

Public Expenditures on Health in ASEAN Member Countries: An Analysis of Trends and Policy Determinants

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Abstract—The study of the nature of public welfare expenditure in healthcare has gained more attention recently. Many studies suggest that as countries are growing economically, becoming more urbanized and industrialized; their welfare expenditure has also been increased. Other also suggests that countries with higher proportion of older population tend to have larger welfare expenditure. On the other hand, many studies show contradictory findings. This paper thus uses data on ASEAN countries to test the relationship between the factors that have been claimed to have effect on public welfare expenditure, particularly on healthcare. Conducting regression analysis, this study finds that the increase in older persons and industrialization are associated with higher government expenditure on health whereas economic growth, urbanization, old-age dependency ratio, older population and economic openness are negatively correlated with government health expenditure. Despite most of ASEAN countries have relatively developed protection schemes, the scheme are limited to public sector employee and universal coverage, safety net provisions, for the general population is still lacking even though all countries have made commitments to extending social protection. In addressing the issue of ageing, the governments should consider the sustainability of their programs and their short term and long term.

Keyword—Public Expenditure, Health Expenditure, Welfare Expenditure, ASEAN

I. INTRODUCTION

AS the degree of globalization has been increasing in ASEAN countries, the social protection has also become an important public policy issue in recent years. In addition to the pressure from globalization, some ASEAN countries have already been facing pressure from population ageing. With better medical services and technology, and urbanization, fertility rate around the world declines and life expectancy increases. Lower fertility rate and higher life expectancy rate in turn lead to an increase in older persons in the total population. This increasing proportion of older persons in the total population is known as population ageing [1] and this phenomenon is both perceived as one of humanity's greatest achievements and challenges.

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There exists a large amount of literatures on government spending as whole or welfare expenditures in particular. While some attempts to examine the political determinants, others examine the socio-economic determinants of these spending. Political system, institutional state structures and political situations have been used to explain the welfare expenditures in OECD countries. In addition, a lot of literatures focus on the relationship between globalization, industrialization, urbanization, and the welfare spending but the sample countries used for their study is mostly OECD countries.

There is only little literature specifically focuses on how the problem of ageing can affect the welfare spending whether theoretically or empirically, and there is also lack of study on what factors might influence welfare expenditure in ASEAN. Therefore, this study with the aim to find the relationship between dependent variable that is welfare expenditure and the explanatory variables: ageing, economic growth and globalization using ASEAN countries as case studies will contribute to the existing literatures. In addition, this study will also examine welfare policies and programs in ASEAN countries.

This study adds to literature by investigating the existing welfare policies and programs in ASEAN member countries. It also aims to identify the factors affecting the government health expenditure policy, more importantly, how population ageing impact on the health expenditures in the region. The paper also aims to provide recommendations to related agencies for improving public policy and public expenditure in health to match the demand from the society.

II. CONCEPTUAL BACKGROUND

A. Current Trends on ASEAN Aging Population

As of 2009, population in the Southeast Asia region was 590 million, increasing from 355 million in 1980. However, the average population growth rate dropped from 2.1 percent during 1980-1990 to 1.2 percent in 2009 and the population growth rate is expected to drop further in decades to come [2].

By examining ASEAN countries individually, we can see that each country face different degree of population ageing. According to Help Age International, for example, Singapore population aged over 60 years increased from 12.2% in 2005 to 15.5% in 2012 and expected to even reach 38.8% in 2050. Singapore's current world ranking was 57th out of 195

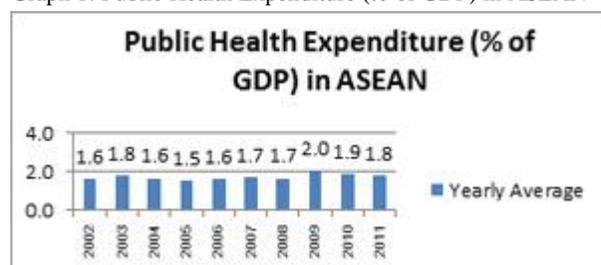
countries and projected to reach the 10th place in 2050. Singapore's life expectancy at birth is 81 years in 2012 and is likely to get higher in the future given better living standards. Likewise, Thailand's population aged over 60 increased from 10.25% in 2005 to 13.7 % in 2012 and projected to reach 31.8 % 2050. Closely following Thailand is VietNam with 7.4 % in 2005 and 8.9 % in 2012 and projected to increase to 30.8 % in 2050, making a high jump from 96th to 53th place in the world ranking. Next on the list are Indonesia and Myanmar whose proportion of population aged 60 and above in 2012 was 8.5 % and projected to increase to 25.5 % and 24.5 relatively. The remaining countries in ASEAN have relatively low older population. Malaysia has 8.3 % older population in 2012 and it ranked 102th in world ranking and projected to reach the 117th world ranking in 2050. Cambodia, Brunei, the Philippines and Laos face less population ageing issue [3]. Despite these countries are in a better position compared to countries like Singapore and Thailand, with their decreasing fertility rate, it is also expected that they will have more aged population in the future.

