00	-0.04	200,000	-8000	192000	3.92	50964	0.03	-1.00	-0.03	200,000	-5,849	-22,953	-13849	49,264	150,736
20	1999	3	0.02	-1.00	-0.02	200,000	-4000	196000	3.80	52632	0.03	-1.00	-0.03	200,000	-5,600	-21,280	-9600	39,664	160,336
21	2000	2	0.01	-1.00	-0.01	200,000	-1620	198380	3.80	52632	0.03	-1.00	-0.03	200,000	-5,600	-21,280	-7220	32,444	167,556
22	2001	1	0.00	-1.00	0.00	200,000	0	200000	3.80	52632	0.03	-1.00	-0.03	200,000	-5,600	-21,280	-5600	26,844	173,156
23	2002	2	0.01	-1.00	-0.01	200,000	-2000	198000	3.80	52632	0.03	-1.00	-0.03	200,000	-5,600	-21,280	-7600	19,244	180,756
24	2003	1	0.00	-1.00	0.00	200,000	0	200000	3.80	52632	0.03	-1.00	-0.03	200,000	-5,600	-21,280	-5600	13,644	186,356
25	2004	2	0.01	-1.00	-0.01	200,000	-2000	198000	3.80	52632	0.03	-1.00	-0.03	200,000	-5,600	-21,280	-7600	6,044	193,956
26	2005	3	0.02	-1.00	-0.02	200,000	-4000	196000	3.79	52811	0.03	-1.00	-0.03	200,000	-5,574	-21,110	-9574	-3,530	196,470
27	2006	4	0.03	-1.00	-0.03	200,000	-6000	194000	3.67	54523	0.03	-1.00	-0.03	200,000	-5,336	-19,575	-11336	-14,866	185,134
28	2007	2	0.01	-1.00	-0.01	200,000	-2000	198000	3.44	58181	0.02	-1.00	-0.02	200,000	-4,875	-16,759	-6875	-21,741	178,259
29	2008	5	0.04	-1.00	-0.04	200,000	-8000	192000	3.34	59955	0.02	-1.00	-0.02	200,000	-4,672	-15,584	-12672	-34,413	165,587
30	2009	1	0.00	-1.00	0.00	200,000	0	200000	3.52	56746	0.03	-1.00	-0.03	200,000	-5,049	-17,795	-5049	-39,462	160,538
31	2010	2	0.01	-1.00	-0.01	200,000	-1320	198680	3.22	62091	0.02	-1.00	-0.02	200,000	-4,442	-14,309	-5762	-45,224	154,776
32	2011	3	0.02	-1.00	-0.02	200,000	-4000	196000	3.06	65359	0.02	-1.00	-0.02	200,000	-4,120	-12,607	-8120	-53,344	146,656
33	2012	2	0.01	-1.00	-0.01	200,000	-2000	198000	3.09	64750	0.02	-1.00	-0.02	200,000	-4,178	-12,904	-6178	-59,522	140,478
34	2013	2	0.01	-1.00	-0.01	200,000	-2000	198000	3.15	63474	0.02	-1.00	-0.02	200,000	-4,302	-13,555	-6302	-65,824	134,176
35	2014	3	0.02	-1.00	-0.02	200,000	-4000	196000	3.27	61109	0.02	-1.00	-0.02	200,000	-4,546	-14,878	-8546	-74,369	125,631
36	2015	2	0.01	-1.00	-0.01	200,000	-2000	198000	3.91	51210	0.03	-1.00	-0.03	200,000	-5,811	-22,695	-7811	-82,180	117,820
37	2016	4	0.03	-1.00	-0.03	200,000	-6000	194000	4.00	50000	0.03	-1.00	-0.03	200,000	-6,000	-24,000	-12000	-94,180	105,820
38	2017	5	0.04	-1.00	-0.04	200,000	-8000	192000	4.60	43478	0.04	-1.00	-0.04	200,000	-7,200	-33,120	-15200	-109,380	90,620
39	2018	6	0.05	-1.00	-0.05	200,000	-9000	191000	5.00	40000	0.04	-1.00	-0.04	200,000	-8,000	-40,000	-17000	-126,380	73,620
40	2019	6	0.05	-1.00	-0.05	200,000	-9800	190200	5.25	38095	0.04	-1.00	-0.04	200,000	-8,500	-44,625	-18300	-144,680	55,320
41	2020	6	0.05	-1.00	-0.05	200,000	-10200	189800	6.00	33333	0.05	-1.00	-0.05	200,000	-10,000	-60,000	-20200	-164,880	35,120
42	2021	6	0.05	-1.00	-0.05	200,000	-10700	189300	6.20	32258	0.05	-1.00	-0.05	200,000	-10,400	-64,480	-21100	-185,980	14,020
43	2022	6	0.05	-1.00	-0.05	200,000	-10900	189100	6.50	30769	0.06	-1.00	-0.06	200,000	-11,000	-71,500	-21900	-207,880	-7,880
44	2023	7	0.06	-1.00	-0.06	200,000	-11800	188200	7.00	28571	0.06	-1.00	-0.06	200,000	-12,000	-84,000	-23800	-231,680	-31,680
45	2024	7	0.06	-1.00	-0.06	200,000	-12000	188000	7.35	27211	0.06	-1.00	-0.06	200,000	-12,700	-93,345	-24700	-256,380	-56,380
46	2025	7	0.06	-1.00	-0.06	200,000	-12300	187700	7.80	25641	0.07	-1.00	-0.07	200,000	-13,600	-106,080	-25900	-282,280	-82,280
47	2026	7	0.06	-1.00	-0.06	200,000	-12580	187420	8.00	25000	0.07	-1.00	-0.07	200,000	-14,000	-112,000	-26580	-308,860	-108,860
48	2027	7	0.06	-1.00	-0.06	200,000	-12780	187220	8.15	24540	0.07	-1.00	-0.07	200,000	-14,300	-116,545	-27080	-335,940	-135,940
49	2028	8	0.07	-1.00	-0.07	200,000	-13700	186300	8.40	23810	0.07	-1.00	-0.07	200,000	-14,800	-124,320	-28500	-364,440	-164,440
50	2029	8	0.07	-1.00	-0.07	200,000	-13920	186080	8.67	23068	0.08	-1.00	-0.08	200,000	-15,340	-132,998	-29260	-393,700	-193,700
51	2030	8	0.07	-1.00	-0.07	200,000	-14000	186000	9.50	21053	0.09	-1.00	-0.09	200,000	-17,000	-161,500	-31000	-424,700	-224,700

