



Does the export sector generate positive externality for the non-tradable sector? The case of Bangladesh, India & Pakistan.

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Abstract:

Pakistan, India and Bangladesh are part of the developing countries in the world. These countries are continuously working hard and discovering different alternates to overcome its problems. The main objective of these south Asian countries is to stand among those countries which are considered to be developed. In my thesis I am pursuing trade as my main subject. Export is extensive issue and can affect the economy of any country in many ways. In trade I will opt for that portion, which is playing vital role in Pakistan, India and Bangladesh's economy and affecting the economy in a severe way. I decided to focus on the two sector model to know about productivity differential between the export and non export sectors of these countries. To find out how much export, labor and investment contributes to gross domestic product within the period of 1962-2016 for Pakistan and India and 1971-2016 for Bangladesh. After working on these matter I reached to my results and I found that productivity differential between the export and non-export sectors is positive and statistically significant. I also concluded that labor force, weighted export and investment to GDP contribute positively to economic growth in these countries.

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1. Introduction:

South Asian countries like Pakistan, India and Bangladesh are the developing countries in the world. These countries are continuously striving to improve their economic condition and reduce poverty. To improve their economy these countries have adopted many different programs but could not find any appropriate way to reduce poverty and to improve their economic growth. Due to this reason the governments of these countries have tried to find a relationship between economic growth and export growth and as a result they found that if the country's export increases, it does not necessarily mean that economic growth will also increase. Additionally, there is a possibility that a country's poverty can be reduced. Profit might be increase when a country has growth in exports. Growth in exports could be possible when a country utilizes its optimal resources and ultimate output [Khan and Saqib, (1993)].

Developed countries that have experienced maximum profit had adopted trade as their major sector. Countries that improved their manufactures export have dynamically shown economic progress which leads these countries to be considered as the most developed countries in the world. Due to export, the development of the country can be improved, so that it can eliminate its poverty and improve its economic conditions [Deininger and Squire, (1996)]. Now the question arises in many economists' mind that what type of export policies should be used? or whether trade should be free or not? There should be no barriers of trade policies as most economists believe; there should be free trade. Any country can trade any product to any one without restrictions. Trade procedures should be simple. Many of these economists referred this freedom of trade as the key toward economic growth. Most of economists are in the favor of free trade, but there is still disagreement among the economists. Even those who are in favor of free trade are concerned about the practical implementation of free trade. They believe that there should be some limitation for trade otherwise it creates some economic disturbances. However, still most economists would agree with Harry G. Johnson that "The proposition that freedom of trade is, on the whole, economically more beneficial than protection is one of the most fundamental propositions economic theory has to offer" [Blendon, Robert J. et al., (1997)].

Free trade means that there is no limitation for trade; a country can trade freely without any regulations. Free trade might boost up an economy or stimulate economic growth. With free trade an economy could experience growth quickly without any hurdles. However, it is not possible if we keep on exporting the same products and using the same technologies. A unified product might not be able to improve our export. If a country wants to expand its exports, then the country should use new technology and improve the quality of manufacturing products. There should be some variety of products. To achieve this expansion, the country has to decide whether invest in money form or in their labors. Both options are beneficial for the exports [Devereux, (1997)]. On the other hand, it is more beneficial if a country has proper understandings of exports, because sometimes relations with other countries help countries to improve their exports. Positive relations among countries can support in many different ways without having to involve themselves in other countries problems. This positive relation provides external capital and use of external technology which stimulate the growth of the country. It is not only positive foreign terms and relations that could help the country, but also other factors are important. The country might have to improve its own inputs, machineries, equipment and labor. It might be difficult for the country to stimulate its growth, if the country does not rely on

other factors of production. Moreover, to improve the country's economic growth, foreign relations and factors of production both are relatively important [Nishimizu and Robinson, (1984)]. International trade can be considered as the better route towards economic growth. It helps to hasten the speed of a country's progress towards development. International trade can also be considered as a path that might assist the economy towards development. Trade might be used as the engine of growth, which helps the economy to accelerate its speed towards growth. Before the concept of international trade, there were barriers of trade between different countries with the help of different methods such as restrictive quotas, tariffs on imported goods and different government regulations. There was no concept of liberalization; thinking of liberalization of trade was considered to be dream. In addition to it some analysts believe that protectionism could help in economic achievements [Edwards, (1993)].

Many of the economists realized that previously they were tied to policies so they changed their approaches and accepted the concept of liberalization. Moreover, liberalization has used by economists as the one of the basic tools to achieve growth. Hence, collected evidence also shows that there is positive relation between growth and liberalization for developing countries, for example Burma, Nepal, Hong Kong, Singapore, and Taiwan. These countries grew rapidly due to exports. In contrast, the Philippines, Sri Lanka, and Pakistan all experienced annual rates of growth of per capita income of less than 3 percent, and had falling shares of exports in GNP [Krueger, (1990)].

This later example made it clear that expansion of growth might not only be dependent on foreign countries relations, which is called outward orientation. Therefore, simply relying on outward orientation is not suitable for less developed countries. Less developed countries should create a balance between outward orientation and their factors of production [Hotchkiss, Moore, Rockel, (1994)].

Growth is the major concern of countries and in order to improve their growth, countries usually focus on their export. Even developed countries might find export promotion policies as the good alternative to stimulate growth. With the assistance of trade promotion policies, any country could expand their trade. Promotion polices could be considered as an incentive program design to attract more firms into export. Moreover, by adopting export promotion policies, firms could receive help in product and market identification, pre shipment financing, training, payment guarantee, trade visits, and foreign representation. However, by applying promotion policies, countries could experience the interconnection between trade and growth [Holman, Graves, (1995)]. Moreover, the issue of productivity in the export sectors has implications for the non-export sector in terms of externalities that the export sector generates. For instance, a high productivity in the export sector is only possible if the investment climate is supported by a well-developed infrastructure, skilled labor force and investment policies, and access to modern technologies and expertise. These are likely to, both directly and indirectly, benefit the non-export sector.