This demographic change can pose major challenges to developing countries of ASEAN as they are trying to achieve economic growth of their countries. Population ageing is believed to have put pressures on traditional social protection systems because the younger generation cannot support the increasing number of older family and community members. Governments will face the challenges of how to distribute the income in society so that the elderly are not left marginalized, how to ensure income security and how to provide adequate health services. Governments thus will have to consider how much they should spend on things like health, social security, pensions and welfare services.

B. Trends of Health Expenditure in ASEAN

As already mentioned, since data on welfare expenditure in ASEAN countries is not available, we thus make use of public health expenditure, which is a part of welfare expenditure. As shown in the table below, the yearly average of public health expenditure as percent of GDP in ASEAN countries as a whole, does not have an increasing trend. It just went up and down throughout the 10 years period. Starting from year 2009, we can see that the government health expenditure decreased 0.1% every year. Government health expenditure as percent of GDP ranged from 1.5% and 2% during this period.

Graph 1: Public Health Expenditure (% of GDP) in ASEAN

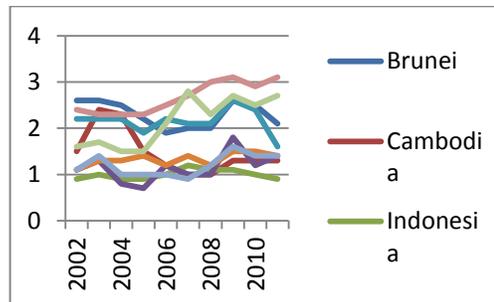


Source: World Bank

Each individual country's spending on health, however, is different. As illustrated in graph 2 below, it is roughly shown that there are two groups of country in terms of their spending on health as percentage of their GDP. Thailand, Brunei,

Malaysia and Vietnam are in the top with their public expenditure higher than 2% in average. On the other hand, Philippines, Singapore, Cambodia, Indonesia and Laos are at the bottom group with their public expenditure share of GDP at 1.5% or less in average during the period 2002-2011.

Graph 2: Public Health Expenditure (% of GDP) of each ASEAN country



Source: World Bank

Examining closer to the per capita government health expenditure in ASEAN countries as shown in Table 1 below, we can see that Brunei has the most generous spending with the average in the ten years period is more than \$1000 per capita. Next on the list is Singapore followed by Malaysia and Thailand. Laos and Cambodia are at the bottom two in terms of their per capita spending on health. In almost every country on this list, there the health spending per capita in general is gradually increasing. As for the yearly average per capita government health expenditure in ASEAN as a whole, we can see that there are the ups and down pattern within this period. However, if we compare the per capita health expenditure in 2002 and 2011, we can conclude that there is a \$94.6 increase which can be considered as being significant.

TABLE I

PER CAPITA GOVERNMENT EXPENDITURE ON HEALTH (PPP INT. \$)

Year	BN	KH	ID	LA	MY	PH	SG	TH	VN	Yearly AVG
2002	1173.7	15.7	21.7	14.7	190.4	28.4	387.9	125.2	25.5	220.4
2003	1213.6	27.4	27.4	18.4	242.5	34.9	517.8	131.7	29.5	249.2
2004	1193.5	29.9	26.9	12.5	232.6	37.4	437.8	142.2	29.3	238.0
2005	1075.6	23.1	28.3	12.4	198.2	41.8	465.5	152.5	33.1	225.6
2006	989	20.5	34.6	22.1	253.1	39.7	481.3	182.3	50.1	230.3
2007	1049.3	18.6	45	21.1	265.3	47.9	502.6	209.5	73	248.0
2008	1027.7	20.9	44.3	21.8	276.3	45.8	651.9	242	64.6	266.1
2009	1290.8	26.5	46.4	42.2	329.1	53.6	818.7	244.5	80.7	325.8
2010	1283.7	28.4	44.3	31.3	345.2	59.1	813	248.1	80.1	325.9
2011	1101.8	30.3	43.3	38.4	340.1	56.2	864.5	266.6	93.4	315.0
10 years AVG	1139.9	24.1	36.2	23.5	267.3	44.5	594.1	194.5	55.9	264.4

Source: World Bank

To sum up, in the period 2002-2011, government health expenditure in ASEAN does not have a clear-cut trend. It just went up and down. In terms of per capita government health expenditure, if we take year 2002 and 2011 for comparison, when can see a clear increase for every country, except for the case of Brunei.