Source: World Bank (2017)

Table 3: Malaysian EPF Real Value with an Amount of RM 300,000 (1980-2030)

PER	Year	I%	ΔI	COf.-1	ΔCPI	PA	CPI*	EPF-DRV	XR	EPFus$	ΔXR	Cof.-1	ΔXR*	PA	XR*	EPF-IRV	EPF-d	+EPF	EPF-RV
							EPF REAL VALUE (Value = RM300,000)												
1	1980	7	0.00	-1.00	0.00	300,000	0	300000	2.18	137812	0.00	-1.00	0.00	300,000	0	0	0	300,000	0
2	1981	10	0.09	-1.00	-0.09	300,000	-26100	273900	2.30	130201	0.01	-1.00	-0.01	300,000	-3,912	-9,015	-30012	269,988	30,012
3	1982	6	0.05	-1.00	-0.05	300,000	-14457	285543	2.34	128458	0.01	-1.00	-0.01	300,000	-4,006	-9,356	-18463	251,525	48,475
4	1983	4	0.03	-1.00	-0.03	300,000	-8113	291887	2.32	129241	0.01	-1.00	-0.01	300,000	-3,964	-9,201	-12076	239,448	60,552
5	1984	4	0.03	-1.00	-0.03	300,000	-9000	291000	2.34	128006	0.01	-1.00	-0.01	300,000	-4,031	-9,447	-13031	226,417	73,583
6	1985	0.3	-0.01	-1.00	0.01	300,000	2100	302100	2.48	120820	0.01	-1.00	-0.01	300,000	-4,449	-11,047	-2349	224,068	75,932
7	1986	1	0.00	-1.00	0.00	300,000	0	300000	2.58	116214	0.02	-1.00	-0.02	300,000	-4,744	-12,247	-4744	219,324	80,676
8	1987	0.3	-0.01	-1.00	0.01	300,000	2130	302130	2.52	119065	0.02	-1.00	-0.02	300,000	-4,559	-11,487	-2429	216,895	83,105
9	1988	3	0.02	-1.00	-0.02	300,000	-5430	294570	2.62	114557	0.02	-1.00	-0.02	300,000	-4,856	-12,718	-10286	206,609	93,391
10	1989	3	0.02	-1.00	-0.02	300,000	-4860	295140	2.71	110748	0.02	-1.00	-0.02	300,000	-5,127	-13,887	-9987	196,622	103,378
11	1990	3	0.02	-1.00	-0.02	300,000	-6000	294000	2.70	110911	0.02	-1.00	-0.02	300,000	-5,115	-13,834	-11115	185,507	114,493
12	1991	4	0.03	-1.00	-0.03	300,000	-9000	291000	2.75	109088	0.02	-1.00	-0.02	300,000	-5,250	-14,438	-14250	171,257	128,743
13	1992	5	0.04	-1.00	-0.04	300,000	-12000	288000	2.55	117768	0.02	-1.00	-0.02	300,000	-4,642	-11,825	-16642	154,615	145,385
14	1993	4	0.03	-1.00	-0.03	300,000	-8160	291840	2.57	116546	0.02	-1.00	-0.02	300,000	-4,722	-12,156	-12882	141,733	158,267
15	1994	4	0.03	-1.00	-0.03	300,000	-9000	291000	2.62	114318	0.02	-1.00	-0.02	300,000	-4,873	-12,787	-13873	127,860	172,140
16	1995	3	0.02	-1.00	-0.02	300,000	-7470	292530	2.50	119789	0.02	-1.00	-0.02	300,000	-4,513	-11,303	-11983	115,877	184,123
17	1996	3	0.02	-1.00	-0.02	300,000	-6000	294000	2.52	119240	0.02	-1.00	-0.02	300,000	-4,548	-11,442	-10548	105,329	194,671
18	1997	3	0.02	-1.00	-0.02	300,000	-5220	294780	2.81	106640	0.02	-1.00	-0.02	300,000	-5,440	-15,303	-10660	94,669	205,331
19	1998	5	0.04	-1.00	-0.04	300,000	-12000	288000	3.92	76445	0.03	-1.00	-0.03	300,000	-8,773	-34,429	-20773	73,896	226,104
20	1999	3	0.02	-1.00	-0.02	300,000	-6000	294000	3.80	78947	0.03	-1.00	-0.03	300,000	-8,400	-31,920	-14400	59,496	240,504
21	2000	2	0.01	-1.00	-0.01	300,000	-2430	297570	3.80	78947	0.03	-1.00	-0.03	300,000	-8,400	-31,920	-10830	48,666	251,334
22	2001	1	0.00	-1.00	0.00	300,000	0	300000	3.80	78947	0.03	-1.00	-0.03	300,000	-8,400	-31,920	-8400	40,266	259,734
23	2002	2	0.01	-1.00	-0.01	300,000	-3000	297000	3.80	78947	0.03	-1.00	-0.03	300,000	-8,400	-31,920	-11400	28,866	271,134
24	2003	1	0.00	-1.00	0.00	300,000	0	300000	3.80	78947	0.03	-1.00	-0.03	300,000	-8,400	-31,920	-8400	20,466	279,534
25	2004	2	0.01	-1.00	-0.01	300,000	-3000	297000	3.80	78947	0.03	-1.00	-0.03	300,000	-8,400	-31,920	-11400	9,066	290,934
