mrp.ase.ro

DETERMINING THE INCOME ELASTICITY OF DEMAND FOR HEALTH EXPENDITURE : AN EMPIRICAL ANALYSIS

[1]Farhana Binti MAHARUDIN, [2]Zahariah Binti Mohd ZAIN and [3]Irfah Najihah Binti Basir MALAN

[1]Faculty of Economics and Management, Universiti Putra Malaysia, 43400 Serdang, Selangor
sakuragirl@yahoo.com
[2]Faculty of Business Management, Universiti Teknologi MARA, 40450 Shah Alam, Selangor
zahar297@salam.uitm.edu.my
[3]Graduate School of Business, Universiti Teknologi MARA, 40450 Shah Alam, Selangor
irfajiha@gmail.com

Abstract
The main purpose of this study is to investigate the long-run relationship between public health care expenditure and income in Malaysia. There are many factors that affect health care expenditure positively such as income per head, population, the ageing population and national saving. The public health care is essential for economic growth and hence needs greater government involvement. The results of the unit root test indicated that all variables involved are stationary. The Johansen cointegration test can be preceded in the purpose to determine the existence of long-run relationship between variables. The precedence showed at least one cointegration vector for aggregate data models in Malaysia. Through the VECM, the aspect of goods of health care can be determined whether they are of luxury, normal or inferior levels. Different country has different health care. The results showed that Malaysia considered health care as inferior goods. Finally, there is granger causality between variables in Malaysia. Government should take steps to stabilize the economy and ensure health care is considered as normal goods. To conclude, the public health care expenditure has not only affected by the income, but also other economic variables which play significant roles towards public health care expenditure in Malaysia.

Keywords: Public health care, expenditure, income, Malaysia

1. INTRODUCTION

In the last two decades, in most countries, public health care expenditure grew significantly at a rate perceptibly higher than economic growth. But in most recent years, slow economic growth, privatization and the trend for a smaller public sector had induced the countries to seek appropriate policies which

Management Research and Practice
Volume 5 Issue 1 / March 2013
ISSN 2067- 2462

mrp.ase.ro
Management Research and Practice
Volume 5 Issue 1 / March 2013

attempt to control the increment of health care expenditure. Therefore, the government has been the major contributor in the health care market through its direct spending.

There are several factors that can affect the health care expenditure such as population. If population changes in a country, it can also cause the change in government spending. For instance, if the country's population increases, so the government spending will also increase. When the government expenditure increases, it means that the public health care expenditure decreases. Therefore, many people shift to the private health care. Does any factor affect health care expenditure in the long-run?

This study investigates how the long-run relationship occurs between income and public health care in Malaysia. Other than that, this study is also conducted to determine the stage of development which can be related with health care expenditure. Another problem is to classify the kind of goods health care is whether health care is a luxury, public (normal) or inferior goods. If the health care is inferior goods, then the government has to act in order to upgrade it to normal goods. This study intends to investigate the determinants of the health care expenditure. When the income elasticity is below one, it denotes that the health care expenditure can be depicted as income elastic and eventually it becomes necessary goods. On the other hand, if elasticity estimates is greater than one, it denotes the health care as income elastic and can be said as a luxury goods. All these features illustrate that if the elasticity is greater than one, the health care expenditure will increase faster than income. Meanwhile, if it less than one, the health cares expenditure will slightly increase slowly than income. Newhouse (1987) argues that the health care expenditure is normal goods and it can be considered as income inelastic.

2. LITERATURE REVIEW

2.1. Empirical Evidence on Health Care Expenditure and Income

According to European Journal Health Economics (2003), entitled "The Income Elasticity of Health Care Spending", the income elasticity of health expenditure can be defined as the percentage changes in health expenditure in response to given percentage changes in income. The debate over the income elasticity of public health care spending centered on the issue of using the national data and has focused on whether the elasticity is greater or less than one. Income elasticity less than one denote health care as income inelastic and therefore a 'necessary good'. On the other hand, elasticity estimates greater than one denotes health care as income elastic and therefore a 'luxury goods'. Some basic results have emerged from various studies. In the long-run, income elasticity of health expenditure

ISSN
2067- 2462

mrp.ase.ro

must be approximately one, for if it is any larger, it will take up an ever rising share of national income, and if it is lower, it will eventually disappear as an item in the nation's budget. For developed and most middle-income countries, income elasticity is often close to one or greater than one (Matteo, 2003).

Kiymaz, Akbulut and Demir (2006) examined the long-run relationship among the per capita private, public, and total health care expenditure and per capita gross domestic product and population growth of Turkey. The authors found some evidence of multivariate cointegrating relationships among the health care expenditure and gross domestic product, and population growth. The authors further found that a bivariate cointegrating relationship between private health care expenditure and per capita gross domestic product. Accordingly, a 10 percent increase in gross domestic product would translate into a 21.9 percent increase in total health care expenditure while controlling population growth. The income elasticity of health expenditure is found to be greater than 1, implying that health care is considered as a luxury good in Turkey. Finally, the authors noted that there exists one-way causality running from per capita gross domestic product to various definitions of health care expenses.

Newhouse (1987) regresses per medical expenditure on GDP per capita for 13 countries circa 1970 and finds that over 90 percent of the variance in per capita medical expenditure in these countries can be explained by variation in per capita GDP. Newhouse found the income elasticity for health care spending greater than 1 ranging 1.15 to 1.31, and concluded that medical care, by the technical definition, is luxury goods. More recently, while health care spending is normal goods, it is income inelastic. Over the period 1940-1990 in the United States, income can only account for an increase in health expenditure of 35-70 percent, while health spending overall has increased by over 700 percent. There is a strong positive relationship between per capita health spending and per capita GDP.

According to Gbesemete and Gerdthman (1992), a cross-sectional sample of 30 African countries were used in 1984 and reported that per capita GNP was the most significant factor in explaining per capita health expenditure. The health care expenditure increased proportionally more than per capita income (income elasticity above unity).

Parkin, McGuire and Yule (1987) criticized the use of aggregate data an international comparison to estimate income elasticity. The authors suggested the use of purchasing power parity rather than exchange rate conversion to deflate cross-national series on gross domestic product (GDP) and health care expenditure and concluded that health care is a necessity rather than luxury goods.

Meanwhile, Feldstein (1987) argued that the economic factors contributing to health service demand are income, price and the value of patient's time. In general, households with higher incomes had a greater

Management Research and Practice
Volume 5 Issue 1 / March 2013
ISSN
2067- 2462

expenditure for health care, although the percentage of income spent on health care declines as income increases. In other words, the income elasticity of health care expenditure was less than 1.

