A SIMULATION MODEL TO ILLUSTRATE FINANCIAL ACTIVITIES OF MALAYSIAN PENSION FUND

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Abstract - Nowadays, pension spending is expected to grow substantially since the populations' are aging and the number of retirees increases. Some countries have started planning to amend the pensioners' retirement benefit to sustain their pension systems. For strategic planning, it is important to assess the financial condition of a pension fund. Therefore, this paper described several factors influencing the financial activities of pension funds. Next, a dynamic simulation model is developed as well as stock and flow diagram to study the interrelationships among the influencing factors. Malaysia public pension fund system is used to illustrate the simulation model.

Keywords - Financial Activities, Pension Fund, System Dynamics.

I. INTRODUCTION

Globally, there are economic crisis in influencing pension funding. Specially, in the context of public pension fund; the retirement crisis is dramatically affected [1]. From the global perspective, countries are cutting the retirement benefits and raising the age to start collecting them. On the other hand, countries are facing critical financial crisis and debts after the recession has affected [2].

The countries, especially in Asia have a very slow rate of recovery from recession. In addition to that the economies are facing a demographic growth as the retirees live longer and birth rate is continuously falling [3]. It means that there will be an imbalance between the workers and retirees to pay. Publicly and privately held companies are excluding traditional pension plans that assures employees a monthly compensation who check in retirement [4].

A. Malaysian Perspective

The Malaysian government has a concern to develop a pension scheme that can be approved by legislation and fulfill the needs of public employees as employees needed to be protected against many financial challenges. The eligibility to avail the facility of pension is the objective of government administration to provide a pension scheme that covers those employees who are working in the public sector. As in the private and public sector, some portion of thewage is deducted as a provident fund and at the time of retirement, the sum is given to the public and private employees. The people who are working in government, statutory bodies and local authorities are public sector employees [5]. Table 1 shows the pension assets in 10 Asian economies.

	AUS	CHN	HKG	KOR	IND	MLY	NZL	PAK	SGP	THL	Total
2001	185,581	3,050	4,618	58,792	618	48,570	11,954	773	51,471	3,573	369,001
2002	200,335	3,812	7,060	74,415	857	53,605	11,157	986	53,850	4,445	410,523
2003	271,430	4,765	11,482	94,410	1,278	58,476	10,140	1,200	59,431	5,747	518,359
2004	387,363	5,956	15,432	116,387	2,352	63,868	10,702	1,401	66,189	6,138	675,788
2005	487,569	8,298	19,462	152,326	3,825	70,030	11,324	1,613	71,971	7,135	833,553
2006	594,375	11,413	26,057	230,926	4,147	78,921	12,797	1,824	79,175	8,467	1,048,101
2007	825,001	19,980	33,941	267,475	5,314	92,193	12,589	2,172	90,629	10,880	1,360,175
2008	695,441	27,502	26,902	213,240	5,790	104,829	12,823	2,193	106,941	11,759	1,207,420
2009	787,733	36,962	39,845	217,416	5,993	113,108	14,736	2,229	114,680	12,508	1,345,210
2010	995,385	41,357	47,037	279,830	7,755	141,090	17,424	2,523	136,331	15,242	1,683,973

Source: Reference[6]

Table 1: Pension Assets in the 10 Selected Asia-Pacific Economies, in US$ million

The benefits allocated to the Public pensionable employees are:

1. Retirement benefits including monthly pension, gratuity and cash award for accumulated leave.
2. Survivors' benefits including derivative for pension and gratuity and dependent's pension.
3. Disability pension.

Reference[5] has argued that the Malaysian Government pension scheme is retirement base plans. The government has realized the significance of providing survivor benefits which are of immediate concern for the welfare of Malaysian government employee's families. The major task is to compensate a compatible financial aid to the family who has permanently lost their financial support. This includes the surviving spouse and children. On the other hand, disability pension is allocated where a public servant retires due to accidents or diseases while performing his duty or due to the travel accident. The measure of disability pension fund will depend on the degree of impairment. The pension benefits can be received when employees have reached the eligible retirement age that is 55 years old. There is an optional pre-retirement age of 50 years for men and 45 years for women. Ifthese criteria are not fulfilled,the employee need to provide the medical justification or certificate unfit for work as a result of disease or accident. It is required that public employees must have at least ten years' of service. It is including a probationary period of three years before eligible for a pension [5].