26	2005	3	0.02	-1.00	-0.02	300,000	-6000	294000	3.79	79216	0.03	-1.00	-0.03	300,000	-8,361	-31,665	-14361	-5,295	294,705
27	2006	4	0.03	-1.00	-0.03	300,000	-9000	291000	3.67	81784	0.03	-1.00	-0.03	300,000	-8,005	-29,362	-17005	-22,299	277,701
28	2007	2	0.01	-1.00	-0.01	300,000	-3000	297000	3.44	87271	0.03	-1.00	-0.03	300,000	-7,313	-25,138	-10313	-32,612	267,388
29	2008	5	0.04	-1.00	-0.04	300,000	-12000	288000	3.34	89933	0.02	-1.00	-0.02	300,000	-7,007	-23,376	-19008	-51,620	248,380
30	2009	1	0.00	-1.00	0.00	300,000	0	300000	3.52	85118	0.03	-1.00	-0.03	300,000	-7,574	-26,693	-7574	-59,193	240,807
31	2010	2	0.01	-1.00	-0.01	300,000	-1980	298020	3.22	93136	0.02	-1.00	-0.02	300,000	-6,663	-21,463	-8643	-67,836	232,164
32	2011	3	0.02	-1.00	-0.02	300,000	-6000	294000	3.06	98039	0.02	-1.00	-0.02	300,000	-6,180	-18,911	-12180	-80,016	219,984
33	2012	2	0.01	-1.00	-0.01	300,000	-3000	297000	3.09	97125	0.02	-1.00	-0.02	300,000	-6,266	-19,356	-9266	-89,283	210,717
34	2013	2	0.01	-1.00	-0.01	300,000	-3000	297000	3.15	95211	0.02	-1.00	-0.02	300,000	-6,453	-20,332	-9453	-98,736	201,264
35	2014	3	0.02	-1.00	-0.02	300,000	-6000	294000	3.27	91663	0.02	-1.00	-0.02	300,000	-6,819	-22,316	-12819	-111,554	188,446
36	2015	2	0.01	-1.00	-0.01	300,000	-3000	297000	3.91	76815	0.03	-1.00	-0.03	300,000	-8,717	-34,042	-11717	-123,271	176,729
37	2016	4	0.03	-1.00	-0.03	300,000	-9000	291000	4.00	75000	0.03	-1.00	-0.03	300,000	-9,000	-36,000	-18000	-141,271	158,729
38	2017	5	0.04	-1.00	-0.04	300,000	-12000	288000	4.60	65217	0.04	-1.00	-0.04	300,000	-10,800	-49,680	-22800	-164,071	135,929
39	2018	6	0.05	-1.00	-0.05	300,000	-13500	286500	5.00	60000	0.04	-1.00	-0.04	300,000	-12,000	-60,000	-25500	-189,571	110,429
40	2019	6	0.05	-1.00	-0.05	300,000	-14700	285300	5.25	57143	0.04	-1.00	-0.04	300,000	-12,750	-66,938	-27450	-217,021	82,979
41	2020	6	0.05	-1.00	-0.05	300,000	-15300	284700	6.00	50000	0.05	-1.00	-0.05	300,000	-15,000	-90,000	-30300	-247,321	52,679
42	2021	6	0.05	-1.00	-0.05	300,000	-16050	283950	6.20	48387	0.05	-1.00	-0.05	300,000	-15,600	-96,720	-31650	-278,971	21,029
43	2022	6	0.05	-1.00	-0.05	300,000	-16350	283650	6.50	46154	0.06	-1.00	-0.06	300,000	-16,500	-107,250	-32850	-311,821	-11,821
44	2023	7	0.06	-1.00	-0.06	300,000	-17700	282300	7.00	42857	0.06	-1.00	-0.06	300,000	-18,000	-126,000	-35700	-347,521	-47,521
45	2024	7	0.06	-1.00	-0.06	300,000	-18000	282000	7.35	40816	0.06	-1.00	-0.06	300,000	-19,050	-140,018	-37050	-384,571	-84,571
46	2025	7	0.06	-1.00	-0.06	300,000	-18450	281550	7.80	38462	0.07	-1.00	-0.07	300,000	-20,400	-159,120	-38850	-423,421	-123,421
47	2026	7	0.06	-1.00	-0.06	300,000	-18870	281130	8.00	37500	0.07	-1.00	-0.07	300,000	-21,000	-168,000	-39870	-463,291	-163,291
48	2027	7	0.06	-1.00	-0.06	300,000	-19170	280830	8.15	36810	0.07	-1.00	-0.07	300,000	-21,450	-174,818	-40620	-503,911	-203,911
49	2028	8	0.07	-1.00	-0.07	300,000	-20550	279450	8.40	35714	0.07	-1.00	-0.07	300,000	-22,200	-186,480	-42750	-546,661	-246,661
50	2029	8	0.07	-1.00	-0.07	300,000	-20880	279120	8.67	34602	0.08	-1.00	-0.08	300,000	-23,010	-199,497	-43890	-590,551	-290,551
51	2030	8	0.07	-1.00	-0.07	300,000	-21000	279000	9.50	31579	0.09	-1.00	-0.09	300,000	-25,500	-242,250	-46500	-637,051	-337,051