2.2. Determinants of Health Expenditure

International, national and regional level data was used to examine health care expenditure drivers. Many studies since the 1960s have examined the determinants of health care expenditures in an effort to explain why health expenditures have increased so much. Most of these studies have used a determinants approach in which per capita health care expenditures are regressed on variables thought to affect health expenditures. Among the determinants of per capita health expenditures have been per capita incomes, the proportion of population either over 65 or under age 15, the public finance share of health care spending, urbanization, the amount of foreign aid and the number of practicing physicians per capita. Some of the studies have also incorporated a time trend variable to serve as a simple measure of technological change. The preoccupation with income as a key expenditure driver has led to a neglect of other factors such as the effect of age distribution, technological change and even expenditure inertia.

In a study by Matteo (1998), on the key determinants of real per capita provincial government expenditures on health care over the period 1965 to 1990 are real provincial per capita income, the proportion of the provincial population over age 65 a real provincial per capita federal transfer revenues. Matteo (2005) examined the determinants of real per capita health expenditure in order to assess the impact of income, age distribution and time using American state level data for the period 1980-1998 and Canadian province-level data for the period 1975-2000. The results suggested that an ageing population drives up health expenditure. Generally, real per capita health expenditure was positively and significantly related to income, time and an ageing population.

Gbesemete and Gerdtham (1992) considered the difference in health care expenditure among 30 African countries. The author expected that six variables would be of prime importance in determining health care expenditure per capita in Africa. The three variables are percentages of birth attended by health staff, gross national product per capita and foreign aid received per capita. Out of three variables, per capita GNP was the most correlated to health care expenditure as indicated by the ratio. Specifically the results indicated that when the per capita GNP increases by 10 percent health care expenditure also rises by about 1 percent. There is a positive association between per capita GNP and health care.

Hitris and Posnett (1992), used 560 pooled time series and cross section observations from 20 OECD countries over the period 1960-1987 and found a strong and positive correlation between per capita health spending and GDP with an income elasticity of about unity. The results confirmed the importance of GDP as a determinant of health spending. The authors concluded that there is 'an income elasticity of health spending at or around unity'.

Casasnovas and Saez (2007) pointed out whether the different relationships between health care spending and the explanatory variables are country specific. In their study, they used per capita total health expenditure, per capita gross domestic product (GDP), the percentage of population 65 years and over and public health expenditure as a percentage of total health expenditure. As a result, there was a positive relationship between income and health care expenditure. There was also a considerable dispersion both between and within countries.

Kornai and Machale (2000) found that for the OECD countries, per capita health spending was strongly related to per capita income, with elasticity of about 1.5. The elasticity for developing economies was close to one. For the developed countries, the authors found that per capita health spending tends to grow at about one and a half times the growth rate of per capita income. Per capita health spending was higher in older population, but not by as much as a simple comparison of the spending of the elderly and non-elderly would suggest. Controlling for income and demographics, there does not appear to be a secular technology-driven upward drift in health spending. The public share of total health spending was significantly negatively related to per capita income and women's labor force participation, and positively related to the elderly dependency rate and urbanization rate. Together these variables explained about half the variation in observed public share. Political variables help to explain a significant part of the remaining variation. For the developing countries, per capita health spending increased at about the same rate as per capita income. In contrast to the developed countries, however, there is a more pronounced tendency for health spending to increase with the elderliness of the population. Spending also appeared to rise with the share of public health spending, a relationship that was not present in the developing country data.

3. METHODOLOGY

This study is to examine the long-run relationship between health care expenditure with income. The determinant of health care is examined by using the recently develop econometrics time series technique or data. Time series data is a set of observations on the values that a variable takes at different times. Such data may be collected at regular time intervals (example daily, weekly, monthly, quarterly and annually). But for this study, the researchers incorporated annual data.

ISSN
2067- 2462

Time series techniques namely the unit root test, cointegration test and Granger-causality test are done in the environment of Vector Error Correction Model (VECM). Testing for cointegration will determine whether an equilibrium relationship exists between four independent variables P_t (Population), GDP_t (Real Gross Domestic Product), NS_t (National saving), and AGE_t (Ratio of the population aged 65 years) with dependent variable H_t (Public Health Care Expenditure) in the long-run. If the test results show that variables are cointegrated, then it can be concluded that these variables are moving together at least in the long run. The results of VECM will indicate the kinds of goods health care expenditure pays for, that is, inferior, normal and luxury goods.

o estimate the kind of health care expenditure, it is important to look at the coefficient in the VECM test and assume that when the health care expenditure is more than 1 the health care is a luxury goods. To determine the health care is normal goods the value of coefficient must be positive and less than 1. Finally, if the health care is negative value so the health care is inferior goods. As a result:

If $E = 1 \longrightarrow$ health expenditure is increasing at the same rate as GDP.

If $E < 1 \longrightarrow$ health expenditure is increasing at a lower than GDP, which means the public health sector is not high priority among the goals for social and economic development.

If $E > 1 \longrightarrow$ health expenditure is increasing at a rate higher than GDP, this means that the public health sector has been given high priority.

The public health expenditure function can be written as follows:

$$H_t = f\,(P_t, RGDP_t, NS_t, AGE_t) \qquad \text{........................ (1)}$$

where:

H_t	=	Per capita Public Health Care Expenditure
P_t	=	Population
$RGDP_t$	=	Real Gross Domestic Product
NS_t	=	National saving
AGE_t	=	Ratio of the population aged 65 years

Using natural logarithm form for function (2), will allow us to get long-run relationship between health care expenditure and income with respect to per capita public health care expenditure, population, Gross Domestic Product (GDP), national saving and ratio of the population aged 65 years above. The equation to be estimated is as follows:

$H_t = \beta_1 + \beta_2 P_t + \beta_3 RGDP_t + \beta_4 NS_t + \beta_5 AGE_t + \mu_t$ ………………...(2)

Note that H_t, P_t, $RGDP_t$, NS_t and AGE_t are earlier defined.

3.1. Unit Root Test

Unit root test has been used to test whether these variables are stationary or not. A unit root test is a statistical test for the proposition that in an autoregressive statistical model of a time series, the autoregressive parameter is one. The empirical analysis of this study will begin with the investigation of the unit root property of the four variables that was proposed in the previous section. It is crucial to identify the unit root properly before performing further estimation in order to avoid the problem of spurious regression. In this study, the unit root test that will be employed is the Augmented Dickey Fuller (ADF) test by Dickey and Fuller (1979). This testing principle was utilized by previous researchers such as Owoye (1995), Green, Holmes and Kowalski (2001), Ugo and Qing (2002), Narayan (2005) as well as Narayan and Narayan (2006).

