The Export-Led Growth Hypothesis: The Philippine Case

Edgar H. Mendoza
Polytechnic University of the Philippines, Cuta Duluhan, Batangas City, Philippines, 4200 mendozaedgar0305@yahoo.com

Abstract: This study aimed to find out whether the Export-Led Growth Hypothesis holds true in the Philippine. Multiple regression analysis was conducted to attain the objective of the study and the model generated were tested using Augmented Dickey-Fuller Unit Root Test, Jarque Bera, Correlation Matrix, Durbin-Watson Test, Auto-regressive Conditional Heteroskedasticity Test, Chow-break point test, Ramsey Reset Test and Johansen Co-integration Test to ensure the validity of model. The results of the study revealed that all the variables of the model passed unit root test at first difference. Analysis of correlation results showed that the rate of growth in real export and rate of growth in export budget had a positive relationship with the rate of growth in RGDP. Rate of growth in real export significantly affected the rate of growth in RGDP. A one percentage point increase in real exports brought about 0.001448 percent to RGDP growth. Rate of growth in export budget also significantly affected the growth in RGDP. Thus, a one percent increase in export budget led to a 0.000221 percent rose in RGDP’s growth rate, ceteris paribus. Moreover, the model itself was statistically significant with a goodness of fit R² of 0.65. The model also satisfied all the econometric criteria of absence of autocorrelation, no trace of specification error, and the stability of the regression parameters. Lastly, the variables were cointegrated ruling out spurious regression results. In this study, the Export-led growth hypothesis holds true in the Philippines based on the empirical results. A long run equilibrium relationship was present among the selected variables and the results therefore are not spurious. It can be said that, an increase in export would lead to RGDP growth.

Keywords: Export-led growth hypothesis, Real Gross Domestic Product, Real Export, Export Budget.

1. Introduction

Economic growth is the most important means of raising people’s incomes and reducing poverty in the developing world. It creates jobs and opportunities for poor people to support their families and build a more suitable future. However, many developing countries face particular challenges that make it difficult for them to stimulate and sustain economic growth. These challenges include weak institutions, high unemployment, poor infrastructure, lack of access to financial services, and unsuitable laws and regulations [1]. Thus, different economic growth drivers existed, namely: savings and investment, human capital, rate of technological change, capital and labor inputs, and natural endowments. Moreover, Harrod-Domar growth model stresses the importance of savings and investment as key determinants of growth. Basically, this model suggests that the economy’s rate of growth depends on savings ratio and capital-output ratio. Meanwhile, endogenous growth economists believe that improvements in productivity can be linked directly to a faster pace of innovation plus investment in human capital; while neo-classical economist on the Solow growth model believes that to raise the trend rate of growth requires an increase in the labor supply and also a higher level of productivity of labor and capital [2]. Consequently, this study gave emphasis on the growth rate in real export as an engine of growth. According to the export-led growth hypothesis, export growth is one of the key determinants of economic growth. It holds that the overall growth of countries can be generated not only by increasing the amounts of labor and capital within the economy, but also by expanding exports. Participating in trade, especially export production and promotion, exposes a country to the latest and most advanced production and marketing techniques, and a “learning-by-doing” process that brings about dynamic innovation and technological diffusion into the economy [3]. According to the 2012 International Monetary Fund statistics, Philippines has become known for services and manufacturing after being an agricultural country. The GDP growth rates, reaching 6.8 percent in 2012 and 7.7 percent in the first quarter and 7.5 percent in the second quarter of 2013 were the highest GDP growth rates in Asia for the first two quarters of 2013, followed by China and Indonesia. Moreover, total exports in the Philippines grew with its increase from US$ 47 Billion to US$ 58.98 Billion from 2006 up to 2013. Primary exports include semiconductors and electronic products, transport equipment, garments, copper products, petroleum products, coconut oil, and fruits [4]. In addition, while United States and Japan have remained the country’s two largest export markets, China and ASEAN countries were the next top exporters. Other key markets include Hong Kong, Germany, Netherlands, South Korea, France, and India. Aside from diversifying its markets and increasing its concentration on the production of goods and services with clear competitive advantage, the Philippines is looking to further value add growth sectors such as IT-BPO and penetrate high growth markets in Asia to achieve the projected growth for the next two years [5]. With regard the rate of growth, the service sector reached the highest percentage which contributed 54.4 percent of the total real export, while industry sector has 33.3 percent and agricultural sector comprised 12.3 percent [6]. As a result, this study sought to know if real export can be one of the economic drivers of the economy as supported by the export-led growth hypothesis. In addition, this study also tackled the relevance of export-led growth hypothesis, whether this can really be true in the case of the Philippines.

