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Impact of Exports on Economic Growth- A Case of Luxemburg

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Abstract: The key purpose of this article is to analyze the significant impact of Exports, Government expenditures and Education expenditures on the economic growth of the developed economy of the Luxemburg, which is the member state of the EU: the biggest exporter in the world. The span of time is from the year 1975 to 2009 on yearly basis with total no. of observations of 35. Present analysis is based on the simple ordinary least square method to indentify the important linkage between the export and the growth considering the economy of Luxemburg. Experimental results reveal a significant positive relationship of exports, government spending, educational expenditure, on growth of the economy. Export shows that one unit increase in the export cause a positive change of .17 in the economic growth. In the same way government, exp. and education exp. show a coefficient of 2.67 and 9.93 with positive sign. This article identifies the association between the export and the economic growth with respect to Luxemburg.

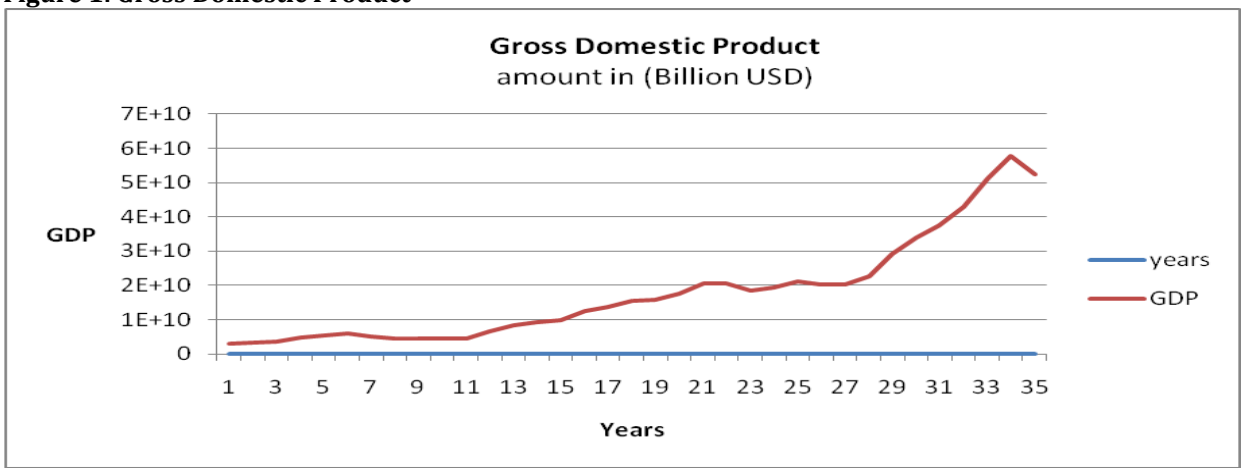
Key words: *Government exp. Growth, Export, Luxemburg, Ordinary least Square*

1. Introduction

Internationalization of the trade has its significant impact on the growth of the economy. Economic prosperity and progress depends heavily upon the export of the country. As the excessive production of goods and services are sent abroad to earn the foreign exchange which also in return provides more opportunities for employment, economy of the scale and finally broaden the competition among the various nations (Bhagwati & Srinvasan, 1979). All these industrial countries achieve remarkable growth and return on investment through the expansion of their domestic market to the international markets. Meanwhile the concept of internationalization has enhanced the competition among the various nations and several trade groups for which the question of best offerings arise. Pradhan (2010) on the views that less exporting countries have low economic growth while more exporting countries get better opportunies for development of their economy and so called the developed economies.

Present research work refers to the Luxemburg that is an exceedingly developed economy. According to the IMF report 2010, Luxemburg has achieved 3rd position in GDP per capita in rest of the world. Achieving a position of 68th in the global export ranking, it has major exports with the Germany, UK, USA, France, Belgium and other European and Asian countries. It is also at the ranking of 24th in the global economy for Human Development Index (HDI). According to the World Life Quality Index (WLQI) 2005, Luxemburg has ranking at the 4th position, but leader in the EU. According to the Purchasing Power Parity (PPP), Luxemburg is at ranking of 97 with rest of the world. It has major export with the Germany, which is about 26% of its GDP. Industrial sector at the beginning just consisted of steel and its related items. Now is diversified into chemicals, rubber and other related products. However, the economic trends have been significantly changing since from the last decade. After the global financial crisis 2008-09, the economic downfall also moved to Luxemburg and impelled the Government to make investment in the banking sector due to which the budget deficit up to 5% in 2009. Presently its economy is based on the financial sector, which contributes about 28% of GDP. The economic growth in term of GDP since from the Year 1975 to 2009 is publicized with the incessant growth is shown blow.

