CHAPTER FIVE

OUTPUT AND TRADE RELATION

5.1 INTRODUCTION

5.1.1 The process of growth was uneven across space and time. Maddison (2006) has further discussed about three interactive processes which could have possibly sustained economic performance. These processes encompasses: conquest of relatively empty regions which had productive land, new resources and also possess capability to support transfer of population, crops etc; international trade and capital flows; technological and institutional innovation. It has also been widely accepted that economic growth is an extremely complex process, which depends on a number of factors like trade, fluctuations in price, capital accumulation including both physical and human, distribution of income, political situations and even more on geographical characteristics (Medina-Smith, 2001). Of all factors, export has emerged as one of the key means to an end called economic growth and development.

5.1.2 The mercantilists are known to be the first to consider export promotion as a key part of their economic policy, and were also criticized for their erroneous reasoning by Adam Smith (Afxentiou and Serletis, 1991). However, in modern times, exports are examined in the light of general equilibrium analysis, and further to this approach empirical international relationships between exports and other variables, particularly GNP, have also seen. Several scholars, like, Keesing (1967), Bhagwati(1978), Krueger (1978), Chenery and Strout (1966), Voivodas(1973) and Scitovsky (1954) have discussed various gains of export growth, such as, opening of economies to global communication regarding new ideas and methods of production which strengthen competitive behaviour and boost efficiency;
also the ability of small countries to overcome market constraints and benefit from cost advantages of increasing returns to scale; relaxing foreign exchange limitations that normally interrupt development initiatives; and also positive externalities which affect the entire economic structure of an economy.

5.1.3 The gains from export expansion, as stated in the preceding paragraph, according to Afxentiou and Serletis (1991) lose some of their significance in industrialized economies. In line with this, Afxentiou and Serletis (1991) puts to the fore, ‘Generally any increase in exports led to growth of income in either developed and developing economies, this is mainly due to the fact that exports are one of the components of national income. However, positive externalities from exports which are generally expected in developing economies, are significantly reduced by the advance infrastructure of developed economies. Further, industrialized countries which are already competitive, and due to their industrialized nature they have continuously adopted advanced production techniques, therefore, neither the enhanced competitive behaviour nor diffusion of advanced production techniques due to export, reap much of the expected benefits’.

5.1.4 In the light of the arguments, the present chapter would deal with one of the key process, that is, international trade, in relation to economic growth, a relationship subject to considerable controversy. There are several attempts undertaken over the years to work out the relationship between the two, but yet there is no common consensus.

5.2 RELATION BETWEEN ECONOMIC GROWTH AND EXPORT: THE BACKGROUND

5.2.1 Of all factors, export has emerged as one of the key economic growth and development as a factor. Export led growth (ELG) is an economic development strategy in which international trade and more specifically
export is considered to be an engine of a country’s growth and development. There has been a general global shift towards the ELG strategy in recent years. This change has been found to be, because of the actual and potential economic benefits this strategy accorded to both developing and developed countries alike (Sentsho, 2000). Rapid growth of export is often linked with economic growth in several ways (UNCTAD, 1992).

5.2.2 Export expansion positively influences growth because it will increase the efficiency of resource allocation, increase capacity utilization allow taking advantage of scale economies and promote technical change (Balassa, 1978, 1985). According to Jung and Marshall (1985) export growth has led to multiplying output, employment generation and consumption which resulted in an increase in the demand for a country’s output. Bhat (2011) also sheds some light on the issue. According to him, export leads to growth via export encouraging policies, for example, export subsidies or exchange rate depreciation which will in turn boost growth. The positive externalities encourage economic growth. The reverse side of this argument puts forth that the economic growth promotes exports which depends on the gains in productivity which will lead to comparative advantages in certain sectors that in turn result in the growth of export.