The static test or well known as unit root test is the best and efficient way to ensure the static data test. This is because it can avoid fake regression estimation that exists in the test. Indirectly, the result for the test will fail when it ends. The static data can be referred by using the value of confident level and also the Durbin Watson (DW) value. If the coefficient value of confident level is higher than DW value, the data is not static. So, in order to make estimation, the static coefficient is needed at first. When it is not static, it shows that the min value, variance and time series data covariance is not fixed and also has the *'trend'* characteristics. Any variables have the possibility to stay static in level shape, first differentiation or second level differentiation. If the variable is static after being differentiation at once, that means it has one integration or *I(1)*. Otherwise, if the variable has been differentiated at *'n'* times to become static, that shows it has the *'n'* or *I(n).*

This study also uses the Augmented Dickey-Fuller test or also known as ADF and the Philip-Perron or also famous with PP test in order to observe the real position static data test, so that there will be no linger fake estimation. The ADF Unit Root test is assuming that uncorrelated interference factor and has constant variance. In this case, both tests are used to measure the static for variable a used ADF method based on regression model.

ISSN
2067- 2462

MANAGEMENT RESEARCH AND PRACTICE Vol. 5 Issue 1 (2013) pp: 14-36

Unit root tests can be used to determine if trending data should be first differentiated or regressed on deterministic functions of time to render the data stationary. Moreover, economic theory often suggests the existence of long-run equilibrium relationships among non-stationary time series variables. If these variables are *I(1)*, then cointegration techniques can be used to model these long-run relations. For a time series, test for unit root test is based on the following equation. The ADF unit root test is based on the *t* ratio of the parameter and can be expressed as follows:

$$\Delta H_t = \beta_1 + \beta_2 H_{t-1} + \beta_3 \sigma_t + \beta_4 \sum_{t-1}^{n} \Delta H_{t-1} + \varepsilon_t \qquad \text{..................(3a)}$$

$$\Delta P_t = \beta_1 + \beta_2 P_{t-1} + \beta_3 \sigma_t + \beta_4 \sum_{-1}^{n} \Delta P_{t-1} + \varepsilon_t \qquad \text{..................(3b)}$$

$$\Delta RGDP_t = \beta_1 + \beta_2 RGDP_{t-1} + \beta_3 \sigma_t + \beta_4 \sum_{t-1}^{n} \Delta RGDP_{t-1} + \varepsilon_t \qquad \text{..................(3c)}$$

$$\Delta NS_t = \beta_1 + \beta_2 NS_{t-1} + \beta_3 \sigma_t + \beta_4 \sum_{t-1}^{n} \Delta NS_{t-1} + \varepsilon_t \qquad \text{..................(3d)}$$

$$\Delta AGE_t = \beta_1 + \beta_2 AGE_{t-1} + \beta_3 \sigma_t + \beta_4 \sum_{t-1}^{n} \Delta AGE_{t-1} + \varepsilon_t \qquad \text{..................(3e)}$$

where:

- ***Δ*** = first differencing operator
- ***t*** = time trend
- ***n*** = number of lagged term
- ***ε*** = stationary random error

n should be large enough to ensure that ε_t is stationary random error (white noise)

ISSN
2067- 2462

According to the equation above (3), changes in every variable are first differentiating for time trend. However, ε_t is white noise disturbance terms, *t* is time trend or trend variables and *n* is the number of lagged terms. In that equation, the number of lagged terms *n* is chosen to ensure the errors are uncorrelated. The optimal lag length *n* may be selected by using Akaike information criteria. The lag order of criteria for the ADF regression is set automatically on EVIEWS package.

For example, the null and alternative hypotheses under the ADF test are as follows:

H_o : H_t is I (1)

H_1 : H_t is not I (1)

The null hypothesis will be rejected if β_1 is found to be negative and significantly different from zero. The ADF tests for temporally dependent and heterogeneously distributed errors by including lagged innovation sequence in the fitted regression. The critical values for ADF test are given in MacKinnon (1996).

Unlike ADF test, making assumption that disturbance factor is uncorrelated and has constant variance, the PP test seems to be better than it. This is simply because the PP test includes the unpredicted problems that will occur in the disturbance factor especially if variances value is not constant. It starts when it makes assumption on these equations as stated follows:

$$\Delta X_t = \mu_1 + \alpha_1 X_{t-1} + \varepsilon_t \quad \text{.................................. (4a)}$$

$$\Delta X_t = \mu_1 + \alpha_1 X_{t-1} + \alpha_2 \psi + \varepsilon_t \quad \text{................................ (4b)}$$

Where, ΔX_t represents the first series of differentiation for X_t while ψ shows the time trend. From (5a), t-static value and Z ($\tau_{\alpha,\mu}$) must be in negative value at different significant level to create a constant X_t. While in (5b) t-static value and Z ($\tau_{\alpha,\mu}$) must be in negative value and the significant level is different than zero value. Hence, it proves that PP statistic test has been modified from ADF test.

3.2. Cointegration Test: Long-Run Relationship

In order to test cointegration for multiple variables, Johansen-Juselius procedure developed by Johansen and Juselius (1990) will be conducted. If there is at least one cointegrating vector, it indicates that there is long-run relationship exists among the tested variable. In other words, the existence of long-run equilibrium relationship among the tested variable is referred as cointegration (Chang and Yuan Hong, 2002).

Management Research and Practice
Volume 5 Issue 1 / March 2013
ISSN
2067- 2462

MANAGEMENT RESEARCH AND PRACTICE Vol. 5 Issue 1 (2013) pp: 14-36

The concept of cointegrating can be applied to a wide variety of the economics models. The general concept of cointegration is that there exists a long-run relationship between a set of time series variables, provided that the series are integrated to the same other. Series that are cointegrated move together in the long- run at the same rate. In other words, they obey an equilibrium relationship in the long- run (Davidson and MacKinnon 1993). The fundamental idea of cointegration which was developed by Eagle and Granger (1987) has several important implications that go beyond its use as a diagnostic for linear regression. Firstly, the cointegration regression measures the long-run relationships between variables. Secondly, cointegration rules out the methods should be conducted in order to modeling any dynamic relationship.

Cointegration deals with the relationships among a group of variables, where unconditionally each has a unit root. Therefore, it can be interpreted that the long-run paths of these variables are interdependent. The Johansen method applies the maximum likelihood to determine the presence of cointegrating vectors in non-stationary time series. The trace test and Eigenvalue test determine the number of cointegrating vectors. This implies a stationary long-run equilibrium relationship between the variables.