Source: World Bank (2017)

Table 4: Malaysian EPF Real Value with an Amount of RM 400,000 (1980-2030)

PER	Year	I%	ΔI	COf.-1	ΔCPI	PA	CPI*	EPF-DRV	XR	EPFus$	ΔXR	Cof.-1	ΔXR*	PA	XR*	EPF-IRV	EPF-d	+EPF	EPF-RV
1	1980	7	0.00	-1.00	0.00	400,000	0	400000	2.18	183749	0.00	-1.00	0.00	400,000	0	0	0	400,000	0
2	1981	10	0.09	-1.00	-0.09	400,000	-34800	365200	2.30	173602	0.01	-1.00	-0.01	400,000	-5,216	-12,019	-40016	359,984	40,016
3	1982	6	0.05	-1.00	-0.05	400,000	-19276	380724	2.34	171277	0.01	-1.00	-0.01	400,000	-5,342	-12,475	-24617	335,366	64,634
4	1983	4	0.03	-1.00	-0.03	400,000	-10817	389183	2.32	172321	0.01	-1.00	-0.01	400,000	-5,285	-12,268	-16102	319,264	80,736
5	1984	4	0.03	-1.00	-0.03	400,000	-12000	388000	2.34	170675	0.01	-1.00	-0.01	400,000	-5,375	-12,596	-17375	301,890	98,110
6	1985	0.3	-0.01	-1.00	0.01	400,000	2800	402800	2.48	161093	0.01	-1.00	-0.01	400,000	-5,932	-14,730	-3132	298,758	101,242
7	1986	1	0.00	-1.00	0.00	400,000	0	400000	2.58	154952	0.02	-1.00	-0.02	400,000	-6,326	-16,330	-6326	292,432	107,568
8	1987	0.3	-0.01	-1.00	0.01	400,000	2840	402840	2.52	158753	0.02	-1.00	-0.02	400,000	-6,079	-15,316	-3239	289,193	110,807
9	1988	3	0.02	-1.00	-0.02	400,000	-7240	392760	2.62	152743	0.02	-1.00	-0.02	400,000	-6,475	-16,957	-13715	275,478	124,522
10	1989	3	0.02	-1.00	-0.02	400,000	-6480	393520	2.71	147665	0.02	-1.00	-0.02	400,000	-6,835	-18,516	-13315	262,163	137,837
11	1990	3	0.02	-1.00	-0.02	400,000	-8000	392000	2.70	147881	0.02	-1.00	-0.02	400,000	-6,820	-18,446	-14820	247,343	152,657
12	1991	4	0.03	-1.00	-0.03	400,000	-12000	388000	2.75	145451	0.02	-1.00	-0.02	400,000	-7,000	-19,251	-19000	228,343	171,657
13	1992	5	0.04	-1.00	-0.04	400,000	-16000	384000	2.55	157024	0.02	-1.00	-0.02	400,000	-6,190	-15,767	-22190	206,154	193,846
14	1993	4	0.03	-1.00	-0.03	400,000	-10880	389120	2.57	155394	0.02	-1.00	-0.02	400,000	-6,296	-16,207	-17176	188,977	211,023
15	1994	4	0.03	-1.00	-0.03	400,000	-12000	388000	2.62	152424	0.02	-1.00	-0.02	400,000	-6,497	-17,050	-18497	170,480	229,520
16	1995	3	0.02	-1.00	-0.02	400,000	-9960	390040	2.50	159719	0.02	-1.00	-0.02	400,000	-6,018	-15,071	-15978	154,502	245,498
17	1996	3	0.02	-1.00	-0.02	400,000	-8000	392000	2.52	158986	0.02	-1.00	-0.02	400,000	-6,064	-15,256	-14064	140,439	259,561
18	1997	3	0.02	-1.00	-0.02	400,000	-6960	393040	2.81	142187	0.02	-1.00	-0.02	400,000	-7,253	-20,403	-14213	126,226	273,774
19	1998	5	0.04	-1.00	-0.04	400,000	-16000	384000	3.92	101927	0.03	-1.00	-0.03	400,000	-11,698	-45,905	-27698	98,528	301,472
20	1999	3	0.02	-1.00	-0.02	400,000	-8000	392000	3.80	105263	0.03	-1.00	-0.03	400,000	-11,200	-42,560	-19200	79,328	320,672
21	2000	2	0.01	-1.00	-0.01	400,000	-3240	396760	3.80	105263	0.03	-1.00	-0.03	400,000	-11,200	-42,560	-14440	64,888	335,112
22	2001	1	0.00	-1.00	0.00	400,000	0	400000	3.80	105263	0.03	-1.00	-0.03	400,000	-11,200	-42,560	-11200	53,688	346,312
23	2002	2	0.01	-1.00	-0.01	400,000	-4000	396000	3.80	105263	0.03	-1.00	-0.03	400,000	-11,200	-42,560	-15200	38,488	361,512
24	2003	1	0.00	-1.00	0.00	400,000	0	400000	3.80	105263	0.03	-1.00	-0.03	400,000	-11,200	-42,560	-11200	27,288	372,712
25	2004	2	0.01	-1.00	-0.01	400,000	-4000	396000	3.80	105263	0.03	-1.00	-0.03	400,000	-11,200	-42,560	-15200	12,088	387,912