1.1 Purpose of the Study:

This thesis focuses on trade with the following main questions. These questions: Does the export sector generate a positive production externality for the non-tradable goods sectors? And whether the productivity in the export sector is higher than in the non-tradable sector or not? I would focus on these questions and try to find the results that would help to analyze the externalities effect and factor of productivity in the case of Bangladesh, India and Pakistan.

Productivity refers to the output per capital employed and output per worker involved in the process of production. In my framework the production differential implies the difference between export and non export sectors productivity.

In addition, the productivity of export sectors has an effect on non export sectors in term of externalities. Any change in export sector could bring a change in non export sector either directly or in indirectly. For instance the export productivity could only enhance if there is investment. Moreover, if the investment climate is well organized, has the proper infrastructure, has well-trained and skilled labors, well developed technologies and expertise and proper investment policies. These condition directly or indirectly also likely to affect and give benefit to non-export sector.

Productivity of export sector might not only benefit to growth but it also might help to reduce inefficiency and create awareness. There are possibilities that because of export competition might create among foreign countries. Along with it export might bring efficiency in labors and motivation to work diligently. Due to competition country has to produce good quality and good quantity of product. Which might lead to increase the capital and also advances technology .This increase in export could bring affect on many other factors [Jung and Marshall, (1985)].

2. Background:

In this section I emphasis the background of Bangladesh, India and Pakistan's economy by focusing on trade. I observe how trade plays a vital role in the past economy by examining different past periods.

2.1 Bangladesh

After Independence Bangladesh brought trade reforms in their liberalization policy. In 1990 they accelerated the trade reforms which helped them to achieve dynamic improvement in the economic growth and also in the external sector. This improvement was far better than the post reform period. The average growth rate of GDP increased from 4.1% during 1980–1991 to 5.0% during 1991–2001.

In 1990's major growth was taken places in industrial sector. However agriculture sector and service sector also shown positive growth. In 1981-1991 the growth was just 5.2% which

reached to 7.3% in 1991-2001. The same year gross domestic saving and capital formation also showed improvement.

In 1991-2001 not only economic growth has improved but international trade also shown substantial improvement. Both export and import increased, the export increased at 13.2% per annum in 1991-2001 which was just 8.4% in 1981-1991. Import also reached to 10.4% per annum from 6.6% in this time period. This economic growth of Bangladesh was the highest among all three south Asian countries [Parida and Sahoo, (2007)].

2.2 India

India adopted a liberalization process in early 1980s. However India got fully command on economic reforms with the rest of the world after the balance of payment crises in 1991. The GDP growth was 5.6% in 1981-1991 and it rose to 6.1% in 1991-2001. The higher growth was marked in service sector and agriculture sector had also shown some marginal improvement. The growth took place in 1991-2001 in service sector was 8.1% which was 6.9% in 1981-1999. In this time period external sectors also achieved gain. Export, current account, capital account, foreign exchange reserves shown great growth as compare to previous years.

Export reached to 13.6% which was only 6.8% in 1981-1991. Due to invisible account and exports, current account also turned into surplus in 2001. After 2000, the balance of payment of India showed surplus as a result of this there was a large inflow in the current account, capital account and foreign capital [Parida and Sahoo, (2007)].

2.3 Pakistan

In south Asia, Pakistan is considered as the second largest economy. In 1952 Pakistan went through a serious export crisis, and therefore it had to face a decline in export earnings. During that time period, Pakistan took a rigid decision and decided not to devalue its currency. In addition, Pakistan adopted a firm set of quantitative controls on imports such as multiple exchange rates for imports and other exchange-based imports taxes and subsidies, advanced import deposit requirements, various administrative measures and ad hoc restrictions on provision of foreign exchange for imports reflected in external payment liabilities. However, these quantitative controls on imports enable Pakistan to receive the same amount of payment on export goods. Moreover, with the help of these quantitative controls Pakistan attained progress in its trade. After overcoming these crises, the Pakistan export sector was booming. At that time Pakistan got mainly earnings from the agriculture sector, on the other hand manufacturing sector was still growing. For supporting manufacturing sector Pakistan government put some restrictions on imports in order to enhance its domestic production. The restrictions were tariffs, export taxes and quantitative control on imports. These measures responded marvelously and due to constant control Pakistan domestic industry faced noticeably high profit. During the period of 1950 to 1960 Pakistan faced a remarkable achievement in the manufacturing sector by increasing 12 to 15 percent in domestic manufacturing products. On the other hand, Pakistan's government

also took a step in favor of the industrial sector. The government decided to discourage industrial imports and replace it with domestic products. In the 1950's there was a significant import substitution, therefore many new industries also started to export which enhanced the Pakistan's trade [Lewis, (1968)].

During the period of 1979 till 1985 economy of Pakistan flourished a lot because of export diversification. The export diversification benefited the Pakistan economy to a great extent but in the end of 1985 there were some political instability. Due to political instability, Pakistan faced its worst era, and its export diversification declined to a minimum. To overcome the decline in exports Pakistan adopted free trade and diverted towards structural change. Structural changes brought noticeable results, however there was a decline in exports, but some new primary product also grew, for example textile yarn and thread, leather, cotton and rice [Akbar and Naqvi, (2000)]. In 2001, Pakistan exports had increased, and amounted to 21.5 billion US dollars. In the period of 2000-2001 Pakistan also increased the production of manufactured goods. On the other hand there was a decline in semi manufactured products. Pakistan imports became limited to petroleum, iron, equipment, machinery, edible oils and steel. In 2007, Pakistan exports again increased and it amounted to 47.7 billion US dollars, and the annual increment was 18 percent. [Trade Policy Review, (2008)].