3.3. Johansen Multivariate Cointegration Test

In this analysis, the maximum likelihood cointegration test is due to Johansen (1988) and Johansen and Juselius (1990), which are utilized to test for the number of linearity independent cointegrating vectors in the system. The procedure provides more robust result than other methods when there are more than two variables (Gonzalo, 1994). The Johansen-Juselius test is important to examine whether there is long-run equilibrium between the macroeconomics variable. The cointegration test consists of two steps:

a) to determine the order of integration of the individual series. A series Yt is said to be integrated of order d times and is denoted as Yt ~ I(d).

b) to test whether the linear combination of the series that becomes stationary after first difference are cointegrated only variables of the same order of integration may constitute a cointegration relationship.

The Johansen Cointegration test is an effective method to see the relation between dependent variable and independent variable closely in a time series regression analysis. Cointegration refers to a linear combination for a variable which is not static. The cointegration measurement includes two types which are trace test and Maximum Eigenvalue test. Both tests are used to determine the significance of the number of characteristic roots that are not different from unity. Both tests are expressed as follows:

3.4. Trace Test

$\lambda trace\ (r) = -T\Sigma\ \ln\ (1-\lambda 1)$ ………… (5)

3.5. Maximum Eigenvalue Test

$\lambda max\ (r, r+1) = -T\Sigma\ \ln\ (1-\lambda 1+1)$ ………… (6)

Where λi is the estimated values of the characteristic roots obtained from the estimated Π matrix, r is the number of cointegrating vectors, and T is the number of observations. The critical values for these tests are tabulated in Johansen and Juselius and Osterwald-Lenum.

3.6. Vector Error Correction Model (VECM)

Data which has got long-run relationship, VECM is used to test for short-run relationship. The vector error correction models (VECM) specify the short-run dynamics of each variable in the system, and in a framework that anchors the dynamics to long-run equilibrium relationships suggested by economic theory. The existence of such long-run conditions does not prevent the existence of stationary, though variable, short-run deviations from them. Phillips (1998) showed that forecasts based on a vector error correction model that explicitly estimates co-integrating relationships (if any) and unit roots are consistent and asymptotically optimal. Empirically, the literature on forecasting tends to support the superiority of the VECMs for longer-horizon forecasting, although this advantage does not seem clear for shorter horizons.

Testing causality in the Vector Error Correction Model (VECM) framework is presently at the very forefront of econometric research (Toda and Philips, 1993). The underpinnings of this approach (Engle and Granger, 1987), who demonstrated that once a number of variables (x1 and y1) are found to be cointegrated. Engle and Granger (1987) show that in the presence of cointegration, there are always exists a corresponding error-correction representation. This implies that changes in the dependent variable are a function of the level of disequilibrium in the cointegrating relationship (captured by the error-correction term), as well as changes in other explanatory variables.

ISSN
2067- 2462

mrp.ase.ro
Management Research and Practice
Volume 5 Issue 1 / March 2013

3.7. Granger – Causality Test

Granger Causality is a technique for determining whether one time series is useful for casting another. Ordinarily, regressions reflect mere correlations, but Clive Granger, who won a Nobel Prize, argued that there is an interpretation of a set of tests as revealing something about causality. Granger (1969) points out that if there is existence of cointegrating vector among the variables, thus, there variable must be causality among these variables at least in one direction.

However, a correlation among each variable is a subjective result and it cannot analyze the real relationship between the test variables. Hence, the best way to see that kind of relation is by referring the cause direction, using the Granger Causality test as follows:

$$Ht = \delta + \sum_{i=1}^{a} \beta i\, Ht\text{-}i + \sum_{j=1}^{b} \beta j\, \varphi t\text{-}j + \mu t \qquad \text{..................(7a)}$$

$$Pt = \delta + \sum_{i=1}^{a} \beta i\, Pt\text{-}i + \sum_{j=1}^{b} \beta j\, \eta t\text{-}j + \mu t \qquad \text{..................(7b)}$$

$$RGDPt = \delta + \sum_{i=1}^{a} \beta i\, RGDPt\text{-}i + \sum_{j=1}^{b} \beta j\, \zeta t\text{-}j + \mu t \qquad \text{... .... (7c)}$$

$$NSt = \delta + \sum_{i=1}^{a} \beta i\, NSt\text{-}i + \sum_{j=1}^{b} \beta j\, ςt\text{-}j + \mu t \qquad \text{..................(7d)}$$

$$AGEt = \delta + \sum_{i=1}^{a} \beta i\, AGEt\text{-}i + \sum_{j=1}^{b} \beta j\, \delta t\text{-}j + \mu t \qquad \text{..................(7e)}$$

ISSN
2067- 2462

mrp.ase.ro
Management Research and Practice
Volume 5 Issue 1 / March 2013

Where δ is a constant variable in (7a) till (7e) equation. Meanwhile, βi and βj in the equations represent estimation coefficient. However, μ represents the disturbance term which is uncorrelated with the zero 'mean' value and also the limited co-variance. Granger Causality test hypothesis is as follows:

Hypothesis I

$H0 : \alpha 1 = \alpha 2 = \alpha 3 = \alpha 4 = \alpha 5 = 0$

$H1 : \alpha 1 = \alpha 2 = \alpha 3 = \alpha 4 = \alpha 5 \neq 0$

Hypothesis II

$H0 : \lambda 1 = \lambda 2 = \lambda 3 = \lambda 4 = \lambda 5 = 0$

$H1 : \lambda 1 = \lambda 2 = \lambda 3 = \lambda 4 = \lambda 5 \neq 0$

Null hypothesis (H0) is accepted based on F-statistic result and it encourages the direction refusing of Granger Causality. Otherwise, if (H0) has been refused for both equations by F-statistic, hence one way relationship of Granger Causality will exist. Inverse relationship will only exist if the causality happens in two directions. For example, real gross domestic product (RGDPt) gives an implication towards public health care expenditure per capita (Ht) and at the same time public health care expenditure per capita (Ht) also give an impact towards real gross domestic product (RGDPt).

4. FINDINGS

4.1. Background Analysis (Cross Tabulation)

Table 4.1 shows the cross tabulation among people between aged 65 above and health care expenditure in Malaysia. The column shows the health care expenditure in millions of Ringgit where its highest expenditure is less than RM 1200 millions with the value percentage is 44.44 percent. From the total of health expenditure, the highest health care expenditure is at 401-500 in thousand among people in aged 65 above with its percentage, 19.44 percent. While with the percentage 13.89 percent, the second highest health care expenditure is at 501-600 in thousand among people in aged 65 above and the third highest spending in health care is at 301-400 aged 65 above people in thousand which account for 8.33 percent. At the same time, the lowest of the health care expenditure are at the range of RM 1801-RM 2400, RM 3001-RM 3600 and RM 4201-RM 4800 millions which account for 2.78 percent.