26	2005	3	0.02	-1.00	-0.02	400,000	-8000	392000	3.79	105622	0.03	-1.00	-0.03	400,000	-11,148	-42,220	-19148	-7,060	392,940
27	2006	4	0.03	-1.00	-0.03	400,000	-12000	388000	3.67	109046	0.03	-1.00	-0.03	400,000	-10,673	-39,149	-22673	-29,733	370,267
28	2007	2	0.01	-1.00	-0.01	400,000	-4000	396000	3.44	116361	0.02	-1.00	-0.02	400,000	-9,750	-33,517	-13750	-43,483	356,517
29	2008	5	0.04	-1.00	-0.04	400,000	-16000	384000	3.34	119910	0.02	-1.00	-0.02	400,000	-9,343	-31,168	-25343	-68,826	331,174
30	2009	1	0.00	-1.00	0.00	400,000	0	400000	3.52	113491	0.03	-1.00	-0.03	400,000	-10,098	-35,590	-10098	-78,924	321,076
31	2010	2	0.01	-1.00	-0.01	400,000	-2640	397360	3.22	124182	0.02	-1.00	-0.02	400,000	-8,884	-28,617	-11524	-90,449	309,551
32	2011	3	0.02	-1.00	-0.02	400,000	-8000	392000	3.06	130719	0.02	-1.00	-0.02	400,000	-8,240	-25,214	-16240	-106,689	293,311
33	2012	2	0.01	-1.00	-0.01	400,000	-4000	396000	3.09	129500	0.02	-1.00	-0.02	400,000	-8,355	-25,808	-12355	-119,044	280,956
34	2013	2	0.01	-1.00	-0.01	400,000	-4000	396000	3.15	126948	0.02	-1.00	-0.02	400,000	-8,604	-27,109	-12604	-131,647	268,353
35	2014	3	0.02	-1.00	-0.02	400,000	-8000	392000	3.27	122217	0.02	-1.00	-0.02	400,000	-9,091	-29,755	-17091	-148,739	251,261
36	2015	2	0.01	-1.00	-0.01	400,000	-4000	396000	3.91	102420	0.03	-1.00	-0.03	400,000	-11,622	-45,390	-15622	-164,361	235,639
37	2016	4	0.03	-1.00	-0.03	400,000	-12000	388000	4.00	100000	0.03	-1.00	-0.03	400,000	-12,000	-48,000	-24000	-188,361	211,639
38	2017	5	0.04	-1.00	-0.04	400,000	-16000	384000	4.60	86957	0.04	-1.00	-0.04	400,000	-14,400	-66,240	-30400	-218,761	181,239
39	2018	6	0.05	-1.00	-0.05	400,000	-18000	382000	5.00	80000	0.04	-1.00	-0.04	400,000	-16,000	-80,000	-34000	-252,761	147,239
40	2019	6	0.05	-1.00	-0.05	400,000	-19600	380400	5.25	76190	0.04	-1.00	-0.04	400,000	-17,000	-89,250	-36600	-289,361	110,639
41	2020	6	0.05	-1.00	-0.05	400,000	-20400	379600	6.00	66667	0.05	-1.00	-0.05	400,000	-20,000	-120,000	-40400	-329,761	70,239
42	2021	6	0.05	-1.00	-0.05	400,000	-21400	378600	6.20	64516	0.05	-1.00	-0.05	400,000	-20,800	-128,960	-42200	-371,961	28,039
43	2022	6	0.05	-1.00	-0.05	400,000	-21800	378200	6.50	61538	0.06	-1.00	-0.06	400,000	-22,000	-143,000	-43800	-415,761	-15,761
44	2023	7	0.06	-1.00	-0.06	400,000	-23600	376400	7.00	57143	0.06	-1.00	-0.06	400,000	-24,000	-168,000	-47600	-463,361	-63,361
45	2024	7	0.06	-1.00	-0.06	400,000	-24000	376000	7.35	54422	0.06	-1.00	-0.06	400,000	-25,400	-186,690	-49400	-512,761	-112,761
46	2025	7	0.06	-1.00	-0.06	400,000	-24600	375400	7.80	51282	0.07	-1.00	-0.07	400,000	-27,200	-212,160	-51800	-564,561	-164,561
47	2026	7	0.06	-1.00	-0.06	400,000	-25160	374840	8.00	50000	0.07	-1.00	-0.07	400,000	-28,000	-224,000	-53160	-617,721	-217,721
48	2027	7	0.06	-1.00	-0.06	400,000	-25560	374440	8.15	49080	0.07	-1.00	-0.07	400,000	-28,600	-233,090	-54160	-671,881	-271,881
49	2028	8	0.07	-1.00	-0.07	400,000	-27400	372600	8.40	47619	0.07	-1.00	-0.07	400,000	-29,600	-248,640	-57000	-728,881	-328,881
50	2029	8	0.07	-1.00	-0.07	400,000	-27840	372160	8.67	46136	0.08	-1.00	-0.08	400,000	-30,680	-265,996	-58520	-787,401	-387,401
51	2030	8	0.07	-1.00	-0.07	400,000	-28000	372000	9.50	42105	0.09	-1.00	-0.09	400,000	-34,000	-323,000	-62000	-849,401	-449,401