III. THEORETICAL BACKGROUND AND PREVIOUS EVIDENCES

A. Wagner's Law

Wagner's law, which is also known as "The Law of Increasing State Activity", is developed by a German economist. Wagner found a common trend of the public expenditure which increases constantly overtime. He, therefore, proposed a hypothesis, which states that as the economy grows, the activities and functions of the government also increase [4].

Wagner offered three reasons to support his hypothesis. Firstly, as nations develop, their legal relationships and communications increasing become complex resulted by the immense division of labour that increases with industrialization. Thus, state need to increase their role in terms of public, regulatory and protective activity. Moreover, increased urbanization and population density would lead to more public expenditure on law and order, and economic regulation as a result of the associated risk of more conflict in densely populated urban communities. The administrative and protective functions of the state would therefore expand. Thus, as nations become more advanced, the increase of market failures would force the state to become more regulatory in nature, thereby expanding its role and this would inevitably involve higher public expenditures.

Wagner's predictions about the increase in 'cultural and welfare' expenditures are mainly based on the presumption that as society experience higher income, they would demand more education, entertainment, a more equitable distribution of wealth and income, and generally more public services [5]. Similarly, according to [6] industrialization, urbanization and increased population density will lead to an increase in public expenditure as a share of GDP due to the increasing need for public facilities such as housing, hospitals and other infrastructure. In other words, government expands their function and activities to meet the needs of its people.

Henrekson elaborates that Wagner's contribution to public expenditure theories is significant as the prevailing view at that time was as a country grows richer, government activities would have a tendency to decline [7].

Peters examines the plausibility of Wagner's 'law' for four diverse countries [8]. The study examined data from the period 1948-1995 for the United States, from the period 1952-1995 from Thailand, from the period 1966-1995 from Barbados and from the period 1965-1995 from Haiti. The study found empirical support for Wagner's hypothesis in all these four diverse countries. According to Peters, Wagner's law may be applicable to a wider range of countries due to advancements in technology and communications.

Ramesh wrote that the argument that economic development, industrialization, modernization and urbanization are behind the emergency of statutory social security because they create a 'need' for social security, has a considerable merit as far as the ASEAN countries are concerned [9]. However, he warned that we should be careful in drawing a causal connection between industrialization, urbanization, and economic prosperity on one hand and the level of social security on the other given that it may not be true in every case. Between 1980 and 1992, Singapore was

the most developed and industrialized and the richest in the region but its social security system was not as developed as Malaysia and the Philippines.

Forson in his attempt to prove the validity of the Wagner's law and system theory which argues that government spending on social welfare depends on reasons such as the need to respond to the needs of increasing population, urbanization, tax revenue and GDP growth [6]. It is found that GDP and tax revenue are positively correlated with Thai government welfare spending and the relationship is significant. However, as for urbanization and population growth, they have positive coefficient with welfare spending but insignificant. Forson explained that as population increases, the need to provide education and health care become important but in the case of Thailand it might be that population was insignificant and the trend is rather falling. He also reasoned that as Thai government policy in general is pro-poor so less attention is given to the rich who are in the urbanized centers. Therefore, welfare spending on urbanization is low and insignificant.

B. Interest group theory

According to Garrett and Rhine It has been argued that government size and growth are determined by the demand of its citizens and these demands can either come from individual citizens or a collection of citizens organized into special interest groups. According to interest group theory, interest groups can increase the size of government by organizing members and applying political pressure more effectively than individual citizens [10]. There are of course many types of interest groups including labor unions, women associations, professional associations or business associations.

Interest groups can be defined as any organized group of individual voters or businesses having the same preference for a specific policy. Through lobbying activities, an interest group can obtain a desired policy that has direct benefits for the group but the costs of the policy must be shared by all taxpayers. Elected officials will have to weigh the political costs and benefits of each policy. Often times, supply and demand analysis are used to explain the theory. Those groups who can organize and lobby for a policy at the cost less than a certain amount are termed as "Demanders" and individual tax-payers as "Suppliers" as they would have to spend more if they want to lobby against losing that same amount of money. Elected officials will, therefore, target unorganized suppliers with low losses from any transfer while pleasing demanders who are organized and active in the political process. Due to this, costs are shared by a great number of tax-payers but the benefits are concentrated within the interest group [10].

To test the validity of interest group theory in the case of Thailand, Forson developed a model where he used labor union/association and trade union as explanatory variables for welfare spending [6]. Data from the period 1982-2007 was used. Forson found that labour union has a significant positive relationship with welfare spending, which is in support of interest group theory. This means that labour union/ association in Thailand can influence legislature through campaign contributions and lobbying for increased

welfare spending. However, he found that trade associations in Thailand have weak influence on welfare spending.