B. Pension Fund

The Malaysian labour law has defined the regulation and employment by explaining pension as a fund paid to an individual in a specific condition, who is following retirement or to surviving dependents. According to the pension act 1980; that it should be treated under gratuity, pension or other benefits provided shall be charged on the Federal Consolidated Fund. This act of pension has come into implementation on the 1st January 1976. The cash award granted in lieu is not included in the pension fund. It is also not accumulated by vacation leave to an employee whose salary is not paid out of the Federal Consolidated Fund. The public servant refers to a public servant or a government employee of any statutory or local authority who before to his/her retirement or expiration, was serviced in Malaysia or in any of the boundaries which exist under Malaysian territory [7].

C. Public Pension Fund

Malaysian public servants take pleasure in the pension benefits after retirement. Even if the pensioner is dead, his/her beneficiary will continue to enjoy the pension benefits until their death. If a dead pensioner has children under the age of 18, the pension will be distributed equally among them. In addition, public servant will receive a sum of the gratuity payment which is calculated based on their years of service and paid at the end of their services. In the case of death before retirement, that gratuity will be given to the spouse or to the next of kin. Apart from that, the public servants also receive benefits in terms of the home financing scheme known as the Mortgage Reducing Term Assurance (MRTA). Under this scheme, if the public servant died before their financing payment ends, the outstanding balance will be covered by MRTA and the house will be given as beneficiary to the nominee [8].

In Malaysia, the number of pensioners that reach compulsory retirement age are growing. This can be seen in the increasing number of pensioners from 444 pensioners in 1969 to 200,000 pensioners in 2007. Also, with the growing numbers of public workers, which there were more than 1.2 million workers in the public sector and there were 351,568 pensioners and 144,712 pension recipients [9]. These figures involve an estimated pension expenditure of more than RM7,040 million throughout 2007 [9]. In 1991, Pension Trust Fund (PTF) has been established by the Malaysian government due to the increment in the burden of retirement benefits which is payable to public sector employees. The established trust fund is functioning to finance its pension liability. Additionally, RM500 million was granted by the Federal Government to the pension trust fund. Later, in March 2007, the Pensions Trust Fund was replaced by Kumpulan Wang Persaraan (KWAP) or Retirement Fund.Hence, KWAP took over all powers, assets and liabilities, functions as well as the activities of the Pensions Trust Fund. The major role of KWAP is to monitor as well as to manage the established fund towards achieving optimal returns on its investments. Despite this, the fund can also be applied towards assisting the Federal Government in funding its pension liability.

Kumpulan Wang Persaraan is one of the pension fund in Malaysia. Pension fund plays an important role in funding the retirement benefit due to the life expectancy increment in the world's population, especially the population of people aged 60 years and above. Therefore, the financial condition of this fund should be assessed. As a result, this study aims to develop a model which describes financial activities in the Malaysia Pension Fund particularly KWAP. The model will identify KWAP main sources as well as behavioral patterns of asset allocation in KWAP investments as in [10]. The simulation model constructed focus' is only on policy-related investigation.

II. RESEARCH METHODOLOGY

System Dynamics (SD) is one of the computer simulation techniques, which is powerful in order to study complex systems. Originally, SD was invented by Jay W. Forrester from Massachusetts Institute of Technology and it was based on feedback control theory which include both quantitative and qualitative approaches. These two approaches are vital in analyzing the dynamic behaviors of a complex system in the real world [11]. The strength of SD lies on its capabilities to enhance the decision making process and policy formation. This includes its characteristics of incorporating all the relevant causal relationships and feedback loops in a dynamic behavior. In addition,

with the virtue of computer simulation, SD can be used to solve a dynamic and complex system including the problem of investigating the financial condition of the Malaysia pension fund. From the review of literatures [10], [12], [13], the authors have summarized various factors influencing the financial condition pension fund. Next, based on the set of system factors in literature summarization, it will be transferred into a simulation model.

A. The Stocks and Flows Structure

The SD model comprises of variables such as stocks, flows, converters, and connectors. Fig.1 depicts major elements in an SD model and the model can be constructed using these variables. Stock or also known as levels is the entity which acts as a reservoir or tub functioning to accumulate quantities. It is represented by a rectangle and describe the current condition of the system. The flow increases (inflow) and decreases (outflow) of a stock is also known as rates (represented by valve). Stock depends on the rates, while the rates can be affected by a factor affecting the inflow or outflow, which is known as a converter or auxiliaries (represented by circles). Finally, single-line arrow functions as the connectors that represent the causal link within the model structure [11].