Meanwhile, the row in cross tabulation shows people at 65 aged above in thousand. From the Table 4.1, the highest people spend their money which is less than RM 1200 millions for health care is

ISSN
2067- 2462

MANAGEMENT RESEARCH AND PRACTICE Vol. 5 Issue 1 (2013) pp: 14-36

between 401 until 501 people with the percentage 19.44 percent. It reveals this group of people at aged 65 above in Malaysia, and they always aware of a good care of their health in order to have a prosperity life. In spite of this, they can contribute an increase in economy especially in the agriculture sector. Besides, with the percentage 2.78 percent, there are two groups who spend the lowest money on health care. They are the group with the average 200-300 aged 65 above people in thousand with their spending less than RM 1200 millions. Another group is with the average 1101-1200 aged 65 above people in thousand with their spending more than RM 4801 millions. As the conclusion, the increase of citizen population is in accordance with the government's expenditure on health care.

Aged 65 Above (Thousand)	Health Care Expenditure (Millions of Ringgit) <1200	1201-1800	1801-2400	2401-3000	3001-3600	3601-4200	4201-4800	>4801	TOTAL
200-300	1 (2.78)								1 (2.78)
301-400	3 (8.33)								3 (8.33)
401-500	7 (19.44)								7 (19.44)
501-600	5 (13.89)	1 (2.78)							6 (16.67)
601-700		4 (11.11)	1 (2.78)	1 (2.78)					6 (16.67)
701-800				3 (8.33)	1 (2.78)				4 (11.11)
801-900						2 (5.56)	1 (2.78)		3 (8.33)
901-1000								3 (8.33)	3 (8.33)
1001-1100								2 (5.56)	2 (5.56)
1101-1200								1 (2.78)	1 (2.78)
TOTAL	16 (44.44)	5 (13.89)	1 (2.78)	4 (11.11)	1 (2.78)	2 (5.56)	1 (2.78)	6 (16.67)	36 (100)

TABLE 4.1 - CROSS TABULATION BETWEEN AGED 65 ABOVED AND HEALTH CARE EXPENDITURE IN MALAYSIA

(NOTE: Value in parentheses measured by percentage)

Table 4.2 explains the cross tabulation between population and national saving in Malaysia. The column shows national saving in million of Ringgits. Meanwhile, the row represents population in millions. From the table, the highest total of national saving is between RM 10001-RM 40000 million with its percentage 36.11 percent. Among this total, the highest national saving is at the population 14001-16000 millions which is 13.89 percent, while the second highest is at the population 16001-18000 millions which is 11.11 percent. With the percentage 5.56 percent, two groups of population which is at

Management Research and Practice

Volume 5 Issue 1 / March 2013

ISSN 2067- 2462

the average 12001-14000 millions and 18001-20000 millions have their lowest national saving. Despite that, the lowest total of national saving is at the average of more than RM 160001 millions with 5.56 percent. From this total, the national saving is at the population 22001-24000 millions and 24001-26000 millions with the percentage 2.78 percent. The table 4.2 also shows the highest total of population in order to obtain the national saving at the average 120001-14000 millions with its percentage 19.44 percent. From overall total, the highest national saving is less than RM 10000 millions with 13.89 percent meanwhile the lowest national saving is between RM 10001-RM 40000 millions with 5.56 percent. In spite of this, the lowest total of population to achieve the national saving is at the average more than 26001 million with 2.78 percent and its saving is more than RM 160001 with the same percentage. Thus, if there are more citizens, the more national saving can be obtained by the government in order to increase the investment in the economy. This way can help to tighten up the bond between population and national saving in a positive manner.

TABLE 4.2 - CROSS TABULATION BETWEEN POPULATION AND NATIONAL SAVING IN MALAYSIA

Population (Millions)	National Saving (Millions of Ringgit) <10000	10001-40000	40001-80000	80001-120000	120001-160000	>160001	TOTAL
10001-12000	4 (11.11)						4 (11.11)
12001-14000	5 (13.89)	2 (5.56)					7 (19.44)
14001-16000		5 (13.89)					5 (13.89)
16001-18000		4 (11.11)					4 (11.11)
18001-20000		2 (5.56)	3 (8.33)				5 (13.89)
20001-22000			1 (2.78)	2 (5.56)	1 (2.78)		4 (11.11)
22001-24000					2 (5.56)		2 (5.56)
24001-26000				1 (2.78)	2 (5.56)	1 (2.78)	4 (11.11)
>26001						1 (2.78)	1 (2.78)
TOTAL	9 (25.00)	13 (36.11)	4 (11.11)	3 (8.33)	5 (13.89)	2 (5.56)	36 (100)

(NOTE: Value in parentheses measure by percentage)

4.2. Unit Root Test Results

Two different unit root tests are conducted to ensure the robustness of the results in determining the univariate properties of the data. The ADF and PP unit root tests results are presented in Table 4.3. The optimal lag lengths for the ADF test were chosen based on the Akaike Information Criterion (AIC), while

Management Research and Practice
Volume 5 Issue 1 / March 2013
ISSN
2067- 2462

MANAGEMENT RESEARCH AND PRACTICE Vol. 5 Issue 1 (2013) pp: 14-36

for the PP test, it is based on the automatic selection procedure of Newey-West Bandwidth (1994) for Bartlett Kernel. The results of unit root test for Malaysia are represented in the Table 4.3 which reports the Augmented Dickey Fuller (ADF) and Philip-Perron test of stationary were used in the levels and first differences of series. The ADF and PP are done by including intercept and trend and intercept variables in the regression. This study used the lag length 2. Initially, the transformed value of the variable presented into the log before analysis. Based on the results for Malaysia, in the levels form, results show that the null hypothesis of the existence of a unit root cannot be rejected at the conventional significance levels because the value of test statistics is less than absolute critical values.