C. The neo-liberal argument versus compensation theory

There are two main schools of literatures on the relationship between globalization and welfare policies. The first school is the neo-liberal economics, which argues that globalization has forced states to cut back welfare expenditure. Their argument runs like this. Globalization has limited the policy-making choices available to governments by forcing them to prioritize international competitiveness in their fiscal and economic policies. Therefore, as market integration progresses, government welfare and tax-increase policies create inefficiencies. This is because of higher tax burden preventing manufactures in welfare states from competing effectively with their manufactures in LDCs. As a result of this, there will be capital flight from high costs countries which undoubtedly leads to higher unemployment rate. Government, therefore, has to intervene in the market by cutting tax burdens and social costs to facilitate price competitiveness of domestic producers to remain competitive.

The second school is that of compensation thesis, which holds that globalization has a positive impact on public spending [11]. It argues that the social and economic problems such as unemployment and unequal income distribution created by markets integration will put pressure on the government to expand welfare expenditure to help out those who are affected by globalization or “losers” from the globalization process.

By analyzing fourteen OECD countries, Garrett demonstrates that international market exposure leads to increased government spending on redistribution programs that compensate for market-generated inequalities [12]. The main reason is that in these countries, there exist labor-market institutions that can effectively negotiate between government and labor. Garrett argued that labor markets in these OECD countries are highly centralized and well developed which results in better coordination between government and labor on economic performance and redistribution policies [13]. In that study also confirms that globalization have increased government interventions in the economy with consistent increased government spending on social programs [13].

However, Glenn examines the impact of globalization on social welfare spending levels in the highly industrialized and industrializing states and finds that the spending patterns of these two sets of countries remain divergent [14]. In industrialized states, the state expenditure in general or welfare spending expenditure has remained stable over two decades indicating that states retain their ability to tax and spend in an era of globalization. Even though states have preferred to increase the proportion of the budget for welfare spending, they have introduced qualifying conditions to be eligible for benefits. In developing states, for many regions, general government expenditure levels were very low compared to countries in the north. Many states experienced stagnation or decline around the 1990 in states revenues for social services [15].

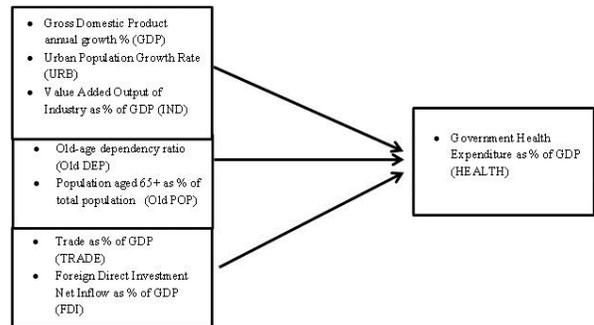
Another study by Rudra seems to show that there is indeed a difference between developed countries and less-developed

countries regarding their government social spending [16]. Rudra challenges the view that is labor in LDCs will experience both economic and political gains with globalization because with greater exposure to international markets, abundant labor should be in a better political position to demand greater government social-welfare spending. Rudra, instead proposed that globalization is likely to adversely affect government commitments to social welfare in nations that have low-skilled labor surplus because this labor will be in a weak bargaining position because of the sizeable population of low-skilled workers faces collective-action problems that are worsened by large pools of surplus labor. Based on the investigation of fifty-three LDCs from 1972-1995, Rudra found during the period from 1972 to 1995, spending in rich countries increased while it slightly declined in LDCs. This is because numbers of low-skilled workers relative to skilled workers in LDCs, coupled with large surplus-labor populations make it difficult for workers to organize so they are less capable of defending their benefits than workers in OECD countries. Therefore, when facing greater forces of globalization, social spending in these countries would not increase as would be in OECD countries.

D. Conceptual Framework

Based on the above literature review and theories about government spending and welfare expenditure, we use the variables, which we divided into three groups, as seen below to draw a conceptual framework. This section will identify the variables used and how they assume in terms of their relationship among competing variables. In this framework, the independent variables are presented on the left side and the dependent variables are presented on the right side.

Independent Variables Dependent Variables



We have seen that there are there are huge amount of literatures on social welfare expenditure but different approaches and theories have been used. In this study, to test the validity of Wagner’s law which states that economic growth, industrialization and urbanization lead to greater government expenditure which also includes the welfare expenditure, firstly, we use GDP annual growth rate and GNI per capita to measure economic growth. Secondly, we use urban population growth rate to measure urbanization, and finally, we use the value added output of industry as % of GDP to measure industrialization.