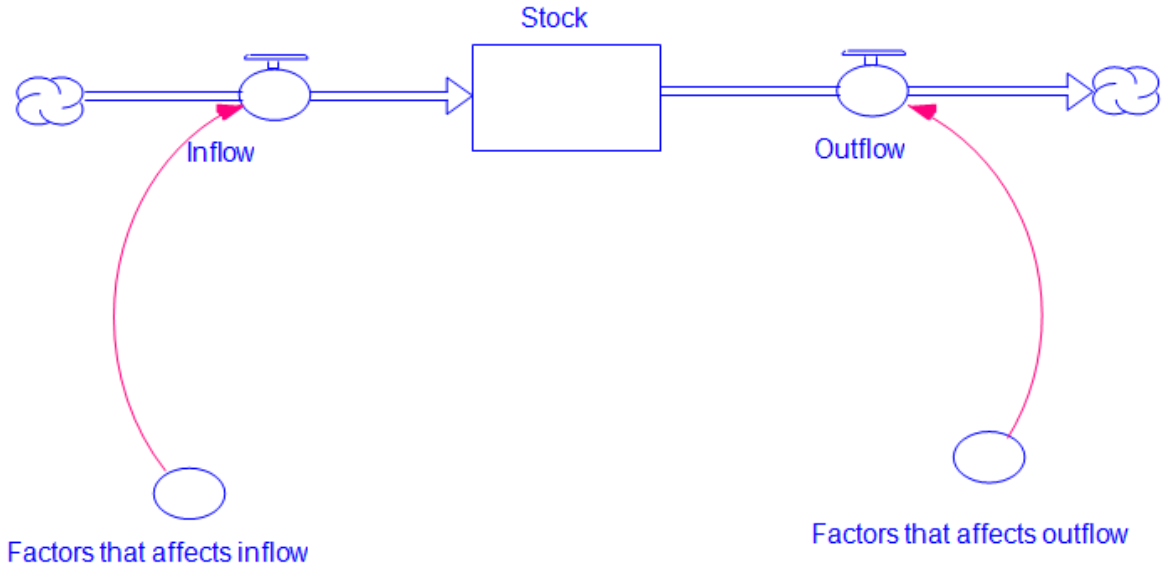


Fig. 1: The main elements in a system dynamics model

III. MODEL DEVELOPMENT

A. System Analysis

To begin the process, the ability of KWAP to finance pension expenditure for the growing number of pensioners in Malaysia should be measured in order to achieve KWAP main objective. Currently, to the best of our knowledge, there is no study that has been done to measure KWAP ability to finance pension expenditure. Therefore, this study will develop a model to analyze the financial activities of KWAP. The system dynamics simulation approach will be utilized as a technique for developing the model. This simulation model could be used by KWAP to identify their current financial condition.

B. Stock and Flow Diagram Development

In this section, stock and flow diagram is developed prior to the model development. The purpose of stock and flow development is to map the financial activities and its interactions for better understanding. Initially, for the purpose of this study, the activities of the Malaysia pension fund which is also known as Kumpulan Wang Amanah Pencen (KWAP) are explored. Related information was gathered through literature review and KWAP official website to evaluate the financial activities of the pension fund as represented in Fig. 2. Currently, pension liability is beared by the Federal government. Kumpulan Wang Amanah Pencen (KWAP) solely in charge of managing pension contributions from contributing employers and conducting investment activities. The contributing employer is sub-divided into two types of employers which are federal contribution and state contribution as illustrated in Fig. 2. The employers are responsible to contribute the pension contributions for employees who are granted pensionable status by the Public Service Department. Apart from that, employers are also responsible to pay pension contributions for its pensionable employees at the rate of 17.5% of the basic salaries of the employees. Hence, this indicates that a portion of 17.5% of the total salary of state and federal employees will be contributed into the pension fund. Consequently, the increment in total salary, which also lead to an increment in total contribution. Then, all the contributions will be further invested in pension asset and asset allocation model will determine the amount of pension asset placed into each class. The term ‘asset allocation’ refers to the practice of segregating resources among several categories. The example of categories of resources are equity, fixed deposits, government securities, and

alternative investments, as reported in KWAP annual report. Each of the investment return in each of the categories will be returned to the pension asset. Thus, pension asset increase due to the total contribution from federal and state government, also from total return on investment. Other than that, asset allocation percentage (in the investment) changed due to the increment/changes in the amount of pension asset. In the future, pension asset will be used to finance pension liability such as annuities, gratuity, and cash in lieu of leave. Therefore, pension asset will decrease/changes due to payment of pension benefits. The developed system dynamics model which is the stock and flow diagram described pension fund activities with asset allocation assigned, which are Equity, Fixed Deposits, Government Securities and Alternative investment.