3. Literature Review:

This chapter presents different studies of export and also shows the relationship between export and economic growth. Different studies could help to understand relationship between export and economic growth.

Tyler (1981) emphasized the relationship between export performance and GNP growth. His literature and empirical evidence have shown that a country that ignores exports has to face a lower rate of economic growth. Furthermore, he discouraged those economic policies that are unfavorable for exports. In his view, economic growth could not be attained without focusing on exports. Therefore, he suggested avoiding unfavorable economic policies that discouraged exports. He further suggested establishing such economic policies that provide appropriate prices for export goods and making different incentives and benefits for exporters. Appropriate economic policies encourage the exporters to export more so that a country could progress towards development. Exports could play a vital role for economic growth and therefore developing countries should enhance their exports. There are many developing countries that are following those economic policies which are unfavorable for export. In order to attain a prominent place in the world, developing countries have to develop their export sector. Export could be an appropriate way toward achieving a higher rate of growth.

Streeten (1982) has carried out numerous studies that have found a relationship between export and economic growth. In this regard, his paper has taken export as the driving force which accelerates economic performance of developing countries. His study has also shown a positive

relationship between export and non-economic export growth rate. The non-economic export growth includes a variety of products and volume of export, rate of change in per capita output and rate of change in the proportion of export in national products. The relationship between export and non-economic export growth rate has been shown and it became evidence that export hasten the economic performance.

Hotchkiss, Moore and Rockel (1994) have shown the different contribution of export in low and middle income countries. According to them, expansion of export has brought growth in less developed countries. Moreover, they have shown that the change in the growth is due to productivity of factors. The low income countries have also expanded their export but their contribution of export expansion is less as compared to middle income countries. Middle income countries have a greater contribution of export expansion because they have benefited from positive externalities. On the other hand, low income countries do not have the benefit of positive externalities. Both the countries have trade expansion of different magnitudes but the difference in the magnitude of trade expansion of low and middle income countries is not too large so that it can be estimated separately.

Frankel and Romer (1999) have focused on the question that how standard of living gets affected by international trade. Although this question is old and it is a hard to answer. Exogenously no one could determine the trade done by any country, because of this reason, the affect of trade could not identify the correlations between trade and income. In paper this problem is discussed by concentrating on the component of trade. Frankel and Romer have taken geographic factor as a main component of trade. Geographic factor is one of the main reason by which country has to trade more. As the population increases, the country has to fulfill demand of population. In order to fulfill their demand, countries have to export more. Countries that export from their neighboring or nearby country have more benefits as compared to those who exported from far away countries. Government policies might not affect the geographic factors, but geographic factors might be affected because of interaction with residents of other countries. The relationship between trade and income shows that if there is a one percent point rise in the ratio of trade to GDP, it means an increase in income per person by at least one-half percent. Trade could help to increase the level of income by encouraging the accumulation of human and physical capital by increasing output for given levels of capital. Moreover, increasing output reflects that the international trade could raise the wealth.

Ibrahim and Macphee (2003) in their paper, they updated the estimates of the relationship between export and GDP growth with the help of the model developed by Feder. They mostly focused on the impact of stationary variables on the time series estimates. They estimated the model with and without the co-integration and non-stationary variables. As a result of adjusted estimates they suggested that in more than half of the countries there is a positive export productivity differential and positive export externalities. Moreover, they have suggested using simultaneous equations to determine export externalities to deal with the problems related to export externalities. They have also shown the affect of export on growth with the help of

simultaneous equations. According to the result of their studies, they have shown that higher productivity in the export sector depends upon the size of the country and its trade. Higher productivity also depends on the manufacturing sector of the country. They also suggested that a country might not only depend on primary products because externality affects decline. To avoid decline in externality affect, they have suggested that adopting diversity in products. On the other hand, strong highly processed export products generate positive externality for non-export sectors.

Kali, Méndez & Reyes (2007) discussed after many studies and evidence that many people believed there is a direct relationship between the economic growth and exports. If any county increases its exports, eventually they bring an increase in foreign exchange and demand of more output. Demand of more output implies that there is a growth in the economy. The authors have also focused on volume of trade in their literature. Volume of export plays an important role in growth. According to them, some people believe that the greater volume of exports, more growth a country has. Yet believing in all these factors people forget to focus on the trading partners. More trading partners automatically results in more output. However, in order to fulfill the demand of more exports, the volume of trade needs to increase. They also emphasized that trade partners are correlated to economic growth. Therefore by observing developed countries in the world, that has more trading partners, shows that they have extensive volume of trade. Moreover, developing countries could improve their volume of trade by having more trading partners.

4. Theoretical Interpretation:

I have examined the paper written by Hotchkiss, et al (1994). The second variant of the trade variable in the present study is based on Feder's (1983) model. I could capture trade contribution to growth by *sector-externality effect* and *factor productivity effect* with the help of Feder's model. Sector externality effect measures the positive externality of the export sector on the non-tradable good sector. The factor productivity effect measures the gain due to the higher productivity of factors. In the export sector when the factor productivity affect is positive and significant than optimal resources are allocated to the export sector. In this chapter I will work on my model and later on using this model I generate my result. The generated outcomes would help to conclude about the export externality effect and productivity effect on growth of Pakistan.

Following assumptions would be considered in this model: There are two sectors an export sector and non-tradable sector. Output of non-tradable sectors is considered to be equal to N and of export sector output is equal to be X. GDP is equal to Y and GDP is referred to be the sum of output of each sector, so it can be shown as:

$$Y=N+X \quad (1)$$

Since the present analysis focuses on the potential non-optimality of resource allocation between export and non-export sectors, the economy viewed as if it consists of two distinct sectors: one producing export goods, and the other producing for the domestic market. Instead of an aggregate national production function, each of the two sectors' output is a function of the factors allocated to the sector. In addition, the output of the non-export sector is dependent on the volume of export produced.

