# Implementation of Goods and Service Tax (GST):  An Analysis on ASEAN States using Least Squares Dummy Variable Model (LSDVM)

Saravanan Venkadasalam

*Abstract*—The aim of this work is to analyse the post effect of the goods and service tax (GST) on the national growth. A secondary data for selected ASEAN country from World Bank was retrieved and regression analysis conducted using least squares dummy variable model (LSDVM). Findings revealed that not all countries in ASEAN are experiencing a national growth after implementation of the GST. Some recommendation was drawn to ensure a successful implementation of GST. The survey takes in some implication which will necessitate further research in the future.

*Keywords*—ASEAN, GDP, Goods and Service Tax, Gross Domestic Product, GST, Least Squares Dummy Variable Model, LSDVM

## I. INTRODUCTION

MALAYSIA expected to join as an $8^{th}$ member of the ASEAN states to introduce and implement goods and services tax (GST) in the second quarters of 2015 with the initial expectation it will accelerate the growth, stabilize the fiscal policy and improve the people prosperity.  There are studies shows that implementation of GST is expected to induce the gross domestic product [1] by provides the government revenue and continuously ensure the liquidity of the treasury [2]. But not all countries which implementing the GST are able to generate revenue. Instead, its cost losses to the national income due to unwarranted administrative, compliance costs and avoidable economic distortions [3].

This research will focus on concentrate the post effect of the GST on the selected ASEAN countries. This research also will develop the relationship between the national growth with some of the macroeconomic variable. This research will provide some recommendation to the state administration to carefully manage the matter of implementing GST in the path of avoiding economic turbulence. The result of the research will further heighten the existing economic framework.

Saravanan Venkadasalam  is with the Malaysian Maritime Academy, Masjid Tanah, 78300 Malaysia  (corresponding author's phone: +6-012-970 5242 ; e-mail: v.saravanan@alam.edu.my ).

## II. LITERATURE REVIEW

Goods and service tax (GST) or in some other countries refers as value added tax (VAT) is more than an unproblematic tax [4] and simple tax [2]. It is most common, stable, flexible and modern tax. GST is a multistage consumption taxes with credits facilities [5].

A number of studies have been performed to examine the regressity of implementing the GST. It's even problematic. Most of these studies were on understanding the policy, social, economic, cultural and political impact [6]. These studies explain that the GST will impact all, especially the firms and the public.

In Ireland, a study shows that even though the government's given abolishment of VAT to household basic consumables, it's still noticed that highest proportion of disposal income in VAT. VAT system disproportionately hits the poorest households [7]. Locally, a study on estimating the compliance cost of companies in Malaysia, found that the implementation of the GST will increase the firm's compliance cost on the tax computation and tax planning [8].

Except Malaysia, Brunei and Myanmar, the residue of the ASEAN member nations are already introducing and implement the GST system. The current literature did not contemplate the past impact of the GST on ASEAN countries. This report investigates the stability of their development by studying the post effect of the GST.

## III. METHODOLOGY

The aim of this work is to analyse the GST implementation effect on the ASEAN state's growth. Based on economic growth theory, the internal growth can measure by the totality of the gross value added by all residential producers in the economic system. The gross domestic product (GDP), the national growth indicator is the measurement of the national final consumption expenditure, national capital formation and net export. Since the GST applied on all the points of disposal incomes on consumption, the research attempts to calculate the relationship within the GDP, household final consumption expenditure, general government consumption expenditure and

dummy variables for the GST effect between nations.

A secondary data of the real GDP, household final consumption expenditure (HCE), general government final expenditure (GCE) for Philippines, Singapore and Thailand were gathered since year 1960 from the World Bank database. GST in Philippines, Singapore and Thailand was implemented in 1988, 1994 and 1992 respectively. Total 54 observations gathered for each country. Panel data analysis utilised in this research due to its ability to study the dynamic of change and to study more complicated behavioural model [9].