5.2.3 Several studies were undertaken to explore the relationship between export and economic growth (Annexure 5.1). In line with this approach, extensive studies were done by Greenaway and Sapsford, 1994, Shan and Sun, 1998; Marin, 1992; Sereletis, 1992; Hodne, 1994; Henriques and Sadorsky, 1996; Islam, 1998; Ghatak, ner and Utkulu, 1997; Al-Yousif, 1997; Ghatak and Price 1997; Sharma and Dhakal, 1994; and Ukpolo, 1994, Balassa (1978), Feder (1982), Kavoussi (1984), Ram (1985), Tyler (1981), Fosu (1990), and Kugler and Dridi (1993) etc. However, whether the export led growth strategy will also be beneficial to the small resource-based economies across the globe, for instance like that of Sub-Saharan Africa, is still a debatable issue (Olorunfemi & Olowofeso, 2006).
5.2.4 Though, the cause and effect link between export and growth of an economy, both from the theoretical and the empirical angles lack universal consensus and turns out to be one of the much debated issue. Some authors, as already mentioned earlier, find causation from exports to GNP, while others have concluded that exports retard GNP growth (Holman, *et al.*, 1995). In contrast, some believe that it is economic growth which multiplies export potential. Among others, Ocampo & Vos (2008) argue that despite sound theoretical arguments, the statistical substantiation of the causal relationship between export growth and growth is somewhat mixed, and it seems to vary both over time and across country. They further state that the growth performance is expected to be correlated with the particular composition of the exports that a country chooses over a period of time. On similar lines of argument, Dimkpah (2002) has pointed out that export growth and economic development are positively correlated; however, the impact is stronger in middle-income countries than in low-income countries. According to him this reflects on the fact that in less developed economies policies favouring exports would ‘facilitate economic growth’. Colombatto (1990) has pointed out that higher growth rates in export do not necessarily benefit economic growth.

5.2.5 In analyzing the link between trade liberalization and growth, both theoretical and empirical, has been prolific. Models of ‘endogenous growth’ have been constructed, under the theoretical approach that suggests openness should be positively associated with growth (Grossman and Helpman, 1991; Barro and Sala-i-Marti, 1995; and Obstfeld and Rogoff, 1996). Such models support the view that openness stimulates growth through numerous channels such as access to technology, access to intermediate and capital goods or increased competition (Grossman and Helpman, 1991; Lucas, 1988). However, other models showed the not so optimistic picture, like how openness can also push countries into less dynamic sectors and harm growth (Rodriguez and Rodrick, 2001). As dealt by Winters *et al.* (2004), an alternative approach to linking trade liberalization and growth is through
productivity. Coe et. al. (1997) show a positive effect of a country’s openness on total factor productivity. However, in the short run some factor owners could suffer if productivity increases faster than output (Parker, Riopelle and Steel, 1995). Openness could also harm growth through increased macroeconomic volatility (Easterly and Kraay, 2000).

5.2.6 Numerous other studies have also appeared on the issue. Some of these concentrate on single country and some concentrated on multi country analysis. Hence, it could be seen that it is very difficult to bring out a distinct relationship between export expansion and the process of economic growth. In this regard, Goncalves and Richtering (1987) said the reasons behind this relationship that varies across economies, might depend on their respective historical experiences of development, and domestic as well as international environment. They further say, “These differences are often not taken into account the indiscriminate use of bivariate tests on the statistical relationship between export performance and output growth. Making broad generalizations and drawing strong generalizations and drawing strong conclusions on the basis of such tests, leaving out other important explanatory variables, should be discouraged.”

5.2.7 In line with this, Nurkse (1959) argued that, unlike the nineteenth century, in the twentieth century trade was not an engine of growth. Kravis (1970) pointed out that trade and capital flows were ‘handmaidens’ but not engines of growth. He further noted that key factors affecting growth were ‘internal’ like land, human resource, economic and social institutions. Reynolds (1983), for the post Second World War era has put forth the existence of examples of non-export induced growth, though he has also pointed out on the basis of few newly industrializing economies “a tendency for a high growth rate to be associated with export success”. Goncalves and Richtering (1987) pointed out that a notable feature of inter-country comparisons of the relation between export increase and economic growth is their restrictive nature.
5.2.8 In addition to views stated at the outset, there are efforts undertaken to work out the reverse causality from GNP (Gross National Product) to export on the basis of theoretical grounds supporting plausibility of such causality. In the light of this, Afxentiou and Serlettis (1991) stated that such causality is plausible. They further added that such causality could be envisaged in cases where the long run accumulation of physical and human capital, in combination with new technology, augments overall productivity of an economy and in this very process the country get benefited with favouring comparative advantage in international trade. In this context Kindleberger (1973) further stated, in other cases, like high growth economies having relatively high propensities to save, because of their low absorption, to look for foreign markets, in order to utilise sizeable parts of their incremental output.