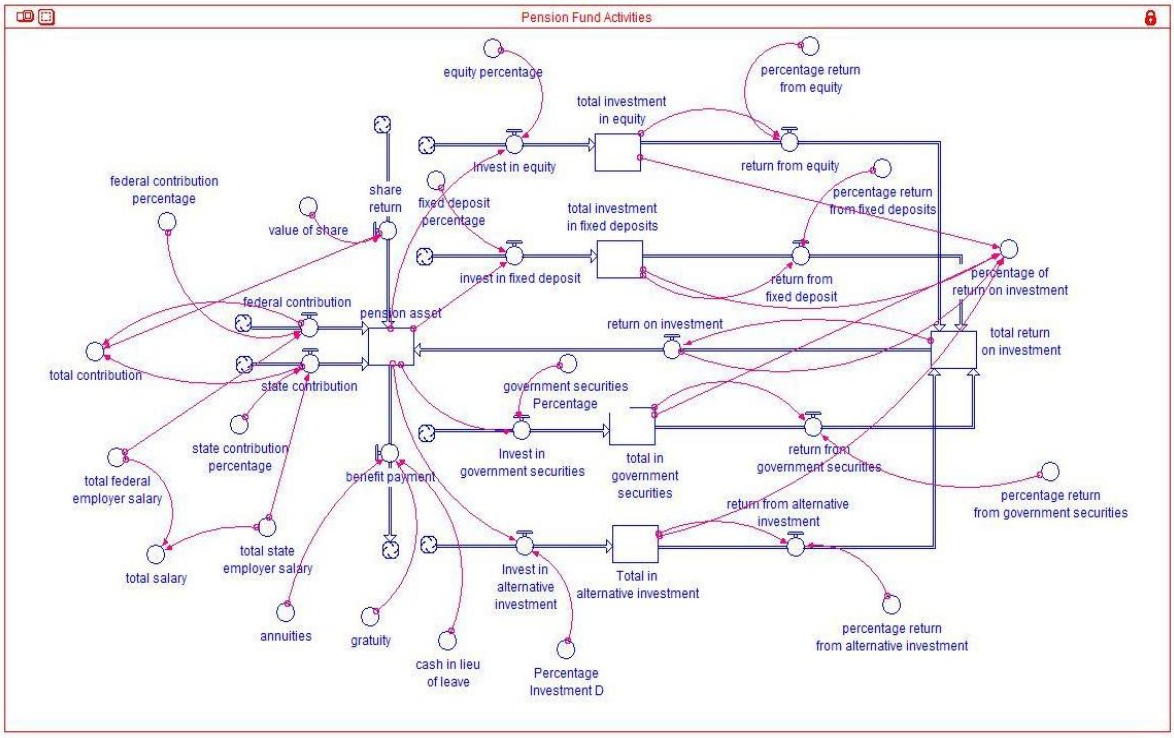


Fig. 2: Stock and Flow Diagram of Pension Fund Activities

In the stock and flow diagram of investment activities, pension asset is divided into asset allocation. Asset allocation is divided into four categories, which are total investment in A, total investment in B, total investment in C and total investment in D. In KWAP portfolio, these total investments are categorized asequity, fixed deposits, government securities, money market, exchange traded funds and alternative investments. An increase in total investments caused by an investment in each category. An investment in each category is affected by percentage of investment. Then, total investment in each category will generate a return and percentage of return. The return from each category will affect the total return on investment and pension asset. Then, the percentage of return on investment is calculated based on return on investment and total investment.

CONCLUSION

This paper discusses the simulation model of financial activities of the Malaysia pension fund. The simulation model allows the decision makers of Malaysia pension fund to access the existing factors and its relationships in pension fund financial activities and it can be used to strategize their financial planning.

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