2. Objective of the Study

This study aimed to find out whether the Export-Led Growth Hypothesis holds true in the Philippines. This problem also aimed to attain the following:

1. To describe the behavior of the rates of growth of the following variables:
   1.1 RGDP;
   1.2 Real Export; and
   1.3 Export Budget?
2. To test if there is a significant relationship between the rate of growth in real export, rate of growth in export budget, export promotion and rate of growth in RGDP in the Philippines.

3. To test if the explanatory variables such as rate of growth in real export, rate of growth in export budget, and export promotion have a significant effect, individually and collectively, on the rate of growth in RGDP.

4. To determine if there is a long-term equilibrium relationship among the rate of growth in real export, rate of growth in export budget and rate of growth in RGDP.

3. Methodology

3.1 Research Design
A descriptive–causal approach was adopted in this paper. The descriptive aspect focused on the historical performance of the Philippines in terms of the rate of growth in real exports including the rate of growth in export budget and export promotion and rate of growth in RGDP over time, bolstered by tabular and graphical presentations of the data. It therefore describes what, when, and how of the study [7]. The causal dimension of the study is shown through the estimation of the nature, direction, and magnitude of the relationship between selected dependent variable and its covariates or independent variables through the use of regression analysis, a technique for quantifying the relationship between economic variables that the researcher seeks to explain (dependent variable) and the explanatory variables [8].

3.2 Sources of Data
In this study, secondary data were utilized such as the growth rates of RGDP, Real export, and Export budget. The export promotion was treated as dummy variable covering the period of 1980 to 2013. The data used in this study were gathered from the websites of World Bank and National Statistics Coordination Board (NSCB). The data on export budget were taken from the Department of Budget Management (General Appropriations Act for DTI under Board of Investment). The information regarding export promotion was obtained from the Department of Trade and Industry.

3.3 The Model
The Multiple Regression model is presented below as:

\[ \text{RGDP}_t = \beta_0 + \beta_1 \text{RX}_t + \beta_2 \text{XB}_t + \beta_3 D + \epsilon \]  

(eq. 2)

Where:

- \( \text{RGDP}_t \): rate of growth in Real Gross Domestic Product
- \( \text{RX}_t \): rate of growth in Real Export
- \( \text{XB}_t \): rate of growth in Export Budget
- \( D \): Dummy for export promotion (with a value of 1 for years with and 0 if otherwise)
- \( B \): Parameter Estimates
- \( E \): Error term

3.4 Statistical Treatment of Data
The reliability and adequacy of the model were assessed using a set of tests. To facilitate the computation of the different statistical requirements, Econometric Views (E-views) was used.