Variable	Dickey Fuller/Augmented Dickey Fuller (DF/ADF) Unit Root Test		Phillips-Perron (PP) Unit Root Test	
Level – I(0)	**Intercept**	**Trend and Intercept**	**Intercept**	**Trend and Intercept**
LH	-1.3364	-2.9473	-1.3849	-2.9473
LPOP	-0.0675	-3.0798	-0.0081	-2.4294
LRGDP	0.8501	-1.7342	1.0305	-1.1428
LNS	-1.7532	-3.0895	-3.6151	-3.0863
LAGE	1.7505	-0.2344	0.6066	-1.0882
1st Difference - I(1)	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LH	-5.9605***	-5.9801***	-6.0231***	-5.9528***
LPOP	-4.3815***	-4.3091***	-4.2134***	-4.1247**
LRGDP	-3.9242***	-3.9801**	-3.9930***	-3.9202**
LNS	-6.3541***	-6.6905***	-8.8572***	-18.0984***
LAGE	-4.4280***	-4.7596***	-4.4609***	-4.7596***

TABLE 4.3 - RESULTS OF UNIT ROOT TESTS FOR MALAYSIA
(Note: ***, ** and * denote as significant at 1%, 5% and 10% respectively)

The study indicates that there are six variables namely, Ht (Health Care Expenditure), Pt (Population), RGDPt (Real Gross Domestic Product), NSt (National saving), and AGEt (Ratio of the population aged 65 years) for Malaysia are non stationary at their levels. Nevertheless, both tests clearly show that all data are stationary in their first differences, indicating that they are I(1) processes. It is stationary after ADF and PP is applied at the first differences levels in all variables series and the result is stationary at 1 percent and 5 percent respectively significance levels. Since all the series are stationary or integrated of order one I(1), thus it allows the study to be conducted further with Co-integration tests.

mrp.ase.ro
Management Research and Practice
Volume 5 Issue 1 / March 2013

4.3. Cointegration Test Result

Once the order of integration of each time series is determined, the next step is to test for the cointegration relationship among the variables in the model. The Johansen maximum likelihood method from Johansen and Juselius (1990) is utilized to examine the number of cointegrating vector(s) in the model. The cointegration test was conducted to investigate the long-run relationship between variable which include Ht (Health Care Expenditure), Pt (Population), GDPt (Real Gross Domestic Product), NSt (National saving), and AGEt (Ratio of the population aged 65 years). The outcomes of cointegration test for Malaysia are represented in Table 4.4, which shows both the result of the maximum-eigenvalue and trace statistic. The results indicate the existence of at one cointegrating vector in maximum-eigenvalue and trace statistic. At the maximum-eigenvalue, the null of non cointegration is rejected at 5 percent level. However, the null hypothesis at most one cointegrating vector cannot be rejected. This implies that there is a single cointegrating vector in the model, and consequently there is a long-run stable linear equilibrium relationship among the variables in the system. Meanwhile, looking at the results of trace statistic test supports and indicates one co-integrating vector in the health care expenditure.

TABLE 4.4 - JOHANSEN COINTEGRATION TEST FOR MALAYSIA

		TEST		
Null	Max-Eigen Statistic	5% Critical Value	Trace Statistic	1% Critical Value
$H_0 : r = 0$	38.3406*	33.46	90.0051**	76.07
$H_0 : r \leq 1$	24.6608	27.07	51.6646	54.46
$H_0 : r \leq 2$	19.9665	20.97	27.0037	35.65
$H_0 : r \leq 3$	6.8736	14.07	7.0372	20.04
$H_0 : r \leq 4$	0.1637	3.76	0.1637	6.65

Notes: r indicates the number of co-integrating vectors. *(**) denotes rejection of the hypothesis at the 5%(1%) level.

4.4. Vector Error Correction and Granger Test Results

There is a long-run stable relationship between variable that are Ht (Health Care Expenditure), Pt (Population), GDPt (Real Gross Domestic Product), NSt (National saving), and AGEt (Ratio of the population aged 65 years). An equation can be formed to further identify the relationship between between public health care expenditure and income in Malaysia. The formation of the equation is based on the vector error correlation estimate where all the values are the normalized coefficients for the dependent variable in the model. The equations are as follows:

$$Ht = 64.4324 - 7.2729\ Pt - 3.4299\ RGDPt + 1.0130\ NSt + 2.9092\ AGEt \quad \ldots\ldots \quad (1)$$
$$(-5.2977) \qquad (-8.4187) \qquad (6.8066) \qquad (2.7142)$$

ISSN
2067- 2462

MANAGEMENT RESEARCH AND PRACTICE Vol. 5 Issue 1 (2013) pp: 14-36

The equation (1) is based on the vector error correlation estimates for Malaysia. The figure in parentheses is t-statistic. Based on equation (1), there is a negative relationship between health care expenditure and population in the long-run. From that equation, when population increase and health care expenditure decrease because people change from public health care to private health care. The estimated equation shows that a 1 percent increase in population will decrease in health care expenditure with value -7.27 percent. The equation shows negative relationship between health care expenditure and real gross domestic product. It means that when real gross domestic product increase and health care expenditure decrease because at that time health care is an inferior good. Meanwhile, referring to equation there is a significant positive relationship between health care expenditure and national saving. Since the government revenue increase, it means that national saving also increase and lead the health care expenditure also increase. The estimated coefficient indicates that 1 percent increase in national saving will contribute to approximately 1.013 percent increase in the health care expenditure which is almost one to one ratio. Lastly, the equation reveals there is significant positive relationship between population age 65 above with health care expenditure. It is because when population aged 65 above increases and health care expenditure also increases, it shows people at the aged take care of their health. If more people at aged 65 above require a high demand of health care so the health care expenditure will increase.

TABLE 4.5: THE GRANGER CAUSALITY AND VECM RESULTS FOR MALAYSIA

	Short-Run Lagged Difference (Chi-Square)					VECM (t-statistics)
Dependent Variable	**Δ LH**	**Δ LPOP**	**Δ LRGDP**	**Δ LNS**	**Δ LAGE**	**ECT_{t-1}**
Δ LH	-	0.749604 (0.6874)	3.375855 (0.1849)	2.721024 (0.2565)	1.897517 (0.3872)	0.203735 (1.11662)
Δ LPOP	1.263292 (0.5317)	-	2.951543 (0.2286)	2.419832 (0.2982)	7.584395 (0.0225)	0.024079 (1.82103)
Δ LRGDP	2.576003 (0.2758)	6.035074 (0.0489)	-	1.010207 (0.6034)	3.657248 (0.1606)	-0.185026 (-2.76134)
Δ LNS	0.635948 (0.7276)	4.948863 (0.0842)	5.996966 (0.0499)	-	5.309135 (0.0703)	-0.102094 (-0.27688)
Δ LAGE	1.549112 (0.1764)	3.469938 (0.1764)	1.538766 (0.4633)	0.885407 (0.6423)	_	-0.055373 (-4.03872)

Notes: ECTt-1 is the Error Correction Term

mrp.ase.ro

Since the variables are cointegrated in the model, so the Granger Causality test was conducted in the VECM framework. The results of Granger Causality based on VECM for Malaysia reported in Table 4.5. First and foremost, when apply health care expenditure as a dependent variable there are all variable affect the Granger Causality.