Then we have production function X and N. We give Production function in such a way that X gives an externality function for N. Then:

$$N = F(K_n, L_n, X) \quad (2a)$$

$$X = G(K_x, L_x) \quad (2b)$$

Where, $K_n + K_x = K$ and $L_n + L_x = L$

Where K is capital and L is labor. K_n , is referred to be the capital used in non export sector and K_x is the capital used in export sector same goes for labor. L_n , is the labor used in non-export sector and L_x used in export sector. The subscripts on K and L are referring to sectors.

The dot will represent the change of the over struck variables. From equation (1)

$$\dot{Y} = \dot{N} + \dot{X} \quad (3)$$

Now let consider the subscripts on F and G as the marginal products with respect to subscribed input considering the total derivatives of (2a and 2b), letting $I=K$ and substituting into equation (3).

$$\dot{Y} = F_K \dot{I}_n + F_L \dot{L}_n + F_X \dot{X} + G_K \dot{I}_x + G_L \dot{L}_x \quad (4)$$

Where I_n and I_x are respective sectoral gross investments, \dot{L}_n and \dot{L}_x are sectoral changes in labor force. From above equation it can be noticed that the partial derivatives of F with respect to X. (F_X) has taken the sector externality effect of export expansion and it is calculating the positive externalities export sector on the non-export sector.

Suppose there is no equality between the respective marginal products of both sectors.

$$\text{Let, } G_K = (1+\delta) F_K \text{ and } G_L = (1+\delta) F_L \quad (5)$$

Here δ allows capturing the factor productivity effect, which measures the gain due to the higher productivity of factors in the export sector. From equation (5) substitute G_K and G_L in equation (4) so equation (4) becomes

$$\dot{Y} = F_K \dot{I}_n + F_L \dot{L}_n + F_X \dot{X} + (1+\delta) F_K \dot{I}_x + (1+\delta) F_L \dot{L}_x \quad (6)$$

By combining term equation (6) we get,

$$\dot{Y} = F_K I + F_L L \dot{x} + F_X \dot{X} + \delta (F_K I x + F_L \dot{L} x) \quad (7)$$

Knowing that the data is only available for dependent variable and for first three right hand side (RHS) variables but for last two RHS variables data is not available. For this reason an alternative equation is derived to explain the last two terms in the above equation. By taking the total differentiation of equation 2b then we get:

$$\dot{X} = G_K I x + G_L \dot{L} x \quad (8)$$

Substituting the values of GK and GL from equation (5) in equation (8) to get equation 9:

$$\frac{\dot{X}}{(1+\delta)} = F_K I x + F_L \dot{L} x \quad (9)$$

Notice that the last two term of equation (7) are same as the RHS of equation (9) so we could substitute equation (9) into equation (7) and then simplify it:

$$\dot{Y} = F_K I + F_L [F_X + (\frac{\delta}{1+\delta})] \dot{X} \quad (10)$$

Let $F_K = \alpha$ and $F_L = \beta (Y/L)$, this implies that there is a linear relationship between marginal product of labor and the average output of labor in the economy. Substitute the values of F_K and F_L in equation (10) and divides with Y to get the equation (11):

$$\left(\frac{\dot{Y}}{Y}\right) = r + \alpha_I \left(\frac{I}{Y}\right) + \beta_I \left(\frac{\dot{L}}{L}\right) + [F_X + (\frac{\delta}{1+\delta})] \left(\frac{\dot{X}}{Y}\right) \quad (11)$$

Here the parameter γ is showing the whole bracket expression, to proceed towards (\dot{X}/Y) . It would be kept in notice that the parameter estimated for export variable represents both effects that are *sector externality effect* (F_X) along with it *factor productivity effect* (δ). Now we can represent equation (11) as:

$$\left(\frac{\dot{Y}}{Y}\right) = r_1 + \alpha_I \left(\frac{I}{Y}\right) + \beta_I \left(\frac{\dot{L}}{L}\right) + \gamma_I \left(\frac{\dot{X}}{Y}\right) + \varepsilon \quad (12)$$

Equation (12) is the first regression model. Estimation of the first model would provide information on how the magnitude of the contribution of export expansion to growth.

Hence in above equation (12) the subscript t represents the time period, Y is the GDP so \dot{Y}/Y is its annualized growth rate; I is gross domestic investment for the period; L is labor (population), so \dot{L}/L is the annualized growth rate of labor; and X is exports, so \dot{X}/Y is the simplifies form of the annualized growth rate of exports weighted by the proportion of exports and GNP (that is, $\dot{X}/Y = ((\dot{X}/X)(X/Y))$). r_1 is the intercept and is interpreted as the underlying rate of growth Y. The α_1 is the marginal productivity of capital in the non-export sector, β_1 represents labor force

growth and γ_1 represents the test for the hypothesis that marginal productivities in the export sector are higher, and given that exports generate beneficial externalities.

Specifying the externality effect:

So far we were not able to decompose the factor productivity differential γ into its components. One can identify the specific inter-sectoral externality effect by adopting a plausible specification for the term F_x . Suppose that export's affect the production of non-export with constant elasticity i.e.

$$N = F(K, L, X) = X^\theta \Psi(K, L) \quad (14)$$

Now we take the partial derivative of F with respect to X, Utilizing $N = Y - X$.

$$\frac{\partial N}{\partial X} = F_x = \theta \left(\frac{N}{X}\right) = \theta \frac{Y}{X} - \theta \quad (15)$$

Now substitute (14) into (11) to get the outcome

$$\frac{\dot{Y}}{Y} \alpha \left(\frac{I}{Y}\right) + \beta \left(\frac{\dot{L}}{L}\right) + \left[\frac{\delta}{(1+\delta)} - \theta\right] \left(\frac{\dot{X}}{Y}\right) + \theta \left(\frac{\dot{X}}{X}\right) \quad (16)$$