5.2.9 In line with this viewpoint, Kaldor’s (1964, 1967, 1968) contribution is worth citing, which was aptly dealt by Stavrinos (1987). According to Kaldor (1967), “the very fact of a faster growth of output could be expected to act as a stimulus to exports when output and capacity are both enlarged, productivity is increased and unit costs are reduced. It is then easier to sell abroad”. However, a major weakness such reasoning faces is that it is based on the implicit assumption that while progress is made in one industrial country facilitating growth of export, there is total passivity in other industrial countries. This assumption is a misfit in the dynamic industrial world (Afxentiou and Serlettis, 1991).

5.2.10 In this backdrop, an exploratory attempt was made to work out such causality from GDP to merchandise export. As compared with previous studies, the present analysis is not confined to country specific or region specific, rather it is attempted at a broader scale and covers 87 countries with varying levels of development and openness.
5.3 SOURCES OF DATA AND DATA BASE

5.3.1 There are differences in definitions and other kinds of discrepancies between different sources of data, each with their own advantages and limitations (Refer to section 1.6.12). The data set for merchandise export and import are taken from UNCTAD Handbook of Statistics, 2006-07. Data are reported in current United States dollars. As for Gross domestic product data is concerned, it is extracted from World Development Indicators, 2007, a World Bank annual publication.

5.4 METHODOLOGY

5.4.1 The major objective of the present chapter is to bring out the relationship between international trade (measured here in terms of merchandise export) and size of the economy (Gross Domestic Product). According to Mahmood (1977) in case of social sciences it is difficult to find out exact relationships and he further adds ‘we have to tolerate a certain amount of error while approximating them into any exact form of relationships’. Hence, knowing the limitation of the statistical tools and analysis, an effort is being made to explore the relationship between the two variables. Most of the previous studies relate economic growth to export or openness. In this chapter, an attempt is made to explore economic growth and trade nexus from another perspective as mentioned in the beginning. The relationship being worked out is between proportion of merchandise export to world merchandise export as a dependent variable and gross domestic product as an independent variable.

5.4.2 For the analysis, we have made use of statistical, graphical and cartographic techniques like regression\textsuperscript{10}, scatter plots\textsuperscript{11}, maps of residual from regression\textsuperscript{10}, regression analysis helps in analyzing the statistical association between two (or more) variables. Mukherjee, \textit{et.al.} (1998) also pointed out that a regression model only depicts statistical association between two variables, but in itself it cannot establish the direction of causality between them. Whether a causal link exists between two variables and which way the causality runs is a matter which can only be settled by sound theoretical reflection.
etc. The simplest method for examining the relationship between two different characteristics is a Scatter diagram. Most often a scatter diagram is used to provide basic evidence of cause-and-effect relationships. As mentioned diagram shows relationships between two variables, however, correlation does not necessarily mean a direct cause and effect relationship. Further, a single analysis using a bivariate model should not be expected to be sufficiently accurate because it is difficult to scale down the dynamic world process to a few or couple of indicators, Pal (1982) further argued that in the real world any dependent phenomenon is a function of several independent variables. For the present chapter scatter plots have been attempted on different scales - arithmetic, logarithmic and semi-logarithm. Though for the final analysis we have considered results pertaining to arithmetic and logarithmic scales. In line with this Mukherjee, et.al. (1998) have pointed out that in econometric practice logarithmic transformation is very popular. One of the reasons is that functions which can be linearised with the help of logarithms have coefficients ‘which lend themselves to meaningful economic interpretations, like growth rate or elasticity; second is that the logarithmic transformation frequently (but not always) does the ‘trick’ with socioeconomic data which are most often skewed to the right. It has been noted that logarithms have the property of shrinking the distance between two or more values which are greater than 1.

5.4.3 Data used for scatter plots are used in the regression analysis with GDP as independent variable and proportion of merchandise export to world merchandise export as a dependent variable. Further, standardized residual\textsuperscript{12} values for each country are plotted on the map. Residuals as discussed by Pal (1982) provide an insight into how well the regression equation predicts the dependent variable for a particular observation.

\textsuperscript{11} In bivariate analysis (as to graphics), a simple but powerful tool is the scatter plot (Mukherjee, et.al., 1998). It is the simplest method of seeing the relationship between two variables by plotting the two variables against each other on a graph.