To be able to confirm or reject the argument which states that the increase in older people will lead to the increase in government social spending in the case of ASEAN, we use

old-age dependency ratio and the percentage of population aged 65 and above as independent variables. We have taken into consideration Bryant's criticism of Razinet *al* study and use the old-age dependency ratio instead of dependency ratio itself.

Considering the arguments on relationship between globalization and welfare spending put forward by neo-liberalist or by compensation theorists, we use trade as percentage of GDP and FDI net inflow to measure globalization.

Last, but not least, in order to measure welfare expenditure we use government health expenditure as percentage of GDP and per capita government expenditure on health. Due to limitation on data availability, we cannot use welfare expenditure as a whole for our analysis.

IV. RESEARCH METHODOLOGY

The design of this research is both descriptive and exploratory. It is descriptive because we are will be examine some welfare policies related to ageing in ASEAN countries and describe them. At the same time, this study is exploratory in the sense that we attempted to explore the relationship between variables that are explained in the conceptual framework. There is a huge body of empirical studies testing the relationship of these above variables but the results are sometimes conflicting and unclear. With regard to the case of ASEAN, this field of study is relatively new so we are intrigued in finding out the relationship between these variables in ASEAN countries.

A mixture of quantitative and qualitative method is utilized in this study. In particular, the multiple regression analysis is conducted as it is a statistical tool for the investigation of relationships between variables and it can ascertain the causal effect of one variable upon another. Multiple regression analysis provides an overall measure of the predictive strength of the model. It can also predict the dependent variable based on the summed contributions of the independent variables and determines the impact of each independent variable on the dependent variable.

In this study, we examine the relationship between economic growth, industrialization and urbanization, globalization and population ageing; and the size of health expenditure. We collect data and employ regression to estimate quantitative effect of the causal variables upon the variable that they influence and assess the statistical significance of the relationship.

In addition, we also investigate welfare policies and programs that closed related to ageing in ASEAN countries using qualitative method. We use government reports and NGO reports as well as scholar papers.

In this study, the independent variables comprise of GDP annual growth rate, urban population growth rate, value added output of industry as % of GDP, old-age dependency ratio, percentage of population aged 65 and above, trade as percentage of GDP and FDI inflow as percentage of GDP. The dependent variable is government expenditure on health as percentage of total GDP.

A. Data Collection and Analysis

Data from nine of ASEAN countries – BrunieDarussalem, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand and Vietnam within the period 2002-2011 have been collected from the World Bank indicators. This study is longitudinal study, more specifically, panel study as it collected data from these nine countries at different points in time. The data will be analyzed collectively using multiple regression models.

Firstly, the correlations of all variables are analyzed, both dependent and independent, to check serial correlation to solve the problem of multicollinearity that refers to a statistical situation where two or more explanatory variables in a multiple regression model are highly correlated. This means that one explanatory variable can be predicted from the others with a significant degree of accuracy. According to statistical literature, correlation among variables should be 0.8 or less because the higher they are, the more they are likely to measure the same thing. Therefore, it is recommended that we either delete those highly correlated items, or separate them into different equations.

Quantitative data for this research have been collected from secondary official sources, mainly from the World Bank. We also use the websites of some related United Nations Agencies, Help Age International, World Health Organization and the official websites or reports of governments in ASEAN region as well as the website of ASEAN.

B. Test of Multicollinearity

This table shows the correlation matrix of all variables used in this study. In order to check the serial correlation to solve the problem of multicollinearity, we have correlated all variables in a matrix. The results as shown in the above table show that only a couple of variables are highly correlated with the correlation higher than 0.8. They are the OldPOP and OldDEP that has a 0.986 correlation. As a result, we will separate OldDEP and OldPOP into different models.

TABLE II
CORRELATION MATRIX OF ALL VARIABLES

	GDP	URB	IND	OldDEP	OldPOP	FDI	TRADE	HEALTH
GDP	1							
URB	-0.27619	1						
IND	-0.49175	0.317684	1					
OldDEP	0.169555	0.06867	-0.32252	1				
OldPOP	0.086846	0.194925	-0.1999	0.986277	1			
FDI	0.346839	0.470576	-0.2861	0.549247	0.581618	1		
TRADE	0.120549	0.674901	-0.22161	0.610832	0.664169	0.804536	1	
HEALTH	-0.3372	-0.04198	0.478993	0.136047	0.200168	-0.15998	-0.01447	1

C. Model Specification

Based on the conceptual framework developed and the correlation matrix of all variables, the regression model equations will assume this form, where, ε is the error term of the model equation;

Model 1:

$$HEALTH = \beta_0 + \beta_1 GDP + \beta_2 URB + \beta_3 IND + \beta_4 Old POP + \beta_5 TRADE + \beta_6 FDI + \varepsilon$$

Model 2:

$$HEALTH = \beta_0 + \beta_1GDP + \beta_2URB + \beta_3IND + \varepsilon$$

Model 3:

$$HEALTH = \beta_0 + \beta_1Old POP + \varepsilon$$

Model 4:

$$HEALTH = \beta_0 + \beta_1TRADE + \beta_2 FDI + \varepsilon$$

V. RESULTS

In this section, we present and discuss the statistical results from the multiple regressions that we have conducted. The results of multiple regression of each model are presented using tables followed by explanation along with its implications for this study.