Figure 1: Gross Domestic Product



Present research work refers to analyze the effect of export on the financial growth of the Luxemburg by using the OLS methodology from the year 1975-2009. The purpose is to describe the association between the economic growth and the export by keeping the GDP as the dependent variable and export, government expenditure and education expenditures as the independent variables. The remainder part of this paper is structured as follows: next portion explain the literature review, section 03 enlighten the data and methodology, and section 04 demonstrates the empirical findings and last portion includes conclusion and implication of the study.

2. Literature Review

Exports and Economic Growth: As for the era of economic growth, the researchers present copious literatures. Financial development directly related to the economic growth that is positively effected by the exports of the country (Akram et al., 2011). Foreign trade and financial liberalization enhance the production process efficiency and positively effected the economic growth, described by (Demetraiades & Luitel, 1996; Bhattacharya & Sivasubramanian, 2003; & Tadesse, 2002). Frankel and Romer (1999) have on view that major elements that play their role in the economic growth are export and import. Expansion in the exports cause an increase in the economic growth (Michaely, 1977; Balassa, 1978; and Heller & Porter, 1978), while at the same time import augmentation put a negative impact on the economic growth of the country (Nandi & Kumar 2005). The other researcher that improvement in the infrastructure, employment rate is due to the expansion in the exports (Tyler, 1981 & Krueger, 1980) has expressed similar arguments.

The linkage between exports and economic growth is vital in view of many other researchers. As stated by Bhagwati and Srinvasan (1979) that exports lift the economic growth by utilization of economy of the scale, broaden the competition for productivity. While achieving the economy of the scale through the growth of exports, receiving this benefit over the longer period, a country must have to invest significant funds in research and development for serving the market with innovative products. Barro (1991) & Mankiw (1995) have the same idea that research and development (R&D) contributes a lot towards the economic growth. Serving the market at international level with the innovative products and services through latest techniques of production processes, knowledge and skills is very much crucial. As the global economy change day by day, so to serve it with innovative products is very much important. Technology and innovations are the two other factors that are essential for the expansion of the exports. Edward (1992) has described the facts that superior growth in the exports is owing to the innovative and range of product lines.

Apart from the above discussion various other variables are still exists in the economy, which causes instability in the export level. Lim (1976) described that export volatility is because of fluctuation in the price level, exchange rates, trade agreements, and financial developments that resulted in rise of demand in imported goods and turn down in the economic growth. Government expenditures are the spending by the government for the purpose of infrastructure enhancement, public welfare, and pension provision. Various

researchers have their view that government expenditures have positive impact on the growth of the economy. As government spends, more on the development of the infrastructure ultimately result in significant productivity (Aschauer, 1988). Some others on the view that privileged economic growth is because of higher government expenditures as the underprivileged part of the community obtain benefits (Anand & Ravallion, 1993). While Qureshi (2008) narrated that countries as Pakistan has a weak relation of public expenditure with economic growth (EG).

Education expenditures are also very much important in relation to the economic growth. Jung and Thorcecke (2003) stated that education expenditure lift up the rate of economic growth. Wang (1996) described the contribution of education expenditure in the economic growth as economic contribution rate of education (ECRE), which means one unit investment in the education expenditures cause an increase in the GDP (E.G). Long run economic growth is positively link with the long-term education expenditures (Zhu et al, 2008). Others have the idea that investment in the human capital in the form of education and health both has a significant impact on the growth of the economy. Uneducated Labor force results in unemployment that ultimately causes a serious downfall in economic growth (Li & Haung, 2008). Education as a main factor of human development is vital in many others judgment (Romer, 1990 & Barro, 1991).