Where the parameter ϕ represents the entire bracketed expression preceding (\dot{X}/Y) . We can write equation (15) as:

$$\left(\frac{\dot{Y}}{Y}\right) = r + \alpha_1 \left(\frac{I}{Y}\right) + \beta_1 \left(\frac{\dot{L}}{L}\right) + \phi_1 \left(\frac{\dot{X}}{Y}\right) + \theta_1 \left(\frac{\dot{X}}{X}\right) + \varepsilon \quad (17)$$

Equation (17) is the second version of the model, allows for the separation of the two effects. All the variables used in equation (12) are defined except of annualized growth rate of exports (un-weighted). The parameters α_1 , β_1 are interpreted as in equation (12), though they are of course, are not constrained to have the same point of estimates. θ_1 is interpreted as the elasticity of output in the non-export sectors with respect to the level of exports and thus measure the sector-externality effects of exports. ϕ_1 is not interpreted the same way that γ_1 is in equation (12). The parameter ϕ_1 and θ_1 can be used to identify productivity differential effect δ . The δ can be computed as $\delta = (\phi_1 + \theta_1) / [1 - (\phi_1 + \theta_1)]$, so that $\delta = 0$ implies no productivity differential between the two sectors, $\delta > 0$ implies that the export sector is more productive than the non-export sectors, while $\delta < 0$ suggests that the export sector is less productive relative to the non-export sector [Gupta, (2011)].

4.1 Variables and Data:

Where Y, I, L and X represent output, investment (capital formation), labor and exports, respectively; a dot over the variables indicates the time-derivative of the corresponding variable. The data is extracted from the world development indicators (WDI). From this source we have used all the data of period between 1962-2016 for Pakistan and India. However for Bangladesh

the period of data is 1971-2016. For every variable (in 2010 constant price). Y is GDP so it is used to calculate a variable for annualized growth and this variable is dependent variable in the model, it is denoted by \dot{Y}/Y . I/Y represent investment to GDP ratio and data for gross domestic investment is currently described as Gross Capital Formation in World Development Indicators. Labor data is also used in the model, L is labor and it is used to calculate a variable annualized growth rate of labor \dot{L}/L . X is export and with the help of X share of export in GDP could be calculated and it represents as \dot{X}/Y . X is also used in a model as annualized growth of exports and it represents as \dot{X}/X .

5. Estimation Methods:

In this section, statistical methods for estimation are introduced. Furthermore, there will be discussion about the results. In order to find the parameters the Ordinary Least Squares (OLS) methodology will be used. The motivation behind using OLS is its statistical properties, as described in Gauss-Markov Theorem. [Greene, (2002)].

5.1. Steps of the analysis:

First, the assumptions of the OLS regression necessitate that disturbance term has zero mean and finite variance and variables should be stationary. Therefore, to check for the stationary, unit root test would be conducted for our time period. In presence of the non-stationary variables there might be spurious regression called by Granger and Newbold (1974). A spurious regression has high R-square, t-statistics that appear to be significant, but the results are without any economic meaning [Enders, (2009)]. Therefore, using OLS with non stationary time series variables would give result spurious results. Testing for unit root is also a pre-requisite to co-integration test.

Second, if series proved to be non-stationary in level data, which is the usually happen in case of time series, then series stationary could be made by taking their first differences and run the regression using differenced data series. However, first difference method throws away the information that could be interpreted from economic theory for having any long term relationship among the variables. Therefore, it is suggested that first difference method could not be used until the residuals are not tested for stationary. Empirically, it is proved that linear combination of non-stationary variables turn out to be stationary. It is due to long term relationship among time series variables [Enders, (2009)]. Moreover, In order to test the hypothesis that there exists long term relationship or equilibrium among the variables so the co-integration test would be conducted for the model. The co-integration test is only conducted in the case, if the variables turn out non stationary but in any case if the variables turn out stationary then there would be no need of co integration test.

Thirdly, after testing the variable that whether they are stationary or non-stationary, OLS method would be apply to estimate the coefficients of the variables. Whereas the estimation of the parameters would provide quantitative evidence and finally we analyze and interpret the estimated results.

5.2. Unit Root Test:

To identify that series are stationary or non-stationary we begin our analysis with the unit root test for each time series variable, which is also a condition to co-integration. The assumptions of the OLS regression necessitate that variables should be stationary. In presence of the non-stationary variables there might be spurious regression.

Usually, the time series are modeled as random walk process, where dependence between consecutive observation are expressed as follows,

$$Y_t = \rho Y_{t-1} + U_t \quad -1 \leq \rho \leq 1$$

Where U_t is a white noise error term. Y_t is the current value of time series variable. It is immediate previous value Y_{t-1} . If $\rho = 1$, that is in the case of the unit root, above equation becomes a random walk model. This is known to be as non-stationary stochastic process. Therefore, why not simply regress Y_t on its (one period) lagged value Y_{t-1} and find out if the estimated ρ is statistically equal to 1? If it is, then Y_t is non stationary. This is the general idea behind the unit root test of stationary [Gujrati, (2003)].

Subtract Y_{t-1} from both sides of above equation to obtain:

$$\begin{aligned} Y_t - Y_{t-1} &= \rho Y_{t-1} - Y_{t-1} + U_t \\ &= (\rho - 1) Y_{t-1} + U_t \end{aligned}$$

This can be alternatively written as:

$$\Delta Y_t = \Gamma Y_{t-1} + U_t$$

Where $\Gamma = (\rho - 1)$ and $\Gamma = 0$ corresponds to unit root. The null and the alternative hypotheses may be written as,

H0: $\Gamma = 0$ (Series has Unit Root)

H1: $\Gamma < 0$ (We reject the null hypothesis)

Using Augmented Dickey-Fuller test statistic each variable is tested in their level data for stationary to avoid any spurious regression. It would also help to identify integration order of time series. Table 1 presents the results for the unit root using Augmented Dickey-Fuller test statistic. Augmented Dickey-Fuller test represents that all variables are stationary that is $I(0)$. Table 1 is in level form therefore it is not rejecting null hypothesis.