TABLE III
ESTIMATIONS OF THE DETERMINANTS OF HEALTH EXPENDITURE

Variable	(1)	(2)	(3)	(4)	(5)
GDP	-0.019 (0.348)	-0.036 (0.105)			
URB	-0.032** (0.000)	-0.006* (0.015)			
IND	0.015* (0.048)	0.023** (0.000)			
OLD DEP			-0.637** (0.000)		
OLD POP	1.793** (0.000)			.084** (0.000)	
TRADE	0.005 (0.000)				-0.049* (0.018)
FDI	-0.043** (0.007)				0.002 (0.067)
R ²	0.61833	0.29323	0.178255		0.062591
Adjusted-R ²	0.58575	0.26858	0.159364		0.041042
F-stat	18.978**	11.893521**	9.436114**		2.90455**

** Significant at 1 %

*Significant at 5%

A. Model 1 Estimations

In Model 1, the regression is done using all independent variables explained in previous part (GDP, URB, IND, OldDEP, OldPOP, TRADE and FDI) to understand how these variables cause change in the dependent variable that is government expenditure on health as percentage of GDP (HEALTH).

The R-square or the coefficient of determination is 0.61833 or 61.83%, meaning that about 62% of the variation in the dependent variable (Government Health Expenditure as percentage of GDP) is explained by the independent variables in Model 1 and 38% of the changes in the dependent variable is explained by other factors. The adjusted R-square, a measure of the explanatory power, is 0.58575. The adjusted R Square takes into account the sample size used. The standard error of the regression is 0.42 (percent) which is an estimate of the variation of the observed ASEAN government health expenditure, in percentage terms, about the regression line.

The model 1 has the F value close to 19, which is quite large. This means that the null hypothesis is wrong (the data are not sampled from populations with the same mean). This is actually true because ASEAN countries vary largely, for

example, in terms of their government health spending, GDP and the proportion of older people.

The results of the estimated regression line include the estimated coefficients, the standard error of the coefficients, the calculated t-statistic, the corresponding p-value, and the 95% confidence intervals. In the regression table shown above, the prediction equation is:

$$HEALTH = 4.120 - 0.019 (GDP) - 0.032 (URB) + 0.016 (IND) + 1.794 (OldPop) - 0.044 (FDI) + 0.006 (TRADE)$$

The R square for this regression is .62, showing a strong relationship between variables so we can move on with the analysis.

The plus (+) sign in the equation indicates a positive relationship between the x and the y variable whereas the minus (-) sign indicates a negative relationship. The intercept coefficient of 4.12 means when everything else is zero, it is predicted that government health expenditure to be 4.12 percent.

In summary, the independent variables used in Model 1 can explain almost 62% of changes in the dependent variable. GDP, URB, OldDEP, FDI and TRADE have a negative relationship with HEALTH whereas the OldPOP and IND have a positive relationship with HEALTH. This implies that despite there is growth in GDP, FDI inflow and trade volume, increased urbanization, and higher old age dependency ratio, ASEAN government expenditure on health will not increase but instead will decrease. On the other hand, with higher proportion of older people (population aged 65 and above) of the total population, and higher output from Industry, we can expect an increase in government health expenditure.

B. Results of Multiple regression of Model 2

In Model 2, the regression is done to prove the validity of Wagner's law, which argues that the government spending on social welfare depends on the GDP growth, increase in urbanization, and industrialization. The R square in this regression model is relatively low with just 0.29323 meaning that the independent variables used in this model can only explain 29% of the change in the dependent variable. The above table shows that GDP and URB variables are seen to be negative while IND recorded positive relationship with government health expenditure. The contribution of industrialization to government health expenditure is 0.023 percent. As in Model 1, GDP has the P value bigger than .05 meaning that the relationship between GDP and government health expenditure is likely to occur randomly.