So, the population, real gross domestic product, national saving and population by aged 65 above will affect the health care expenditure whether increase or not. In the third column, when the population regard as a dependent variable, all variables show Granger Causality towards one another except real gross domestic product and national saving cannot effect the population. Meanwhile, national saving as a dependent variable, there are all variables indicate Granger Causality towards one another.

Finally, when population aged 65 above as a dependent variable, there are only two variables show the Granger Causality between that variable except population and national saving. Both of the variables cannot indicate the Granger Causality.

Based on ECT column under VECM (t-statistics), it shows the long-run causality which is any changes in the dependent variables that leads to widening or narrowing between dependent variables.

To estimate the kind of health care, coefficient in the VECM test will be referred.

For Malaysia, the health care is inferior goods because the value in coefficient is negative which indicates -3.4299. It is due to real gross domestic product (RGDP) increases, whereby health care expenditure decreases. Therefore, the Malaysian government must improve their services in health care to obtain normal goods. Even though public health care is considered cheap and has complete facility, the public health care is still considered as inferior goods because in Malaysia income is not significant with health care which value 1.1166.

It means that there is no difference in income of population in which every person normally gets average income based on their level of study. Ultimately, as Malaysia's economy strengthens, the health care market will increase.

The government actually increased the allocation for public health and medical services. It means government's new efforts are to streamline and improve the delivery of healthcare services to obtain health care which is normal goods.

ISSN
2067- 2462

4.5. Causality Results

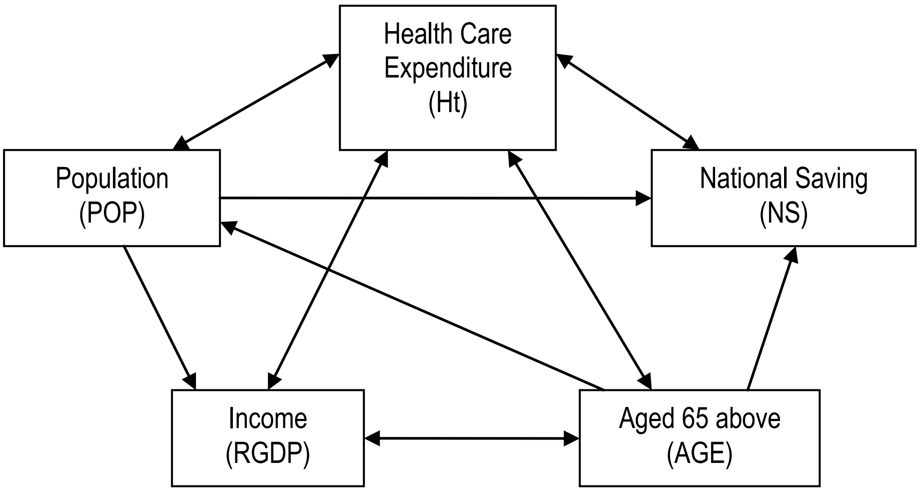

FIG. - 4.1. SUMMARY OF CAUSALITY RESULT FOR MALAYSIA.

Fig. 4.1 shows a summary of causality result for Malaysia. All variables imply changes in health care expenditure. If health care expenditure changes, so population, income, national saving and population aged 65 above also change. While, the changes in these variables also influence changes in health care expenditure, so if health care expenditure increases, it leads to an increase in all variables. It can be seen that health care expenditure is very important in an economy. Then, if population changes, health care expenditure, income, national saving also change except population aged 65 above. Meanwhile, if income as a dependent, it changes in health care, population and aged 65 above. For example, increasing in income, so the government can spend more in health care, hence it will also increase in population and population aged 65 above. Besides that, if population aged 65 above as a dependent and it changes, there are changes in all variables. Lastly, changes in national saving will lead to changes in four variables.

6. CONCLUSIONS

The main objective of this paper is to investigate the long-run relationship between health care expenditure and income in Malaysia. In time series analysis, a stationary test usually is the first step. The stationary time series that are controlled by an Augmented Dickey Fuller (ADF) and Philip Perron (PP) test indicates that the most variables are non stationary in levels. The similar steps of unit root test are repeated on the first difference of the series. The results confirmed that all variables are stationary at the first differences. Then, if the results for unit root test were stationary in the same order, the second step will be preceding which is the Johansen cointegration test.

The cointegration test employs to determine the existence of long-run relationship between variables. Clearly, the Johansen test concluded the existence of at least one co-integration vector for Malaysia. These results suggested that health care expenditure variables are co-integrated with either of the variables. It has appeared that health care expenditure and other variables move together in the long-run. Then, vector error correction method (VECM) is used to identify the effect between health care expenditure and income in the short-run. From this test, the kind of goods health care expenditure is found. Health care expenditure is an inferior goods in Malaysia. It is because when gross domestic product increases, health care expenditure decreases. Lastly, the Granger Causality test is used to determine whether one time series is useful in forecasting between another. The results found that all variables namely population, population aged 65 above and national saving will lead to effect health care expenditure. So, this research proves that in the long-run, there is a relationship between health care expenditure and income. Other variables also influence health care expenditure in the long-run.

In conclusion, it is recommended that Malaysia should invest in health care because it gives benefit and improve the effectiveness and efficiency of the health system for all nation and also the ability to contribute towards achieving better health for the growing population and also to increase the economy. For future research, other variables should be considered into the model to estimate that other factors could be affected in health care expenditure in the long-run. Future research should focus into both the demand and supply side of public health care. Hence, this study serves to be as a preliminary study which motivates researchers to explore further issues related to public and private health care especially in Malaysia.

REFERENCES

Barros P.P., "The blackbox of health care expenditure determinants," *Health Economics,* vol. 7, pp.555-554, 1998.

Casasnovas L.G.and Saez M., "A multilevel analysis on the determinants of regional health care expenditure: A note," *European Journal of Health Economics,* vol. 8, pp. 59-65, 2007.

Chang T. and Yuan Hong H., "Tax or spend? What causes what: Taiwan's Evidence," *International Journal of Business and Economics* (forthcoming), 2002.

Choksi A.M. (March 2003). The changing face of healthcare in emerging markets. *Financing Health Care Project.* [Online]. Available: http://www.rubcap.com

Davidson R. and MacKinnon J.G., "Estimation and inference in econometrics," Oxford University Press, 1993.