3.4.1 Test of Stationarity
Augmented Dickey-Fuller Unit Root Test was used to test the stationarity of time series data. If the absolute value is greater than the absolute of McKinnon critical value at the chosen level of significance, the series is stationary. Otherwise, it is non-stationary [8].

\[ \Delta Y_t = \alpha + \beta Y_{t-1} + \delta_1 \Delta Y_{t-1} + \ldots + \delta_{t-2} \Delta Y_{t-1} + \epsilon \]  

(eq. 3)

Where:

- \( \alpha \): constant
- \( \beta \): coefficient on a time trend
- \( \gamma \): lag order of the autoregressive process

3.4.2 Test of Correlation
Correlation coefficient was computed to measure the degree of linear relationship between any two variables. It can be computed as follows:

\[ t = r \sqrt{n-2}/\sqrt{1-r^2} \]  

(eq. 4)

However, correlation can be put into matrix called correlation matrix. The correlation coefficient may take on any value between plus and minus one. It lies between the limits of -1 and +1; that is, \(-1 \leq r \leq 1\). The sign of correlation coefficient (+ or -) defines the direction of the relationship, either positive or negative. A positive correlation coefficient means that as the value of a variable increases, the value of the other variable increases. Moreover, a negative correlation coefficient indicates that as one variable increases, the other decreases [8].

3.4.3 Statistical Significance of the Regression Parameters
To test the statistical significance of the parameter estimates, the t-test was applied. The formula is:

\[ t = \frac{\hat{\beta} - \hat{\beta}}{\hat{\sigma} (\hat{\beta})} \]  

(eq. 5)

where the value of the estimated parameters is divided by its standard error to get the t-statistic. The parameters \( \beta_1 \), \( \beta_2 \) ... \( \beta_n \) are said to be statistically significant if the value of the computed t-statistic exceeds the critical value of the t-distribution at \( \alpha \) a chosen level of significance with \( n - k \) degrees of freedom [8].

3.4.4 Test of Overall Significance of the Regression
The overall significance of the regression was tested by the ratio between explained variances and unexplained variances using the F-statistics:

\[ F = \frac{R^2 / (k - 1)}{(1 - R^2) / (n - k)} \]  

(eq. 6)

If the value of the computed F-statistic exceeds the critical value of the distribution at a chosen level of significance with \( k - 1 \) numerator and \( n - k \) denominator degrees of freedom, reject \( H_0 \); otherwise do not reject it. Alternatively, if the p-value of the observed F is sufficiently low, reject \( H_0 \) [8].

3.4.5 Goodness of Fit
\( R^2 \) is viewed as the proportion of the total variation dispersion in the dependent variable (about its mean) that is
explained by the variation in the independent variable in the regression. It is used to determine how the observed data points fall on the regression line [8].

\[
R^2 = 1 - \frac{\sum (y_i - \hat{y}_i)^2}{\sum (y_i - \bar{y})^2}
\]  
\[\text{(eq. 7)}\]

On the other hand, the adjusted coefficient of determination \( R^2 \) was used in order to take into account the reduction in the number of degrees of freedom as additional explanatory variables are included in the regression [8].

\[
R^2 = 1 - \frac{(1 - \hat{R}^2)(n - 1)}{n - k}
\]  
\[\text{(eq. 8)}\]

3.4.6 Test of Autocorrelation

To detect the presence of serial correlation in the regression residuals, the Durbin Watson test was employed. Its formula is as follows:

\[
d = \frac{(\sum_{t=2}^{n} e_t - e_{t-1})^2}{\sum_{t=1}^{n} e_t^2}
\]  
\[\text{(eq. 9)}\]

If the computed \( d \) statistic is greater than the critical upper limit of 4 minus the critical upper limit (i.e., \( d < d < 4 - d_u \)) at a chosen level of significance, there is no evidence of positive or negative autocorrelation [8].

3.4.7 Test of Specification Error

Ramsey’s Reset (regression specification error test) was employed as a general test of misspecification of the model.

\[
F = \frac{(\hat{R}^2_{\text{old}} - \hat{R}^2_{\text{new}})/(k - 1)}{(1 - \hat{R}^2_{\text{new}})/n - k}
\]  
\[\text{(eq. 10)}\]

If the computed \( F \) ratio is higher than the critical value at \( \alpha \) percent level of significance error exists. On the other hand, if the calculated \( F \) ratio is lower than the critical value, it can be inferred that there is no specification error in the model presented [8].