Empirical Literature Review: Contemporary and earlier research studies have proved no incredulity in relationship between the exports and economic growth. Export led to economic growth in all countries like develop or developing. Pradhan (2010) from the Indian perspective described that there is long run stability between the exports, financial development and the economic growth and the future expectations are also correlated to the situation. Akram, khan, Atif & shafique (2011) shared the same idea in the perspective of Canadian economy stating the positive association between export and economic growth. Below is the table, which enlightens the relationship between export and economic growth. Most of the researchers conclude a positive relation, while some have the negative linkage between both of these.

Table 1: Exports, government expenditures and education expenditures relationship with economic growth (EG), revealed by foremost studies

Variables	Positive relations	Negative Relations	Insignificant Relations
Exports and EG	Akram, Khan, Atif, and Shafique (2011), Pradhan (2011), Calderon and Liu(2003), Beck et.al(2000), Chandra (2002), Amit and Mallick (2005), Heller and Porter(1978)		
Government expenditure and EG	Akram, khan, atif, and shafique (2011), Qureshi (2008), Anand and Ravallion (1993)		
Education expenditure and EG	Zhu et. al, (2008), Thorcecke (2003), Wang (1996)		

3. Methodology

Data and Variables: The statistics allied with the present research work is collected from the official website of world Bank known as World Development Indicator (WDI), taking into account the major explanatory variables like exports, government expenditure, education expenditure and GDP as dependent variable. The time span is from the year 1975 to 2009 with total 35 annual years of observations.

Variables of the Study

Exports: The term exports refer to as the goods or services being offered by a home country to a foreign country. For the economic development of a country, export plays an imperative function and finally contributes in achieving the long-term objectives. As narrated by Bhatwati and Srinvasan (1979) & Kruger (1980) the ultimate development of infrastructure, increase in employment rate, saving in production cost due to bunch production: economy of scale, is because of the enhancement of export. Moreover, the endogenous growth theory supports the argument that long-term growth is through by export. Advancement

in the shape of the technology, effective production process and R&D will direct to the economic growth, and finally development of human capital (Grossman & Helpman, 1991). Furthermore, Pradhan (2010) conclude that countries that are efficient in the international trade more rapidly achieve the economic growth as compared to less efficient countries in foreign trade. Various other researcher of the view that increases in the exports will lead to economic growth (Heller & Porter, 1978). Meanwhile the increase in the import finally elevates the government expenditure (Nandi & Kumar, 2005). Major driving force behind the economic prosperity and financial growth for developed nation is international trade because it provides them more opportunies to incarcerate new markets and capturing market shares. Looking to above literature the researcher postulate the hypothesis that export positively effects the economic growth and we are expecting the same result. The proxy used for the export in present study is in current (US$).

Government Expenditure: The sole purpose behind the government expenditures is to enhance the per capita income, which is considered an indicator for the economic growth (Akram et al. (2011) and Devarajan et.al 1996). For achieving long-term objectives like improvement of infrastructure, community development, human capital enhancement government expenditures are of the attention. As the government made significant investment in the non-military structure akin to highways, roads and sewers, ultimately leads towards the productivity in term of economic growth Aschauer (1989). Barro (1991) finds out a positive relationship between the public expenditures and growth rate. Devarajan et.al (1996) described that productive government expenditures supply superior growth in the economy. At the same time combination of public investment expenditures escort to the stable growth rate. Annand & Ravallion, (1993) stated that the integral part in a country is human resource and dealing with these resources in term of significant investment will in go back in economic growth. Looking into the above literature findings the researchers hypothesized that economic growth is positively effected by the government expenditures and we are expecting the same research outcomes. The proxy use for the government expenditure is in current (US$).

Education Expenditures: Education expenditures are also very much essential in the economic growth. These expenditures refer to expenditures, which are done for improving the skills and knowledge of the labor force in the economy. Tanzi & Chu (1998) argue that the education expenditures improve the growth rate of the economy with the equity as well. The portion of the government expenditures of education development contributes the growth of the country (Jung & Thorcecke 2003). As described earlier that numerous studies focus on the education as the most important determinant for the economic growth (Romer, 1990 & Barro, 1991). In order to test the common opinion in relation to education and economic growth researcher propose that education exp. has positive relation with the economic growth. In the present research work same verdict is consider to be find out. The proxy used for education exp. is current (US$). The dependent variable in the model is the GDP in current (US$).