\textsuperscript{12} Pal (1982) has pointed out that for mapping residuals should be standardized, this is done by dividing the absolute residuals by their standard deviation, which in this case is the standard error of the estimate. By this the magnitude of the residuals is affected but the relative pattern remains the same.
5.5 AN ANALYSIS OF THE RELATION BETWEEN GROWTH AND EXPORT

5.5.1 As stated earlier in the chapter an initial step was undertaken in this present chapter to explore relationship existing between economic growth or gross domestic product and share of merchandise export, for the entire spectrum of countries with varying level of development and openness.

5.5.2 It is quite explicit from the scatter plots that the two variables are not linearly related (Figure 5.1). Further, it can be broadly inferred that there exist a positive correlation between gross domestic product (GDP) and merchandise export (share of merchandise export to world merchandise export). Figures 5.3 and 5.4 shows scatter diagram plotted on double log scale, clearly reflecting a log linear relationship pattern in 1990 and 2005. It can be said that with the change of scale, the nature of correlation varied. It can also be seen from scatter plots that relatively low exporting countries or small players in international merchandise export are relatively less affected by their gross domestic product/economic size. In case of higher income economies like for example United States, United Kingdom, Germany, France, Japan, and China recently added to this group, share of merchandise export is also high, reflecting that gross domestic product does influence the same.

FIGURE 5.1 Association between Merchandise Export and GDP (1990) (Arithmetic Scale)

Source: Based on Annexure 5.2
FIGURE 5.2 Association between Merchandise Export and GDP (2005) (Arithmetic Scale)

Source: Based on Annexure 5.3

FIGURE 5.3 Association between Merchandise Export and GDP (1990), (Double Logarithmic Scale)

Source: Based on Annexure 5.2
5.5.3 Regression analysis\(^{13}\) is also attempted for the same data set in this chapter. Most importantly, the regression confirms that GDP is a major determinant of international trade. The R\(^2\) of the Regression is 0.73 and 0.58 for 1990 and 2005 respectively. The positive relationship may not reflect an effect of GDP on export. To explore this relation further, later in the chapter an attempt is made to aggregate across countries and to see whether GDP is a key determinant of their merchandise export. The resultant standard residuals\(^{14}\) are mapped and analysed. It will show the spatial variation in the degree of fit of the regression equation (Pal, 1982). Geographers often plot

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\(^{13}\) Regression analysis provides a functional relationship by which the value of one variable can be estimated from the value of another variable, and one variable is thus considered as dependent upon the other (Pal 1982).

\(^{14}\) The absolute residual of a particular observation of X or Y does not have much use in research because of the problem of units of measurement when comparing two or more sets of values. In this context, the standardized residual is preferred which expresses the value of the absolute residual in terms of a normal distribution of residuals. Standardized residual bands, like standard error bands, run parallel to the regression lines. Therefore, they do not give undue emphasis to the residuals in Y related to either the large or small values of X (as do absolute residuals) (Pal 1982).
these residuals, as it plays a scientific role in geographical research. Regions where residuals show that regression is a poor indicator, then there are other factors other than the independent variable which affect the dependent variable (Mahmood, 1977; Pal 1982). Through residual mapping it is convenient to identify and regionalise the countries having high negative (here below minus 0.29) and high positive (above 0.75). To maintain comparability the values of class divide are kept constant for 1990 and 2005.

5.5.4 The relationship between trade and gross domestic product may differ significantly according to circumstances and nature of economic structure of countries. The residual values reflect how individual values differ from their predicted values, i.e., it captures variations in the levels of merchandise export not explained by variations in gross domestic product. In 1990, group of countries exporting more than expected from their size of the economy includes large industrialized countries like Germany, France, Netherlands, Belgium-Luxembourg, UK, Canada and Italy, as well as smaller ones like Singapore. Singapore has been one of the most dynamic element in the world as well as one of the resurgent Asian economy. It is a strategically placed city state ‘with a vocation for entrepot trade’ but growth got impetus from the government via promotion of high savings, development in education, boosting export and acquiring foreign technology. Its own manufacturing production grew more sophisticated, labour costs shot up and it became a major capital exporter (Maddison, 2006). The rest of the Western European countries and Canada (Western offshoots) falling in this group have quantitative historical evidence better than most other parts of the world (Maddison, 2006). In line with this, all these countries are industrially advanced rich nations with preponderance of manufacturing goods in export basket.