3.4.8 Test of Heteroskedasticity

To determine if the variance of the error is constant for all the values of the independent variables, the Autoregressive Conditional Heteroskedasticity (ARCH) test was used. Its formula is as follows:

\[
\text{var}(u_t) = \sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \alpha_2 u_{t-2}^2 + \ldots + \alpha_p u_{t-p}^2
\]  
\[\text{(eq. 11)}\]

If the Chi-square value obtained exceeds the critical Chi-square value at \( \alpha \) percent level of significance, there is evidence of heteroskedasticity. If it does not exceed the critical value, there is no heteroskedasticity [8].

3.4.9 Test for Structural Stability

The Chow Breakpoint test was applied to find out whether there is a structural change in the functional relationship between two (2) time periods. This test assumes that the disturbances term is constant for all periods.

\[
F = \frac{S_3}{S_2 - S_1}
\]  
\[\text{(eq. 12)}\]

Where:

- \( S_1 \) = residual sum of squares (RSS) with df = \((n_1 + n_2 - k)\)
- \( S_2 \) = residual sum of squares (RSS) with df = \((n_1 - k)\)
- \( S_3 \) = residual sum of squares (RSS) with df = \(n_2 - k)\)

Chow Test follows the F distribution with df = \((k, n_1 + n_2 - 2k)\). If the F computed F exceeds the critical F value at a chosen level of significance, reject the hypothesis that the regressions are the same, that is, the hypothesis of structural stability. Alternatively, if the p value of the F obtained is lower than the critical value, reject the null hypothesis of structural stability [8].

3.4.10 Test of Normality

The Jarque-Bera test was used to determine the normality of the regression residuals. The Jarque-Bera is computed from skewness and kurtosis and asymptotically follows the chi-squared distribution with two degrees of freedom. Its formula is:

\[
JB = n \left[ \frac{S^2}{6} + \frac{(K-3)^2}{24} \right]
\]  
\[\text{(eq. 13)}\]

If the p value of the computed Chi-square statistic in an application is sufficiently low, one can reject the hypothesis that the residuals are normally distributed. But if the p value is reasonably high one does not reject the normality assumption.

3.4.11 Cointegration Test

The model was tested for cointegration to avoid the spurious regression phenomenon. The method to be employed was the Johansen Cointegration procedure. In vector error procedure (VECM) form, it is expressed as:

\[
\Delta X_t = \Pi \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \Gamma_3 \Delta X_{t-3} + \ldots \Gamma_p \Delta X_{t-p} + \Delta \nu_t
\]  
\[\text{(eq. 14)}\]

The \( \Pi \) matrix contains information regarding long run relationships and which can be decomposed into \( \Pi = \alpha' \beta \) where \( \alpha \) is the speed of adjustment to equilibrium, or error correction term, and \( \beta \) is the matrix of long-run coefficients.

4. Results and Discussions

1. Presentation and Analysis of Data

This part shows the trend of Philippine data in terms of growth rates of the chosen variables. The dependent variable is the rate of growth in Real Gross Domestic Product and the independent variables are the rate of growth in real exports, and rate of growth in export budget. Trends of each respective variables were interpreted through analyzing the events that causes the increase or decrease of the recorded data covering from 1980-2013.