Dickey D.A. and Fuller W.A., "Distribution of the estimators for autoregressive time series with a unit root," *Journal of the American Statistical Association,* vol. 74, pp. 427-431, 1979.

Management Research and Practice
Volume 5 Issue 1 / March 2013
ISSN
2067- 2462

Eagle R. and Granger C., "Cointegration and error correction: Representation, estimation and testing," *Econometrica,* vol. 55, pp. 251-276, 1987.

Feldstein P.J., *Health care economics,* New York: Wiley, 1979.

Feldstein M., "Should social security benefits increase with age?," *NBER Working Papers 2200,* National Bureau of Economic Research, Inc., 1987.

Gonzalo J., "Five alternative methods of estimating long-run equilibrium relationships," *Journal of Econometrics,* vol. 60, pp. 203-233, 1994.

Granger C.W.J., "Investigating causal relation by econometric and cross-sectional method," *Econometrica,* vol. 37, pp. 424-438, 1969.

Green C.J., Holmes M.J., and Kowalski T., "Poland: A successful transition to budget sustainability?," *Emerging Market Review,* vol. 2, pp. 160-182, 2001.

Matteo L. and Matteo R., "Evidence on the determinants of Canadian provincial government health expenditures: 1965-1991," *Journal of Health Economics,* vol. 17, pp. 209-227, 1998.

Gbesemete K.P. and Gerdtham U.G., "Determinants of health care expenditure in Africa: A cross-sectional study," *World Development,* vol. 20, pp. 303-308, 1992.

Gerdtham U.G., Sogaard J., Anderson F., and Jonsson B., "An econometric analysis health care expenditure: A cross-section study of the OECD countries," *Journal of Health Economics,* vol. 11, pp. 63-84, 1992.

Gujarati D.N., *Basic econometrics,* New York: McGraw/Irwin, 2003.

Hitris T. and Posnett J., "The determinants and effects of health expenditure in developed countries," *Journal of Health Economics,* vol. 11, pp. 173-181, 1992.

Johansen S., "Statistical analysis of cointegration vectors," *Journal of Economics, Dynamics and Control,* vol. 12, pp. 231-254, 1988.

Johansen S. and Juselius K., "Maximum likelihood estimation and inference on cointegration with applications to the demand for money," *Oxford Bulletin of Economics and Statistics,* vol. 52, no. 2, pp. 169-210, 1990.

Judhiana A.G., Mastura M., Zaleha M.N., and. Norashidah M.N, "Determining the income elasticity of health expenditure in Malaysia and policy implications," presented at the APEB Conference, City Bayview Hotel, Penang, Malaysia, 2004.

Jowett M., "Bucking the trend? Health care expenditure in low income countries 1990-1995," *International Journal Health Plan Manage,* vol. 14, pp. 269-285, 1999.

Kiymaz H., Akbulut Y., and Demir A., "Test of stationarity and cointegration of health care expenditure and gross domestic product: An application to Turkey," *European Journal of Health Economic,* vol. 7, pp. 285-289, 2006.

Kleiman E., *The determinants of national outlay on health,* London: MacMillan, 1974.

Koon C.C., "Privatization and the health care sector re-negotiating the social contract," presented at the Second Penang Economic Seminar, Penang, Malaysia, 1996.

Khoon C.C., "Health and development towards the millennium: Re-inventing government, or the demise of community?," presented at the USM/MMA/CAP National Conference on Privatization and Health Care Financing in Malaysia : Emerging Issues and Concerns, Penang, Malaysia, 1997.

mrp.ase.ro
Management Research and Practice
Volume 5 Issue 1 / March 2013

Kornai J. and McHale J., "Is post-communist health spending unusual? A comparison with established market economies," *Economics of Transition,* vol. 8, no. 2, pp. 369-399, 2000.

Kwame P., Gbesemete, and Ulf-Gerdtham, "Determinants of health care expenditure in Africa: A cross-sectional study," *World Development,* vol. 20, no. 2, pp. 303-308, 1992.

MacKinnon J.G., "Numerical distribution functions for unit root and cointegration tests.," *Journal of Applied Econometrics,* vol. 11, pp. 601-618, 1996.

Malaysia Economic Plan. (various years). Kuala Lumpur: Economic Planning Unit, Prime Minister's Department.

Malaysia Economic Report. (various years). Kuala Lumpur: Ministry of Finance.

Ministry Of Health Report. (various years). Kuala Lumpur: Ministry of Health.

Medical and Health Care in Demand. (March 2003). *Medical health insurance.* [Online]. Available: http://www.liam.org.my/liam/homepage/ArtMhi6Eng.html

Matteo L.D., "The income elasticity of health care spending: A comparison of paremetric and nonparametric approaches," *European Journal of Health Economics,* vol. 4, pp. 20-29, 2003.

Matteo L.D., "The macro determinants of health expenditure in the United States and Canada: Assessing the impact of income, age distribution and time," *Journal of Health Policy,* vol. 71, pp. 23-42, 2005.

Mc Lenaghan B.J., *International Financial Statistics Yearbook,* Washington DC: IMF Statistics Department, 1995.

Narayan P.K., "Are the Australian and New Zealand stock prices nonlinear with a unit root?," *Applied Economics,* vol. 37, pp. 2161-2166, 2005.

Narayan P.K., "The behavior of US stock prices: Evidence from a threshold autoregressive model," *Mathematics and Computers in Simulation,* vol. 71, pp. 103-108, 2006.

Newhouse J.P., "Medical-care expenditure: A cross national survey," *Journal of Human Resources,* vol. 12, pp. 115-125, 1987.

Newhouse J.P., "Cross national differences in health spending: What do they mean?," *Journal of Health Economics,* vol. 6, pp. 159-162, 1987.

Owoye O., "The causal relationship between taxes and expenditures in the G7 countries: Co-integration and error correction models," *Applied Economic Letters,* vol. 2, pp. 19-22, 1995.

Parkin D., McGuire A., and Yule B., "Aggregate health care expenditures and national income: Is health care a luxury good?," *Journal of Health Economics,* vol. 6, pp. 109-127, 1987.

Phillips P., "Fully modified least squares and vector autoregressions," *Econometrica,* vol. 63, pp. 1023-1078, 1998.

Toda H.Y. and Phillips P.C.B., "Vector autoregressions and causality," *Econometrica,* vol. 61, pp. 1367-1393, 1993.

Ugo and Qing, "Fiscal sustainability with oil resources: A practical framework," Unpublished IMF Policy Discussion Paper, 2002.

ISSN
2067- 2462