Table 1. Unit Root Test Results:

Pakistan		ADF Test		Critical Values	
Variables	Statistics	Lags	5 Percent	10 Percent	
Annualized Growth (\dot{Y}/Y)	-4.808	0	-2.926	-2.598	
Gross Domestic Investment (I/Y)	-7.380	0	-2.926	-2.598	
Annualized Growth of Labor (\dot{L}/L)	-8.096	0	-2.926	-2.598	
Annualized Growth of Exports (\dot{X}/Y)	-7.335	0	-2.926	-2.598	
Annualized Growth of Exports (Un Weighted) (\dot{X}/X)	-7.624	0	-2.926	-2.598	
India		ADF Test		Critical Values	
Variables	Statistics	Lags	5 Percent	10 Percent	
Annualized Growth (\dot{Y}/Y)	-6.438	0	-2.926	-2.598	
Gross Domestic Investment (I/Y)	-7.499	0	-2.926	-2.598	
Annualized Growth of Labor (\dot{L}/L)	-6.538	0	-2.926	-2.598	
Annualized Growth of Exports (\dot{X}/Y)	-7.504	0	-2.926	-2.598	
Annualized Growth of Exports (Un Weighted) (\dot{X}/X)	-7.094	0	-2.926	-2.598	
Bangladesh		ADF Test		Critical Values	
Variables	Statistics	Lags	5 Percent	10 Percent	
Annualized Growth (\dot{Y}/Y)	-6.620	0	-2.944	-2.606	
Gross Domestic Investment (I/Y)	-6.405	0	-2.944	-2.606	
Annualized Growth of Labor (\dot{L}/L)	-5.801	0	-2.944	-2.606	
Annualized Growth of Exports (\dot{X}/Y)	-6.433	0	-2.944	-2.606	
Annualized Growth of Exports (Un Weighted) (\dot{X}/X)	-6.247	0	-2.944	-2.606	

- Bold numbers denote that they are significant at 1% level.

-Annualized Growth of Labor takes in 1st difference.

-In choosing lag length, automatic lag length selection (Schwarz) is used.

6. Result:

The evidence which obtained after unit root analysis shows that the variables have a long run relationship in the model. We have used regression for quantitative analysis by using ordinary least squares (OLS) method and showing its estimated result in table 2. Due to low error, t-statistic would increase and it would become significant [Verbeek, (2008)]. Now I will discuss both the models.

**Table 2. Ordinary least squares (OLS) Regression Results
Pakistan:**

Dependent Variable \hat{Y}/Y				
Model 1			Model 2	
Variables	Coefficients	t statistics	Coefficients	t statistics
Constant	2.388311	37.65	2.341293	32.25
I/Y	0.0461292	13.55	0.0456793	13.44
\dot{L}/Y	0.0974148	0.18	0.0974221	0.18
\dot{X}/Y	0.0009924	7.50	0.000968	7.29
\dot{X}/X	-	-	0.0281762	1.30
R-Squared	0.8299		0.8355	
Adjusted R-Squared	0.8199		0.8224	
Observation	55		55	

-All data is in log form.

India:

Dependent Variable \hat{Y}/Y				
Model 1			Model 2	
Variables	Coefficients	t statistics	Coefficients	t statistics
Constant	1.648723	18.97	1.700142	10.61
I/Y	0.641164	2.66	0.6221256	2.66
\dot{L}/Y	0.6956239	0.88	0.6311852	0.83
\dot{X}/Y	0.6275481	2.64	0.6463978	2.64
\dot{X}/X	-	-	0.0287093	0.38
R-Squared	0.2533		0.2555	
Adjusted R-Squared	0.2094		0.1959	
Observation	55		55	

-All data is in log form.

Bangladesh:

Dependent Variable \dot{Y}/Y				
Model 1			Model 2	
Variables	Coefficients	t statistics	Coefficients	t statistics
Constant	1.306176	15.79	1.312533	12.06
I/Y	0.397874	2.32	0.4012883	2.26
\dot{L}/Y	0.4979351	0.59	0.508507	0.59
\dot{X}/Y	0.4305104	2.40	0.4341436	2.33
\dot{X}/X	-	-	0.0042613	0.09
R-Squared	0.3221		0.3222	
Adjusted R-Squared	0.2736		0.2561	
Observation	46		46	

-All data is in log form.

Equation 12 (model1) and in equation 17 model (model 2) were estimated ordinary least squares (OLS). The result is shown in table 2. According to the empirical result of estimation model 1 there is a positive relationship between investment and growth in all three countries. In case of labor force, Bangladesh, Pakistan and India all of them have a positive relationship between growths. It implies that increase in labor force brings the positive change in the growth of the country. It is because now these countries have skilled labor which helps the country to accelerate their growth. This result is significant at 5 percent. From this it could be seen that in the period of 1962-2016 in Pakistan and India and from 1971-2016 in Bangladesh there were always a labor surplus. The result of prevailing situation on economic growth of Pakistan, India and Bangladesh shows that they are the labor surplus economies and it is definitely true. These south Asian countries have visibly shifted from primary commodity exporter to the labor intensive exporters. About more than 85% of total exports of these countries comes from manufactured. Within manufactured there is a clear direction towards value added exports. This shift helped these countries to increase its exports and as a result their exports expanded. It has automatically changed the whole economic structure of Pakistan, India and Bangladesh [Husain, (2003)]. Weighted export rate of Pakistan, India and Bangladesh shows the positive sign and is significant at the percentage of 5. The weighted export coefficient is 0.00099 for Pakistan, 0.62754 for India and 0.4305104 for Bangladesh. This shows that if export increases by 1 percent than the GDP increases around 0.00099 percent for Pakistan, 0.62754 for India and 0.4305104 for Bangladesh respectively. Model 1 fails to distinguish productivity differential effect (δ) from externality effect. In the model 2, I would be focus on the difference between productivity differential effects from externality effect. However to obtain the possible range of F_x values, calculation of corresponding values of factor productivities for the export sector along with it values of the whole economy will be done. Table 3 represents following results.