C. Results of Multiple regression of Model 3

Model 3 regresses on government health expenditure on old-age dependency ratio and the number of population aged 65 and above. As shown under the summary output, the R square is only 0.178255, which is relatively small, meaning that only around 17.8 % of these two variables can explain the movement in government health expenditure. The significance F is 0.000195 which means that there is little chance that regression output occurred by chance. Similarly, the p-value for the two independent variables are very low so the coefficients shown in the table are not resulted from

random distribution. Again, we can see OldDEP has a negative relationship with health expenditure while the OldPop has a positive relationship. With only OldDEP and OldPop as the only two factors that cause change to HEALTH, keeping the old age dependency ratio constant, for every percent increase in older population of the total population, government health expenditure as proportion of GDP increases by 0.85 percent.

D. Results of Multiple regression of Model 4

Model 4 regresses on government health expenditure with FDI and TRADE to test the Compensation theory which states that globalization has a positive impact on public spending because government need to intervene to correct market failure. However, the R square is very low. These two variables combined can only explain 6% of the changes in government health expenditure. The significance F is relatively large compare to the other three models even though it is less than .1. This result suggests that there is higher chance than in other models that this regression result occurred by chance. The regression result shows that FDI and government health expenditure have negative relationship and the coefficient is -0.049 whereas trade and government expenditure have positive relationship with the coefficient of 0.002. However looking at the P value, we can see that FDI has a p value of 0.01, which is a good number whereas trade has a p value, which is more than .05. This suggest that trade may not be a good variable to be used for this model.

VI. CONCLUDING REMARKS

Many theories have been put forward in an attempt to explain the nature of government expenditure, particularly the welfare expenditure. A well-known theory is Wagner's Law of Increasing State Activities, which states that as the economy grows the activities and functions of the government also tend to increase. Wagner argued that economic development, industrialization and urbanization would lead to an increase in public expenditure as a share of GDP, due to the increasing need for public facilities such as housing, hospitals and other infrastructure. An investigation of the trend of the public health expenditure, which is a component of welfare expenditure in a ten-year period from 2002 to 2011 in ASEAN countries, however, does not have a constant increasing trend but a up and down trend throughout the period.

Despite there is an increase in GDP annual growth rate at least during 2002-2006, public health expenditure as proportion of GDP did not increase. From year 2009, we can see that the government health expenditure decreased by 0.1% each year. The regression result even show that health expenditure instead negatively associated with GDP growth. Similarly, despite a constant increase in urbanization throughout the whole period in ASEAN countries, health expenditure did not increase. In addition, the regression result shows the negative relationship between urbanization and health expenditure. Industrialization, however, positively associated with health expenditure.

In addition to Wagner's Law, the study also take into account the Median Voter theory which argue in order to get

more support government will have to respond to median voters. Therefore, when society is ageing, the age of median voters also increase. Thus, one view of the median voter theory holds that an increase in the number of older voters will create strong pressures for increased social spending. Population aged 65 and above as a proportion of total population in ASEAN increased from 4.9 percent to 5.7 percent. Population aged 65 and above has been more or less constantly increasing during this ten-year period. Singapore and Thailand have the highest number of population ages 65 and above reaching 9.3 percent and 9.1 percent respectively in 2011. As mentioned earlier, the health expenditure does not constantly increase. However, regression result shows that the increase in older population in ASEAN is positively associated with ASEAN government health expenditure while age-dependency ratio is negatively correlated with health expenditure. This is unexpected as these two results seem to be in conflict of each other. This may be due to the two effects ageing possesses as argued by Razil et al in one of their studies. The increase in older population has the political effect in a way that the median voter becomes old and his demand for social welfare spending will increase. At the same time, the economic effect of ageing exists where higher old-age dependency ratio puts a higher tax burden working people who will in turn disfavor high welfare expenditure.

Other theories examined in this study are the Compensation Theory and the Neo-liberal view. The Compensation theory holds that globalization has a positive impact on public spending as social and economic problems such as unemployment and unequal income distribution created by markets integration will put pressure on the government to expand welfare expenditure to help those who are affected by globalization or "losers" from the globalization process. On the other hand, the Neo-liberal view holds that globalization has forced states to cut back welfare expenditure because globalization will force government to prioritize international competitiveness in their fiscal and economic policies. Therefore, as market integration progresses, government welfare and tax-increase policies will create inefficiencies therefore; in order to prevent capital flight government has to intervene in the market by cutting tax burdens and social costs to facilitate price competitiveness of domestic producers to remain competitive.

To measure the extent of globalization in ASEAN countries, we use data on trade as proportion of GDP and FDI Net Inflow as proportion of GDP. We have seen that most countries in Southeast Asian region have opened up their economy to international trade to a very great extent. Trade as proportion of GDP in ASEAN as a whole constantly increased until 2007 where it slightly decrease and a further decrease in 2009. The regression result shows that trade is positively associated with government expenditure on health. In terms of FDI inflow, from 2002 to 2007, it increased steadily but dropped sharply in 2008 and gradually recover. Regression analysis result show that FDI inflow has negative relationship with health expenditure in ASEAN countries.