1.1 Rate of Growth in RGDP
Figure 2 shown on the next page presents the behavior of the productive capacity of the economy in growth rates. It can be generally observed that the rate of growth in RGDP has wide fluctuations. Year 1985 had the lowest recorded real gross domestic product with -7.31 percent. The main reason is that the Philippine economy suffered a great decline after the Aquino assassination in August 1983. The wave of anti-Marcos demonstrations in the country that followed scared off tourists. The political troubles also hindered the entry of foreign investments, and foreign banks stopped granting loans to the Philippine government. The economy experienced negative economic growth in 1984 and continued to decline despite the government’s recovery efforts. Through different initiatives, foreign borrowing pumped up the economy, but it failed to establish self-sustaining growth. This recovery program’s failure was caused by civil unrest, rampant graft and corruption within the government and by Marcos’ lack of credibility. At the same time, the excesses of the Marcos government weakened the private business sector, leaving the country vulnerable to the shocks of the 1980s [9]. During the administration of Pres. Benigno Aquino III, Real Gross Domestic Product grew at 4.9 percent in the first quarter of 2011, a growth rate which was markedly lower than the 8.4 percent rate in the same period of 2010. Consecutive quarters were not strictly comparable but it can still be noted that the first three quarters of the Aquino administration had seen progressively slower growth year-on-year from 8.9 percent in the second quarter of 2010, 7.3 percent in the third quarter, and 6.1 percent in the fourth quarter, followed by the 4.9 percent in the first quarter of this year [10]. The Philippines’ full year GDP in 2013 grew by 7.2 percent, higher than the government’s expectations of 6 percent to 7 percent and despite several challenges that strained the economy in 2012. The 2013 GDP growth was higher than the 6.8 percent posted in 2012. The country’s GDP grew by 3.7 percent in 2011 and 7.6 percent in 2010. Balisacan said that the economy grew better than the government’s official target of 6 to 7 percent for 2013, but added that it could have been higher, if the country had not been affected by various disasters such as Bohol earthquake, Zamboanga siege, and typhoon Yolanda. However, the Philippines remained as one of the best performing economies in the Asian region in the fourth quarter of 2013, second to China, which grew by 7.7 percent. On the supply side, the services and industry sectors continued to be the drivers of economic growth, expanding by 7.1 percent and 9.5 percent in 2013, respectively. The services sector contributed 3.6 percentage points of the real GDP growth in the fourth quarter of 2013. This was followed by the industry sector with 2.8 percentage points and agriculture with 0.1 percentage point. Fourth-quarter growth on the supply side was mainly propelled by manufacturing, trade, finance and real estate. Meanwhile, on the demand side, growth was boosted by household consumption, which contributed 4.2 percentage points, and net exports, which contributed 1.6 percentage points [11].

1.2 Rate of Growth in Real Exports

Based on Figure 3, it can be gleaned that the rate of growth in real export experienced an extreme rise and fall. There was a big fall from 39.82 percent in 1980 to 9.48 percent in 1981. This was due to the domestic financial crisis in 1981 that brought about the failure of several large firms, many of which were bailed out by the government. Industrial failures continued to proliferate, leaving the Philippine government, and particularly the two major state banks, with nonperforming assets with a book value in the billions of dollars [9]. This resulted not only to weak international prices, but also falling commodity export volumes.

Domestic and international recovery during the period of 1998 to 2010 resulted to the continued rise of exports as well as change in its composition. In 1998, the rate of growth in real exports was -21.03 percent then went up in 2000 with 13.72 percent; and in 2010, 20.97 percent. Throughout 1998 to 2010, total real exports increased at 6.2 percent per year. The latter period from 2003 to 2010 marked a higher rise of exports, representing recovery from the financial crisis of the earlier period. Electronics and related processing semiconductor exports still dominated the goods trade accounting for around 70 percent of total export trade in goods. Export of services, a distinctive feature of the rise in exports, was the change in the composition of exports. Though exports of goods recovered, the earnings rose more sharply in the export of services. The average real growth of export of services from 1998 to 2010 was 9.1 percent per year. The export of services fell by one percent per year from 1998 to 2002. Then, the recovery, including the growth of new services exports, was strong thereafter. From 2003 to 2010, the export of services rose at 14.3 percent per year [12]. As of 2012, the primary exports of the Philippines were semiconductors and electronic products, transport equipment, garments, copper products, petroleum products, coconut oil, and fruits. Major trading partners of the Philippines were the United State (17.6 percent of total exports), Japan (16.2 percent), Netherlands (9.8 percent), Hong Kong (8.6 percent), China (7.7 percent), Germany (6.5 percent), Singapore (6.2 percent), and South Korea (4.8 percent). However, major problems remained, mainly having to do with alleviating the wide income and growth disparities between the country’s different regions and socioeconomic classes, reducing corruption, and investing in the infrastructure necessary to ensure future growth [13].
1.3 Rate of Growth in Export Budget