Source: World Bank (2017)

Table 5: Malaysian EPF Real Value with an Amount of RM 500,000 (1980-2030)

PER	Year	I%	ΔI	C0f.-1	ΔCPI	PA	CPI*	EPF-DRV	XR	EPFus$	ΔXR	Cof.-1	ΔXR*	PA	XR*	EPF-IRV	EPF-d	+EPF	EPF-RV
							EPF COMPETITIVINESS (Value = RM500,000)												
1	1980	7	0.00	-1.00	1.00	500,000	0	500,000	2.18	229686	0.00	-1.00	0.00	500,000	0	0	0	500,000	0
2	1981	10	0.09	-1.00	-0.09	500,000	-43500	456500	2.30	217002	0.01	-1.00	-0.01	500,000	-6,521	-15,024	-50021	449,979	50,021
3	1982	6	0.05	-1.00	-0.05	500,000	-24095	475905	2.34	214097	0.01	-1.00	-0.01	500,000	-6,677	-15,593	-30771	419,208	80,792
4	1983	4	0.03	-1.00	-0.03	500,000	-13521	486479	2.32	215401	0.01	-1.00	-0.01	500,000	-6,606	-15,335	-20127	399,080	100,920
5	1984	4	0.03	-1.00	-0.03	500,000	-15000	485000	2.34	213343	0.01	-1.00	-0.01	500,000	-6,718	-15,745	-21718	377,362	122,638
6	1985	0.3	-0.01	-1.00	0.01	500,000	3500	503500	2.48	201366	0.01	-1.00	-0.01	500,000	-7,415	-18,412	-3915	373,447	126,553
7	1986	1	0.00	-1.00	0.00	500,000	0	500000	2.58	193690	0.02	-1.00	-0.02	500,000	-7,907	-20,412	-7907	365,540	134,460
8	1987	0.3	-0.01	-1.00	0.01	500,000	3550	503550	2.52	198441	0.02	-1.00	-0.02	500,000	-7,598	-19,145	-4048	361,492	138,508
9	1988	3	0.02	-1.00	-0.02	500,000	-9050	490950	2.62	190928	0.02	-1.00	-0.02	500,000	-8,094	-21,196	-17144	344,348	155,652
10	1989	3	0.02	-1.00	-0.02	500,000	-8100	491900	2.71	184581	0.02	-1.00	-0.02	500,000	-8,544	-23,145	-16644	327,704	172,296
11	1990	3	0.02	-1.00	-0.02	500,000	-10000	490000	2.70	184851	0.02	-1.00	-0.02	500,000	-8,524	-23,057	-18524	309,179	190,821
12	1991	4	0.03	-1.00	-0.03	500,000	-15000	485000	2.75	181814	0.02	-1.00	-0.02	500,000	-8,750	-24,064	-23750	285,429	214,571
13	1992	5	0.04	-1.00	-0.04	500,000	-20000	480000	2.55	196280	0.02	-1.00	-0.02	500,000	-7,737	-19,709	-27737	257,692	242,308
14	1993	4	0.03	-1.00	-0.03	500,000	-13600	486400	2.57	194243	0.02	-1.00	-0.02	500,000	-7,870	-20,259	-21470	236,221	263,779
15	1994	4	0.03	-1.00	-0.03	500,000	-15000	485000	2.62	190530	0.02	-1.00	-0.02	500,000	-8,121	-21,312	-23121	213,100	286,900
16	1995	3	0.02	-1.00	-0.02	500,000	-12450	487550	2.50	199648	0.02	-1.00	-0.02	500,000	-7,522	-18,838	-19972	193,128	306,872
17	1996	3	0.02	-1.00	-0.02	500,000	-10000	490000	2.52	198733	0.02	-1.00	-0.02	500,000	-7,580	-19,070	-17580	175,548	324,452
18	1997	3	0.02	-1.00	-0.02	500,000	-8700	491300	2.81	177734	0.02	-1.00	-0.02	500,000	-9,066	-25,504	-17766	157,782	342,218
19	1998	5	0.04	-1.00	-0.04	500,000	-20000	480000	3.92	127409	0.03	-1.00	-0.03	500,000	-14,622	-57,382	-34622	123,161	376,839
20	1999	3	0.02	-1.00	-0.02	500,000	-10000	490000	3.80	131579	0.03	-1.00	-0.03	500,000	-14,000	-53,200	-24000	99,161	400,839
21	2000	2	0.01	-1.00	-0.01	500,000	-4050	495950	3.80	131579	0.03	-1.00	-0.03	500,000	-14,000	-53,200	-18050	81,111	418,889
22	2001	1	0.00	-1.00	0.00	500,000	0	500000	3.80	131579	0.03	-1.00	-0.03	500,000	-14,000	-53,200	-14000	67,111	432,889
23	2002	2	0.01	-1.00	-0.01	500,000	-5000	495000	3.80	131579	0.03	-1.00	-0.03	500,000	-14,000	-53,200	-19000	48,111	451,889
24	2003	1	0.00	-1.00	0.00	500,000	0	500000	3.80	131579	0.03	-1.00	-0.03	500,000	-14,000	-53,200	-14000	34,111	465,889
25	2004	2	0.01	-1.00	-0.01	500,000	-5000	495000	3.80	131579	0.03	-1.00	-0.03	500,000	-14,000	-53,200	-19000	15,111	484,889