Model Formulation: Primary aim of this paper is to examine the effect of export, government expenditure and education expenditure on the economic growth of the Luxemburg's economy. In the present study, simple linear regression analysis has been used to identify the significant importance of export towards the economic growth. For this purpose of analyzing the effect of export on economic growth, the following regression equation is developed.

$$\mathbf{Y\ (EG)}_{i,t} = \beta_0 + \beta_1\ \mathbf{(Expt)}_{i,t} + \beta_2\ \mathbf{(GOVT.EXP)}_{i,t} + \beta_3\ \mathbf{(E.EXP)}_{i,t} + \mathbf{e}$$

Where,

EG (The dependent variable)	= Economic growth of Luxemburg at a particular time period t
Expt.	= Export of the Luxemburg at a particular time period t
Govt. Expt	= Government expenditure of Luxemburg at a time period t
E.EXP	= Educational expenditure of Luxemburg at a time period t
$\beta_0, \beta_1, \beta_2, \beta_3$	= The regression coefficients
e	= The Error term

4. Results

Below are the empirical findings of the model with their level of significance and diagnostic tests, which are applied to the data.

Table 2: linkage of export with government expenditure, education expenditure and economic growth

Variables	Co-efficient	Standard Error	P-value
GDP	---	---	---
Export	0.17	0.02	2.02*
Govt. exp	2.67	0.39	1.33*
Edu. Exp	9.93	1.69	1.92*
Intercept	3.66	2.54	0.16
R- square	0.87		
Adjusted	0.86		
Diagnostic test (breusch Pagan)	.1547*		
Durbin Watson test	1.72(32,3)		

**significant at 5%*

Table 2 reveals the result findings of regression analysis from the year 1975 to 2009. The first explanatory variable Export (Exp) explains coefficient value of 0.17. It just says that one $ change in export causes a change of 0.17 times in dependent variable (economic growth). The P-value shows significant results at 5%.Generally social sciences use 5% significance level it means we can say with 95% assurance that export contributes in economic growth. Meanwhile, second independent variable (government expenditure) with the slope coefficient of 2.67 demonstrates that one unit change in GE would direct to 2.67 times change in economic growth (EG). Second Independent variable is significant at 05% level.

R-Square illustrates the explanatory power of model that means that how much variation is explained by the independent variables in the dependent variable. Our model explains 87% variations. The adjusted R-Square is enclosing the value of 0.86 percent. For detecting the heteroskedasticity: relationship between the independent variables and error terms, Breusch Pagan test is applied. The value of BP test shows Probability of 0.154. That means our H_o of constant variance is rejected at 5% level of significance. Therefore, we can conclude with confidence level of 95% that there is no heteroskedasticity in the model. To detect the multicollinearity: relationship between the independent variables in the model, we used PP-Plot. This problem exists in the model. Therefore, to remove the multicollinearity we take the third difference of exports and again run the regression among the variables. The resulted outcomes shows that approximately all the variables in the model are now free from multicollinearity. Finally for detecting the correlation: the relationship between the error terms in the model, applied Durbin Watson (DW) test shows the value of 1.72. Through this value, we come across that there is no auto correlation exists among the errors.

5. Conclusion and Policy Implications

This study explores the idea that how much exports leads to economic growth. The results reveal that there is long run equilibrium relationship between trade and economic growth during the period 1974 to 2009 by using the OLS technique, considering the Luxemburg economy. Our results state that export has a significant positive relation with the economic growth (EG) which is entirely relevant to the previous research findings.
The economy of the Luxemburg has to face repercussion of the global financial crisis in 2008-09 in the form of unemployment, which is major challenge for it. To cope with this challenge the government should expand its export portfolio to the developing countries. It should diversify its economy to financial sectors, which will lead to financial development. As the new states are becoming member of EU, so the level of competition is enhancing progressively. To overcome this trouble it must have to serve the Euro Zone with the innovative products and services. To concludes, an enhanced economic growth is dependable for internationalization of trade and financial development in the country. This is quite evident that as with enhanced economic growth, the country opts for internationalization of trade and financial improvement. Based on the empirical findings it is suggested that Luxemburg should go more for trade expansion for economic growth

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