Since this is a panel data analysis, it is necessary to identify which model is appropriate to use to avoid omitting variable bias. Hausman test carried out to identify either fixed effect or random effect model which able to control some types of omitted variables. Fixed effect model or least square dummy variable model (LSDVM) able to control omitted variable between cases but constant over time. The random effect model used when there is some variables constant over time, but varies between cases and others fixed between cases but vary over time.

## IV. EMPIRICAL RESULTS

Based on the Hausman test, it was identified that least squares dummy variable model is an appropriate model for this panel data analysis. This model easy to estimate and interpret [10]. The model articulates an explicit relationship between GDP, household final consumption expenditure, general government consumption expenditure and dummy variables for each cross section. Total three dummy variables used to quantify the variance of the GST effects on the three countries: Philippines, Singapore and Thailand. The regression model with the inclusion of the dummy variables is represented in the equation 1.

$$LGDP_{ti} = \beta_0 + \beta_1 LHCE_{ti} + \beta_2 LGCE_{ti} + \lambda_1 D1_t + \lambda_2 D2_t + \lambda_3 D3_t + \varepsilon_t \qquad (1)$$

Where,

$LGDP_{ti}$ = Natural logarithm of real GDP

$LHCE_{ti}$ = Natural logarithm of household final consumption expenditure

$LGCE_{ti}$ = Natural logarithm of general government final expenditure

$D1_t$ = A dummy variable that equal to one during GST and is zero elsewhere in the Philippines

$D2_t$ = A dummy variable that equal to one during GST and is zero elsewhere in the Singapore

$D3_t$ = A dummy variable that equal to one during GST and is zero elsewhere in the Thailand

$\beta_0$ = Estimated coefficient of the intercept

$\beta_1$ = Estimated coefficient of household final consumption expenditure

$\beta_2$ = Estimated coefficient of general government final expenditure

$\lambda_1$ = Estimated coefficient of dummy variable for

the Philippines

$\lambda_2$ = Estimated coefficient of dummy variable for the Singapore

$\lambda_2$ = Estimated coefficient of dummy variable for the Thailand

$\varepsilon_t$ = Residual for the long run equation

Table I indicates the regression results using panel least squares dummy variable model of gross domestic product in Philippines, Singapore and Thailand for the period of 1960 to 2013. The model aims to study the relationship between the GDP in these countries with the household final consumption expenditure, general government consumption expenditure and the consequences of implementing GST in respective countries.

The estimation shows that only 99.75% of the fraction between the variables can be explained in this study. This show that only about 0.25% variation on this model was left uncounted, which was attributed to the error term. In overall, this study was significant at a level of 1%. The probability of the F - statistic is indicating that the dependent variable could be attributed by the change in the independent variables.

TABLE I
LEAST SQUARE DUMMY VARIABLE ESTIMATION OF GDP

| Variables | LGDP*** |
|---|---|
| Intercepts, c | 0.573846*** (2.781346) |
| Household final consumption expenditure, LHCE | 0.549176*** (14.04420) |
| General government final expenditure, LGCE | 0.484865*** (13.65850) |
| After implementing of GST, in the Philippines | -0.164259*** (-6.212342) |
| After implementing of GST, in Singapore | 0.179824*** (6.841773) |
| After implementing of GST, in Thailand | -0.079034*** (-2.949273) |
| Adjusted $R^2$ | 0.997488 |
| F-Statistic | 12789.71 |
| Total panel observations, N | 162 |

*** Significant at 1% significance level
() T-Statistic value

Specifically, a percentage of increase in household final consumption expenditure will increase the GDP by 0.549176% and a percentage of increase in general government consumption expenditure will result in an increment of the GDP by 0. 484865%. Both variables are statistically significant in explaining the current level of the GDP at the 1% level.

Table 1 also shows that if all other variables are fixed, the GDP in the Philippines and in Thailand was reduced by 16.4259% and 7.9034% respectively after implementing the GST. Only in Singapore, the GDP is increased by 17.9824% during the period of implementing the GST.