5.5.5 It can be broadly said that in case of larger exporting countries GDP does makes a difference and there seem to exist a relation between economic size and the export in the group of economies stated in the previous section.
Germany accounts for 10.7 per cent of world trade, France around 7 percent, UK about 5 percent, Netherlands, Belgium-Luxembourg and Canada accounts for approximately 4 percent, whereas Singapore registers 2 percent of the world trade. The compound growth rate of the value of merchandise export during 1990-95 for Singapore was highest with more than 16.18 per cent. Germany, France, UK, Canada and Italy registered low growth rate (CAGR 8.09-4.05), and economies like Netherlands and Belgium-Luxembourg registered a moderate growth rate of 8.09 per cent to 12.14 per cent during that period.

5.5.6 Countries constituting high negative residual group depict that these economies export less than expected from their GDP. This group consists of 47 countries spread across Africa, Asia, Oceania, North and Latin America (Figure 5.5). It can be said that in these countries, other than GDP, there are other factors which influence level of merchandise export. This group comprises of the largest, viz., United States and smallest country, viz., Fiji (a small island developing economy), in terms of gross domestic product, among the 87 countries across the globe. It is worth noting here that in this group only United States account for around 11 per cent of the world merchandise export, while rest of the countries have less than 1 per cent of share in world merchandise export. Nature of the export basket vary across the group, measured broadly in terms of largest export share of individual commodity (SITC Rev 3 classification, 1 digit tier) group in total product export. It ranges from major petroleum exporters (e.g. Bahrain, Syrian Arab Republic, Brunei Darussalam, Gabon), to major exporters of manufactured goods (e.g. United States, Dominican Republic, Malta), to major exporters of food items (Panama, Iceland, Honduras) etc. This diverse set of economies have registered varying rates of compound annual growth rates over 1990-95 ranging from negative to very high growth rate.
FIGURE 5.5

Source: Based on Annexure 5.4

FIGURE 5.6

Source: Based on Annexure 5.5
5.5.7 In 2005, country composition of high positive, medium and high negative residual group remains the same with a minor variation (Figure 5.6). For instance in high positive residual group China and USSR (former) are new entrants in 2005, relative to 1990. On the other hand, New Zealand, Portugal and Yugoslavia SFR (former) have joined high negative residual group in 2005.

5.5.8 As stated earlier that in 2005 same countries constitutes the high positive residual group, with China and USSR (former) as new members, reflects that these nations consistently export above the predicted levels, and did so virtually the entire time period. The most striking result is the remarkable expansion of Chinese economy (by GDP) and export. China’s GDP has increased significantly over the years from being eleventh largest to the fourth largest in the world. Its merchandise export share to world export has also mounted up from 1.78 per cent in 1990 to 7.30 per cent in 2005. China is predominantly an exporter of manufactured goods with a share of 92 per cent in its export basket. On the other hand, USSR (former) has not shown remarkable growth in terms of its GDP size, it has slipped from seventh largest to tenth largest among 87 countries under analysis from 1990 to 2005 respectively. Similarly its merchandise export share to world export has also not shown any remarkable change, for example, it accounts for 2.99 per cent in 1990 and 3.43 per cent in 2005. There have also been some signs of increasing relative concentration in its export basket in favour of fuels over manufactured goods from 1990 to 2005. The share of fuels in USSR (former) has inched up from 33.81 percent in 1990 to 53.28 per cent in 2005, whereas proportion of manufactured goods has declined from 34.45 per cent to 26.53 per cent over the same period.
5.6 MAJOR FINDINGS

5.6.1 This chapter attempted to explore the much debated question of relation between economic growth and export.

- Correlation between the two variables is positive. There is a log linear relationship between GDP and merchandise export.

- Low exporting countries are relatively less affected by their gross domestic product/economic size.

- In case of higher income economies like for example United States, United Kingdom, Germany, France, Japan, and China recently added to this group, share of merchandise export is also high, reflecting that gross domestic product does influence the same.

- Deviations in the relationship between GDP and merchandise export varied across economies and hence it could be said that it is more country-specific, and needs to explain through other variables.