To sum up, using four different regression models, the result consistently shows that in ASEAN countries, an increasing proportion of population aged 65 and above is associated with higher government expenditure on health.

Also, more industry output as total of GDP is also positively associated with higher government expenditure on health. On the other hand, GDP, urbanization, old age dependency ratio and economic openness are all associated with lower spending on health. Some of these results are unexpected however due to the lack of previous quantitative time-series research on health spending it is unclear whether they are atypical.

Due to the lack of data on welfare expenditure of ASEAN governments, in an attempt to understand changes in the sized of welfare expenditure in these countries, we have to use changes in government health expenditure, which might in turn cause minor changes in welfare expenditure, as it is a part of it. However, it is somehow difficult to make a general conclusion about welfare expenditure in the region and the determinants of it. Cautions should be taken before making any conclusions as such. Using regression analysis result alone, we cannot really understand the push factors for the increase or decrease in government health expenditure amid population ageing. Is it the older population themselves that demand for better health care and better protection or the government themselves perceive the issue of aging as important to be addressed immediately. The current changes in demographic structure along with globalization clearly pose some challenges to ASEAN governments, especially, to maintain economic growth while making sure their populations receive social protection and welfare.

ASEAN governments have already recognized that issue of ageing in the region is important and has already been emphasized because this issue requires not only social response but have potential economic implications. ASEAN governments have set up common policy direction, for example, the ASEAN Cooperation on Social Welfare and Development, Vientiane Action Plan (2004-2010), ASEAN Socio-cultural Community Blueprint (2007), and Brunei Declaration on Strengthening Family Institution: Caring for the elderly (2010). ASEAN cooperation in the area of social welfare and development continues its effort in addressing social risks faced by children, women, the elderly and persons with disabilities (Sanusi).

On national level, some ASEAN countries have developed their policy, plan and legislations on ageing. For example, Older Persons Act B.E. 2546 (2003) and 2nd National Plan for Older Persons, 2002-2021 (Thailand); National Policy for Older Persons (1995) and National Plan of Action for Older Persons 1998 (Malaysia) and National Law on the Elderly Welfare 1998 and National Plan of Action on Ageing, 2003-2008 (Indonesia) (Sanusi).

Facing with the most ageing population in ASEAN, Singapore and Thailand has taken several steps to cope with the issue. Singapore has now shifted its approach of its public healthcare sector to focus on an ageing population and have develop plans for long term care as its population is ageing and having longer life expectancies and there are higher incidence of chronic disease. Another reason is that the informal care provided by family member for elderly member is now considered unsustainable in the long run given the declining fertility rate and more women enter the workforce. In Thailand, apart from the developing action plans, the Government provides social welfare assistance of 700 baht per month to older persons having an annual income of less

than 10,000 baht. The Government has also created an Older Persons' Fund with an initial outlay of 60 million baht. Adults who take care of their old parents have been given entitlement to tax exemptions up to a specified maximum based on their income. Other initiatives such as support to strengthen income security at old age, social activities for the elderly have also been taken by the government.

The availability of data is a major problem in doing regression analysis in this study. First, data for welfare expenditure as a whole is not available online. When data on some components of welfare expenditure available over some period in some countries, they are not available at all in some countries, thus, making it difficult for the regression analysis. Therefore, like the OECD countries, ASEAN governments should also try to create a common data set to be accessible by the public who are interested in this kind of information. This data will not only be useful to the public but also policy makers as more policy recommendations can be made following detailed and comprehensive researches.

Since this study focuses on ASEAN as a whole and only considers the health expenditure, further research needs to be conducted using the same variables used in this study on individual ASEAN countries because these member countries vary in terms of income, demographic changes, and the size of public spending.

Moreover, these pressures of ageing and globalization, it is important that ASEAN countries examine their social protection and health policies and systems carefully so that they in the right direction. The current social protection that is in place throughout ASEAN countries is very limited and coverage is limited to a small proportion of the formal sector. ASEAN governments, therefore, need to review their present systems and consider what policy changes are necessary to implement better social security protection provisions in each ASEAN country and address the limitations of their respective systems. In addressing population ageing issue, it may be difficult to come up with a common policies throughout ASEAN countries due to their differences. However, countries with fewer older persons will need to learn from other ASEAN countries that are already facing the problem of ageing and try to find the best solutions for their own country. When doing this, it is important to consider the sustainability of their programs and their short term and long term effects. Healthy and active ageing, saving for retirements, and community self-reliant programs such as Village Fund should be encouraged.

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