It can be seen from Figure 4 that the rate of growth in export budget varies each year. During the Marcos administration, the entire 1980’s was a lost decade for Philippine growth: 1984-1985, the country had its first recession in the postwar era. The population growth rate, which has been 2 percent in this century, was declining in most regions of the Philippines. The 1980 census showed a decline in the proportion of the population. A decline in GDP of the country and in the proportion of the population resulted to a minimal decrease from the budget from 1984 to 1985 by 6.97 percent [11]. The economy recovered in 1986 and this was sustained until 1989 when some political shocks slowed it down. Natural disasters occurred in 1990 and 1991 causing another slow down followed by another crisis in 1992. But despite these occurrences, the budget for trade promotion showed increasing trend from 1986 to 1995. In 1998, the Philippine economy deteriorated again as a result of spill over from the Asian Financial crisis, although not as much as other Asian nations. A wave of natural disasters likewise dragged the economy down. This was largely due to the fiscal conservativism of International Monetary Fund that was against to massive spending of its neighbours on the rapid acceleration of economic growth.

Figure 4. Rate of Growth in Export Budget, 1980-2013

2.2 Analysis of Regression Results

To test the significance of the relationships between rate of growth in real gross domestic product as the dependent variable, and the three explanatory variables: rate of growth in real export, rate of growth in export budget, and export promotion as dummy, regression analysis was performed.

Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>-0.13861</td>
<td>3.829</td>
<td>0.0001</td>
</tr>
<tr>
<td>RX</td>
<td>0.1473356</td>
<td>2.931</td>
<td>0.0083</td>
</tr>
<tr>
<td>XB</td>
<td>0.0214522</td>
<td>0.01019</td>
<td>0.9179</td>
</tr>
</tbody>
</table>

Table 2 Initial Regression Results

Table 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX</td>
<td>0.022142</td>
<td>0.65</td>
<td>0.5135</td>
</tr>
</tbody>
</table>

The regression results indicated that the rate of growth in real export and the rate of growth in export budget significantly affects the rate of growth in RGDP, because their respective computed t-values of 5.2029 and 2.3555 are greater than the critical t-value of 1.699 at 5 percent level of significance and df = 29. Hence, the null hypothesis that the rate of growth in RGDP is not significantly affected by the rate of growth in real export and the rate of growth in export budget was rejected. However, in the case of export promotion as a dummy variable, it has an insignificant effect on the rate of growth in RGDP as evidenced by its computed t value of 0.789526 that is less than than the critical value at 5 percent level of significance. Based on the regression results, a one percentage point increase in real exports brought about 0.001448 percent to RGDP growth, ceteris paribus. While a one percent increase in export budget led to a 0.000221 percent rise in RGDP’s growth rate, ceteris paribus. On the other hand, while export promotion exerts a positive effect on RGDP growth, its contribution to RGDP growth is not statistically significant. The coefficient of multiple determination as signified by the adjusted R² of 0.65, suggested that 65 percent of the total variation in the rate of growth of RGDP is being explained by the variations of rate of growth in real export, rate of growth in budget and export promotion. The computed F-value of 12.94, which exceeded the critical F-value of 2.935 at 0.05 level of significance and degrees of freedom 2 and 29 showed that the parameter estimates of the independent variables altogether or the model in itself is statistically significant in explaining the rate of growth in RGDP. Hence, the null hypotheses that there is no significant effect in the rate of growth in RGDP and rate of growth in real export, rate of growth in export budget and export promotion when taken collectively were rejected. The degree of linear relationships between variables included in the model is displayed in Table 4. The correlation matrix conveys the relationship among the rate of growth in RGDP, rate of growth in real export, and rate of growth in export budget. Coefficient ranges from -1.0 to 1.0. The closer r is to +1 or -1, the more closely the two variables are related.