## V. CONCLUSIONS

The purpose of this paper is to analysis the effect of the GST on ASEAN country such as Philippines, Singapore and Thailand. A panel analysis technique was utilised for this determination. The relationship between a nation's growth to the household final consumption expenditure, general government consumption expenditure and the post GST effect were stated in the equation 2.

$$LGDP_{ti} = 0.573846^{***} + 0.549176\ LHCE_{ti}^{***} + 0.484865\ LGCE_{ti}^{***} - 0.164259\ D1_t^{***} + 0.179824\ D2_t^{***} - 0.079034\ D3_t^{***} + \varepsilon_t \qquad (2)$$

*** Significant at 1% significance level

The above results suggest that the household final consumption expenditure and general government consumption expenditure are positively significantly related to the gross domestic product as required and support the economic theories. But the effect of the post GST differs in countries. Philippines and Thailand show significant negative relationship with their nation's development. Meanwhile, Singapore shows a significant positive relationship.

It is undeniable that those countries whom implementing GST always encounter grows. Nevertheless, the extent of the impact varies depending on the governance, compliance cost and economic distortion. A positive impact of GST depends on a neutral and rational design of the GST such a way it is simple, transparent and significantly enhances involuntary compliance [11]. Its must be actual, not presumptive, prices and compliance control would be exercised through an auditing system [3].

This study has its own implication. Firstly, seven of the ten ASEAN nations are already implementing the GST. This paper only able to collect the information for three states. The respite of the countries data is insufficient to conduct balanced panel regression. Secondly, this survey did not focus on performing any forecasting of the Malaysia revenue after introducing and implement the GST. By knowing the GST rate, it will be a good analysis to recover out the degree of anticipated receipts. The future research can focus on above implication to further improve and sustain the existing theoretical accounts.

## REFERENCES

[1] Vasanthagopal, R., GST in India : A Big Leap in the Indirect Taxation System. *International Journal of Trade, Economics and Finance*, 2(2), 144–147, 2011.

[2] Nakhchian, A., Gorji, N., Shayesteh, T., & Sheibany, E., Value Added Tax and Its Relationship With Management Information Technology. *Interdisciplinary Journal of Contemporary Research in Business*, 4(9), 402–410, 2013.

[3] Cnossen, S., Preparing the way for a modern GST in India. *International Tax and Public Finance*, 20(4), 715–723, 2013. http://dx.doi.org/10.1007/s10797-013-9281-0

[4] Benge, M., Pallot, M., & Slack, H., POSSIBLE LESSONS FOR THE UNITED STATES FROM NEW ZEALAND ' S GST. *National Tax Journal*, 66(2), 479–498, 2013

[5] Gelardi, A. M. G., Value Added Tax and Consumer Spending: A Graphical Descriptive Analysis. *Asian Journal of Finance & Accounting*, 5(1), 1–21, 2012. http://dx.doi.org/10.5296/ajfa.v5i1.2762

[6] Anushuya, & Pal, N. K., Indian Indirect Tax Systems ' Reforms and Goods and Services Tax. *Advances In Management*, 7(7), 9–15, 2014.

[7] Leahy, E., & Tol, R. S. J., The Distributional Effects of Value Added Tax in Ireland. *The Economic and Social Review*, 42(2), 213–235, 2011.

[8] Palil, M. R., Ramli, R., Mustapha, A. F., & Abu Hassan, N. S., Elements of Compliance Costs : Lesson from Malaysian Companies towards Goods and Services Tax ( GST ). *Asian Social Science*, 9(11), 135, 2013. http://dx.doi.org/10.5539/ass.v9n11P135

[9] Gujarati, D. (2012). Basic econometrics. Retrieved from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Basic +Econometrics#0

[10] Ali, H., Er, A. C., Ahmad, A. R., Lyndon, N., & Ahmad, S., An Analysis of the Impact of Foreign Investment on Regional Disparities : A Case of Malaysia. *Asian Academy of Management Journal of Accounting and Finance*, 9(14), 7–18, 2013.

[11] Khan, M., & Shadab, N., Goods and Services Tax (GST) in India: prospect for states. *Budgetary Research Review*, 4(1), 38–64.n.d