26	2005	3	0.02	-1.00	-0.02	500,000	-10000	490000	3.79	132027	0.03	-1.00	-0.03	500,000	-13,935	-52,775	-23935	-8,825	491,175
27	2006	4	0.03	-1.00	-0.03	500,000	-15000	485000	3.67	136307	0.03	-1.00	-0.03	500,000	-13,341	-48,937	-28341	-37,166	462,834
28	2007	2	0.01	-1.00	-0.01	500,000	-5000	495000	3.44	145452	0.02	-1.00	-0.02	500,000	-12,188	-41,897	-17188	-54,354	445,646
29	2008	5	0.04	-1.00	-0.04	500,000	-20000	480000	3.34	149888	0.02	-1.00	-0.02	500,000	-11,679	-38,960	-31679	-86,033	413,967
30	2009	1	0.00	-1.00	0.00	500,000	0	500000	3.52	141864	0.03	-1.00	-0.03	500,000	-12,623	-44,488	-12623	-98,655	401,345
31	2010	2	0.01	-1.00	-0.01	500,000	-3300	496700	3.22	155227	0.02	-1.00	-0.02	500,000	-11,105	-35,772	-14405	-113,061	386,939
32	2011	3	0.02	-1.00	-0.02	500,000	-10000	490000	3.06	163399	0.02	-1.00	-0.02	500,000	-10,300	-31,518	-20300	-133,361	366,639
33	2012	2	0.01	-1.00	-0.01	500,000	-5000	495000	3.09	161875	0.02	-1.00	-0.02	500,000	-10,444	-32,259	-15444	-148,805	351,195
34	2013	2	0.01	-1.00	-0.01	500,000	-5000	495000	3.15	158684	0.02	-1.00	-0.02	500,000	-10,755	-33,887	-15755	-164,559	335,441
35	2014	3	0.02	-1.00	-0.02	500,000	-10000	490000	3.27	152772	0.02	-1.00	-0.02	500,000	-11,364	-37,194	-21364	-185,924	314,076
36	2015	2	0.01	-1.00	-0.01	500,000	-5000	495000	3.91	128025	0.03	-1.00	-0.03	500,000	-14,528	-56,737	-19528	-205,451	294,549
37	2016	4	0.03	-1.00	-0.03	500,000	-15000	485000	4.00	125000	0.03	-1.00	-0.03	500,000	-15,000	-60,000	-30000	-235,451	264,549
38	2017	5	0.04	-1.00	-0.04	500,000	-20000	480000	4.60	108696	0.04	-1.00	-0.04	500,000	-18,000	-82,800	-38000	-273,451	226,549
39	2018	6	0.05	-1.00	-0.05	500,000	-22500	477500	5.00	100000	0.04	-1.00	-0.04	500,000	-20,000	-100,000	-42500	-315,951	184,049
40	2019	6	0.05	-1.00	-0.05	500,000	-24500	475500	5.25	95238	0.04	-1.00	-0.04	500,000	-21,250	-111,563	-45750	-361,701	138,299
41	2020	6	0.05	-1.00	-0.05	500,000	-25500	474500	6.00	83333	0.05	-1.00	-0.05	500,000	-25,000	-150,000	-50500	-412,201	87,799
42	2021	6	0.05	-1.00	-0.05	500,000	-26750	473250	6.20	80645	0.05	-1.00	-0.05	500,000	-26,000	-161,200	-52750	-464,951	35,049
43	2022	6	0.05	-1.00	-0.05	500,000	-27250	472750	6.50	76923	0.06	-1.00	-0.06	500,000	-27,500	-178,750	-54750	-519,701	-19,701
44	2023	7	0.06	-1.00	-0.06	500,000	-29500	470500	7.00	71429	0.06	-1.00	-0.06	500,000	-30,000	-210,000	-59500	-579,201	-79,201
45	2024	7	0.06	-1.00	-0.06	500,000	-30000	470000	7.35	68027	0.06	-1.00	-0.06	500,000	-31,750	-233,363	-61750	-640,951	-140,951
46	2025	7	0.06	-1.00	-0.06	500,000	-30750	469250	7.80	64103	0.07	-1.00	-0.07	500,000	-34,000	-265,200	-64750	-705,701	-205,701
47	2026	7	0.06	-1.00	-0.06	500,000	-31450	468550	8.00	62500	0.07	-1.00	-0.07	500,000	-35,000	-280,000	-66450	-772,151	-272,151
48	2027	7	0.06	-1.00	-0.06	500,000	-31950	468050	8.15	61350	0.07	-1.00	-0.07	500,000	-35,750	-291,363	-67700	-839,851	-339,851
49	2028	8	0.07	-1.00	-0.07	500,000	-34250	465750	8.40	59524	0.07	-1.00	-0.07	500,000	-37,000	-310,800	-71250	-911,101	-411,101
50	2029	8	0.07	-1.00	-0.07	500,000	-34800	465200	8.67	57670	0.08	-1.00	-0.08	500,000	-38,350	-332,495	-73150	-984,251	-484,251
51	2030	8	0.07	-1.00	-0.07	500,000	-35000	465000	9.50	52632	0.09	-1.00	-0.09	500,000	-42,500	-403,750	-77500	-1,061,751	-561,751