Table 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>RGDP</th>
<th>RX</th>
<th>XB</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>1</td>
<td>0.513506072094</td>
<td>0.531988685459</td>
</tr>
<tr>
<td>RX</td>
<td>0.513506072094</td>
<td>1</td>
<td>0.0494645121037</td>
</tr>
<tr>
<td>XB</td>
<td>0.531988685459</td>
<td>0.0494645121037</td>
<td>1</td>
</tr>
</tbody>
</table>
As shown in the table, there is a statistically significant relationship between the rate of growth in RGDP, rate of growth in real export, and rate of growth in export budget as it lies between the limit of -1 and +1; that is -1 ≤ r ≤ 1. The positive (+) algebraic sign of the variables, suggests that an increase of RX, would likewise increase RGDP. However, the XB, also led to an increase in RGDP growth. Therefore, the results of the two variables and their respective algebraic signs agreed with the theoretical expectation of the model.

2.3 Analysis of Autocorrelation

The test for the first-order until second-order serial correlation signified by the Durbin Watson statistic 1.99 showed that after correcting for autocorrelation disturbances AR(1) and AR(2), the model is held clean from positive, negative, or indeterminate autocorrelation. It satisfies the condition 4 < d < 4- dₐₙ in values 1.650 < 1.99 < 2.35.

2.4 Analysis for Specification Error Test

The test for the specification error in the regression done also plays a major part in validating the model. To this end, the Ramsey Regression Specification Error Test (RAMSEY RESET) is tapped.

Table 5

<table>
<thead>
<tr>
<th>F-Statistic</th>
<th>Probability</th>
<th>0.384261</th>
</tr>
</thead>
</table>

As shown in Table 5, the F statistic is below the F critical value of 2.935 (0.05, 2.29) and the probability of accepting the null hypothesis of no specification error is 0.384261, which is way above the rejection probability of 0.05. Hence, the model can be said as correctly specified and there is no specification error in the model presented.

2.5 Constancy of Variance

The next process is to determine whether the variances of the regression coefficients are consistent over time. To this end, the study has employed the Autoregressive Conditional Heteroskedasticity (ARCH) Test and the results are as follows:

Table 6

<table>
<thead>
<tr>
<th>F-Statistic</th>
<th>Probability</th>
<th>0.266540</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.389150</td>
<td>2.798985</td>
<td>0.246722</td>
</tr>
</tbody>
</table>

The results given in Table 6 showed a Chi-square value of 2.798985 with a probability of 0.246722 indicative of the absence of heteroskedasticity or differencing variance. Therefore, the variance of every disturbance term regression is homoskedastic.

2.6 Analysis of Structural Stability

The stability of the model cannot be overemphasized because of its importance in policy analysis and forecasting. To find out if the parameters of the model were stable, the Chow Breakpoint Test was applied to validate if there is structural change in the model.

Table 7

<table>
<thead>
<tr>
<th>F-Statistic</th>
<th>Probability</th>
<th>0.381009</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.129800</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As revealed in the Chow Breakpoint Test results in Table 7, the test was done by dividing the 34 year time period by half. The forecast point year was 1996 being the middle of array. The computed F-statistics of 1.129800 yielded a p-value which exceeded the 5 percent level of significance. Therefore, there is parameter stability in the model.

2.7 Analysis of Normality Test

The Jarque-Bera Normality Test was used to verify the normality of residuals.

Figure 5. Jarque-Bera Normality Test

In Figure 5, the Jarque-Bera statistic has a value of 3.000088 with a p-value of 0.223120 which exceeded the 5 percent level of significance. Hence, the residuals of the model can be said as normally distributed. Therefore, regression parameters and their tests of significance are deemed valid.