Table 3. Predicted marginal productivity of capital for possible values of the externality effect:

Pakistan:

Possible values for marginal externality effect(Fx)	Productivity gap between the export and non-export sector(δ)	Marginal Productivity in the non-export sector(F_K)	Marginal productivity in the export sector(H_K)	Marginal productivity in the whole economy(MP_K)
0.1	3.627029	0.85878	3.973601	2.478487
0.2	2.163342	0.85878	2.716616	1.824855
0.3	1.403145	0.85878	2.063773	1.485377
0.4	0.937529	0.85878	1.663911	1.277448
0.5	0.623057	0.85878	1.393849	1.137016
0.6	0.396411	0.85878	1.19921	1.035804
0.7	0.225308	0.85878	1.05227	0.959395
0.8	0.091558	0.85878	0.937409	0.899667
0.9	-0.01587	0.85878	0.845155	0.851695
1	-0.10404	0.85878	0.769433	0.81232

-See Prasad, B, C. and Narayan, P, K. (2006)

$-\varphi = \delta / (1 + \delta + Fx)$ where φ is the coefficient of weighted export growth.

- F_K is the coefficient of the investment- GDP ratio.

- $H_K = (1 + \delta)F_k$

- $MP_k = F_k (1 + \delta(Ix / I))$ where $(Ix / I) = 0.52$

INDIA:

Possible values for marginal externality effect(Fx)	Productivity gap between the export and non-export sector(δ)	Marginal Productivity in the non-export sector(F_K)	Marginal productivity in the export sector(H_K)	Marginal productivity in the whole economy(MP_K)
0.1	1.204575	0.622126	1.371522	0.906896
0.2	0.806351	0.622126	1.123777	0.812753
0.3	0.529983	0.622126	0.951841	0.747418
0.4	0.32696	0.622126	0.825536	0.699421
0.5	0.171506	0.622126	0.728824	0.662671
0.6	0.048655	0.622126	0.652395	0.633628
0.7	-0.05088	0.622126	0.590475	0.610098
0.8	-0.13315	0.622126	0.53929	0.590648
0.9	-0.2023	0.622126	0.49627	0.574301
1	-0.26123	0.622126	0.459607	0.560369

-See Prasad, B, C. and Narayan, P, K. (2006)

$-\varphi = \delta / (1 + \delta + Fx)$ where φ is the coefficient of weighted export growth.

- F_K is the coefficient of the investment- GDP ratio.

- $H_K = (1 + \delta)F_k$

- $MP_k = F_k (1 + \delta(Ix / I))$ where $(Ix / I) = 0.38$

Bangladesh:

Possible values for marginal externality effect(Fx)	Productivity gap between the export and non-export sector(δ)	Marginal Productivity in the non-export sector(F_K)	Marginal productivity in the export sector(H_K)	Marginal productivity in the whole economy(MP_K)
0.1	0.501825318	0.401288	0.602665	0.495935
0.2	0.30572781	0.401288	0.523973	0.45895
0.3	0.154925921	0.401288	0.463458	0.430508
0.4	0.035350597	0.401288	0.415474	0.407956
0.5	-0.06178731	0.401288	0.376494	0.389635
0.6	-0.142261431	0.401288	0.3442	0.374457
0.7	-0.210020979	0.401288	0.317009	0.361677
0.8	-0.267858612	0.401288	0.2938	0.350769
0.9	-0.317804936	0.401288	0.273757	0.341349
1	-0.361371835	0.401288	0.256274	0.333132

-See Prasad, B, C. and Narayan, P, K. (2006)

- $\phi = \delta / (1 + \delta + F_x)$ where ϕ is the coefficient of weighted export growth.

- F_K is the coefficient of the investment- GDP ratio.

- $H_K = (1 + \delta)F_k$

- $MP_k = F_k (1 + \delta (I_x / I))$ where $(I_x / I) = 0.47$

Now I estimate equation (17) model 2. Keeping the equation (17) in mind it consists of productivity differential γ into its components $(\phi_1 + \theta_1)$. The parameter on \dot{X}/X is interpreted as the externality effect of export sector on the non-export sector. The results show that the externality parameter θ is statistically positive and significant at 5 percent in the model 2 for all the three countries. The interpretation is that if export increases by 1 percent it leads an increase in growth by 0.0281 percent for Pakistan, 0.0287 percent for India and 0.0042 percent for Bangladesh respectively. The other component of productivity differential associated with \dot{X}/Y . Using the point estimates on both export variables and referring to equation, $\delta = (\phi_1 + \theta_1) / [1 - (\phi_1 + \theta_1)]$ have identified the difference δ . δ is the marginal factor productivities in the export and non-export and it measure the *factor-productivity effect*. The productivity differential parameter δ is obtained as **0.03** for Pakistan, as **2.07** for India and as **0.78** for Bangladesh (calculated from the estimate of θ and the ϕ). This shows that there is a sustainable productivity differential between export and non export sectors. As $\delta > 0$ form this it becomes clear that export sectors are more productive than non-export sectors in all three countries. Hence it is proved from observing all three countries that if the economy is shifting its resources from non-export sectors to exports sectors then it is beneficial and significant [Gupta, (2011)]. Relation with international markets and openness to the world also expands the domestic activities. Domestic economic activities increase because as the size of exported good expands relative to the rest of the economy. According to comparative advantage yield such types of changes brings efficiency gain and increase the welfare of the economy. In short if the economy is open to the rest of the

world then it gets exposure and understanding of new technologies and changes taking in rest of the world [Husain, (2003)].