Source: World Bank (2017)

About the Authors

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Dr. Mario Arturo Ruiz Estrada (Guatemalan) is currently Senior Research Fellow at SSRC and Associate Fellow in the Centre of Poverty and Development Studies (CPDS) at Faculty of Economics and Administration (FEA) in the University of Malaya (UM), since April 2001. Prior to joining University of Malaya, he was a tenured senior lecturer at Universidad de San Carlos (Guatemala). Dr. Mario Arturo Ruiz Estrada has a Ph.D. in Economics from University of Malaya, Master's degree in Economics from Otaru University (Hokkaido, Japan) and degree in Economics from Universidad de San Carlos (Guatemala). His main research fields are policy modeling, economic modelling, econographicology, natural disasters, terrorism, war and borders conflicts, economic indicators, international trade, and development of socio-economic issues.

His research, which has been published extensively in journals such as Journal of Policy Modeling, Disasters, Quality and Quantity, Singapore Economic Review, Panoeconomicus, Contemporary Economics, Defense and Peace Economics, Procedia Computer Sciences, Malaysian Journal of Economic Studies, Malaysian Journal of Science, and books, that revolves around policy-oriented topics relevant for worldwide long-term development, including policy modeling, natural disasters evaluation, war and border conflicts, social security, and food security issues.

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Norma Mansor is the Director of SSRC, a position she holds since 2013. She is a professor at the Department of Administrative Studies and Politics, Faculty of Economics and Administration, University of Malaya where she served as the Dean from April 2004 to June 2009. She was appointed as Secretary of the National Economic Advisory Council in Prime Minister's Department from July 2009 to May 2011. She was a Ragnar Nurkse Visiting Professor at Talinn University of Technology, Estonia in 2015. Prior to these appointments, she has served as advisor and consultant to various government bodies and private organizations which include The National Institute Of Public Administration (INTAN), Sarawak Economic Development Corporation (SEDC), Federal Agricultural Marketing Authority (FAMA), The United Nations Development Programme (UNDP), World Bank, International Labor Organization (ILO), Organisation for Economic Co-operation and Development (OECD) and the European Union (EU).

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