2.8 Establishing the Long-Term Relationship of the Variables

Lastly, to determine if there exist the long run equilibrium relationships between the rates of growth in RGDP, real export, and export budget, the Johansen Cointegration Test was employed. The results are summarized in Table 8.

Table 8

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>5 Percent Critical Value</th>
<th>Hypothesized no. of CE(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.710700</td>
<td>74.87123</td>
<td>34.91</td>
<td>None**</td>
</tr>
<tr>
<td>0.520370</td>
<td>35.18197</td>
<td>19.96</td>
<td>At most 1**</td>
</tr>
<tr>
<td>0.305592</td>
<td>11.67028</td>
<td>9.24</td>
<td>At most 2*</td>
</tr>
</tbody>
</table>

*(* *) denotes rejection of the hypothesis at 0.05 significance level

Trace Test indicates 3 cointegrating equations at the 0.05 significance level
Trace Test indicates 2 cointegrating equations at the 0.01 significance level

The test results displayed in Table 8 reveal the long-term relationships among the selected variables. Since, the trace statistics exceeded the critical value at 5 percent level of significance, it can be said that there are three cointegrating equations. Hence, the rate of growth in RGDP, rate of growth in real export and rate of growth in export budget do
have a long-term relationship and can be regressed without fear of committing spurious or non-sense regression. Therefore, the null hypothesis of no long-run equilibrium relationship among variables could be rejected.

5. Conclusions
The following conclusions were drawn from the findings:
1. The rate of growth in Real Gross Domestic Product, Real export, and Export budget’s wide fluctuations can be attributed to disturbances experienced in the country that were either political or economic in nature.
2. Both rates of growth in real export and rate of growth in export budget have positive relationship and have significant effects on the rate of growth in RGDP. This implies that an increase on the rate of growth in real export increases the rate of growth in RGDP. Moreover, an increase in the rate of growth in export budget lead to a rise in RGDP growth. On the other hand, export promotion has an insignificant effect on RGDP growth but bears a positive sign which is consistent with the theoretical expectations.
3. All the explanatory variables when taken collectively have a significant effect on the RGDP growth rate.
4. There is a long-run relationship between the rate of growth in RGDP, rate of growth in real exports, and rate of growth in export budget.
5. The export-led growth hypothesis holds true in the Philippines as confirmed by the empirical results in the study wherein rate of growth in real exports exerts a significant effect on RGDP growth, ceteris paribus.

6. Recommendations
Based on the conclusions drawn, this study proposes the following recommendations:
1. Since the results showed that the rate of growth in real export, other things constant, exert a significant effect on RGDP growth, the government should aggressively pursue a strategy of promoting and sustaining growth in exports.
2. There must be better coordination and cooperation among government agencies like the Department of Trade and Industry (DTI), Department of Agriculture (DA), Department of Environment and Natural Resources (DENR), the National Economic Development Authority (NEDA), and the exporters thru Philippine Exporters Confederation in designing programs that will further encourage more exports.
3. The Department of Energy and the entire power sector must join hands in finding ways to reduce cost of energy in order to make the country’s export more competitive not only in terms of quality but price-wise.
4. The government should consider increasing the export budget through different incentives that will enable the exporters to produce more; thereby raise RGDP growth.
5. The national government may consider the possibility of letting the Philippines join trade preferential partnerships or the so called mega trade.
6. Further studies on other factors that affect exports and RGDP in the Philippines could be undertaken to provide a broader understanding of the dynamics of exports in the country.

References
[10]. www. IBON. com

Author Profile
Edgar H. Mendoza: received the B.S. in Business Administration major in Business Economics at Batangas State University (2007-2011) and Master of Arts. degrees in Economics from Polytechnic University of the Philippines (2012-2014). During 2011-2015, he stayed as College Instructor at Batangas State University. He studied also Leadership and Social Entrepreneurship at Dubai, United Arab Emirates in partnership with Ateneo School of Government through their extension program. He is now a content writer and aspiring entrepreneur.