7. Conclusion:

In this session I am taking assistance from Feder (1982) two sector models to analysis the productivity between exports and non–exports sectors in south Asian countries (Pakistan, India and Bangladesh). I estimate two sets of models. The first model is that which did not distinguish the productivity in a theoretical manner and the second is which followed the theoretical norms and derivations. From both cases I got the same statistically significant evidence and conclusion that weighted exports are positively related to economic growth in all these three countries. The next thing which I found that in model 2 labor force growth rate is positive and statistically significant. This situation proved that Pakistan, India and Bangladesh are the labor surplus economy and their labor forces are positively contributing in economy's growth.

After theoretical derivation, finally I am able to find that the productivity differential between export and non-export sectors is small. I also found that the magnitude of inter-sector externality parameter is small and statistically significant. From entire situation I could point out the fact that all mention economies are in the initial stage of export-led industrialization. Keeping as assumption that Pakistan, India and Bangladesh's exports diversification has not been achieved. On the other hand industrial activities are also only focusing on few sectors. As a result these countries have economies of scale and positive externalities on the non-export sector and in this situation these countries pursue for export-led growth. These south Asian countries have adopted export- led strategy for growth very late and this delay in adopting this strategy has affected their future. In my point of view for these countries internal constraint is more serious issue as compare to external constraint for having successful export led strategy for growth. To solve this issue these countries should consider important policy and implement to resolve this matter. The internal constraints for successful export-led growth for these countries depends on macroeconomics stability, lack of appropriate public infrastructure, underdevelopment of appropriate institutions for investment and export and distorted factor markets. There are many problems which are rooted from high corruption, budget deficit etc. The newly industrialized Asian countries are continuously investing in infrastructures like roads, airports and public utilities like water, gas telecommunication. In order to fulfill export led strategy Pakistan, India and Bangladesh still have to invest good amount in infrastructure [Zafar Mehmood, (1998)].

With export led strategy Pakistan, India and Bangladesh are able to have products which are low technology but need more labor. Among twenty top productions market dynamics consideration Pakistan, India and Bangladesh have command on textile and clothing, leather and primary commodities. The textile industry of these countries have achieved revealed comparative advantage (RCA) greater than one and domestic resource coefficient (DRC) of less than one. This was possible by having adequate domestic production of raw material at low cost and abundant supply of labor at competitive cost. From these indicators it became clear that now these countries are in a position to face the competition of the world. The other policy indicator that is Real effective exchange rate, it also present the strength of these countries exports with having competition in the third world country markets [Husain, (2003)].

In South Asian countries like Pakistan, India and Bangladesh, there is flexibility in labor market as compare to land market. Due to property rights and political instability, these countries have to face problems and finds difficulty in investment and growth. This constraint is creating problem in agriculture and industrial sector. Constraint is also giving harmful effect on export and tourism. These countries are facing instability in politics in the form of military coups, lacks of constitutional government. In short political instability brings uncertainty in economic policies and due to this investor do not feel to invest in the market.

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Appendix : Tables

Table 4. Descriptive Statistics (Pakistan)

	GDP	INVGDP	LF	AGRE	AGREUW
Mean	1.576635	16.62587	0.002156	14.12603	1.363975
Std. Dev	0.494802	8.408121	0.0535025	3.403325	1.33404
Minimum	0.142934	9.318356	-0.1455382	8.977542	-0.5879251
Maximum	2.429523	50.73384	0.1166474	24.64303	3.662703
Observation	55	55	55	55	55

Table 4.1 Correlation Matrix (Pakistan)

	GDP	INVGDP	LF	AGRE	AGREUW
GDP	1.0000				
INVGDP	0.8012	1.0000			
LF	0.0560	0.0468	1.0000		
AGRE	0.6993	0.4437	0.0640	1.0000	
AGREUW	0.2194	0.1061	0.0075	0.2578	1.0000

Table 5. Descriptive Statistics (INDIA)

	GDP	INVGDP	LF	AGRE	AGREUW
Mean	1.558472	14.93752	0.0021425	13.17735	1.811035
Std. Dev	0.6652384	8.130874	0.0595537	4.525689	1.126135
Minimum	0	0	-0.1195479	0	0
Maximum	2.328249	49.1660	0.1718052	20.91644	3.451821
Observation	55	55	55	55	55

Table 5.1 Correlation Matrix (INDIA)

	GDP	INVGDP	LF	AGRE	AGREUW
GDP	1.0000				
INVGDP	0.0745	1.0000			
LF	0.0341	0.3460	1.0000		
AGRE	0.2951	0.6290	0.1800	1.0000	
AGREUW	0.0038	0.0729	0.1844	0.0378	1.0000

Table 6. Descriptive Statistics (BANGLADESH)

	GDP	INVGDP	LF	AGRE	AGREUW
Mean	1.442375	13.61557	0.0054313	12.98135	1.601547
Std. Dev	0.5573901	6.369327	0.0832735	5.984375	1.610081
Minimum	-0.199498	-10.93298	-0.3465228	-10.48905	-3.557694
Maximum	2.260925	29.14895	0.1733861	27.03629	4.451381
Observation	46	46	46	46	46

Table 6.1 Correlation Matrix (BANGLADESH)

	GDP	INVGDP	LF	AGRE	AGREUW
GDP	1.0000				
INVGDP	0.3926	1.0000			
LF	0.0829	0.2187	1.0000		
AGRE	0.4167	0.9980	0.2241	1.0000	
AGREUW	0.1425	0.1507	0.1327	0.1662	1.0000

GDP = Gross domestic product. (\dot{Y}/Y)

INVGDP = Investment-GDP ratio. (I/Y)

LF = Labor force (\dot{L}/L)

AGRE = Annualized growth rate of export. (\dot{X}/Y)

AGREUW = Annualized growth rate of export unweighted. (\dot{X}/X)