Contribution of Net Exports to Economic Growth of India- An Empirical Study

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ABSTRACT

India was a straggler to the economic reforms, embarking on the process in earnest only in 1991, in the wake of an exceptionally severe balance of payment crisis. But with the advent of Liberalization, India entered into the era of trade reforms in 1991 and is moving gradually towards an open economy. Consequently, a change took place in regard to trade liberalization with distinct emphasis on Export-Led Growth policy. The study is based upon quarterly time series data covering the period from 1990 to 2013. It is generally believed that export and import growth is crucial in providing the stimulus for economic growth in developing countries and exports provide the important ‘virtuous’ link between trade and output growth. Consequently, our aim here is to address the Export-Led Growth and Growth driven exports hypothesis for India. The objective of the paper is to investigate co-integration between Exports and economic growth under the VAR framework using Co integration, VECM, Variance Decomposition Analysis, and Granger causality. The results reveal a positive relationship between exports and GDP which can have severe implications for economic growth. The results of co integration confirm this fact that they share long term relationships, with more adjustments done in exports to move towards equilibrium. Granger Causality shows unilateral granger relationships from Exports to GDP, i.e. exports are causing rise in GDP. The policy implication of such empirical evidence may be that the Government of India and other policy-planning bodies should devise prudential norms and policies to make the macro-economic fundamentals of the country strong enough to absorb the external shudders thereby attaining a fast growth of real economic variables to ensure a clear surge in the country’s exports.

Keywords: Export-led Growth Hypothesis, Growth-led Export Hypothesis, Gross Domestic Product, Co-integration, VECM, Error Correction Term, Granger Causality, Variance Decomposition Analysis.

SECTION I: INTRODUCTION

Economies in the era of Globalization are concerned with increasing the quality of life of their citizens which is mainly ensured by the macro-economic prosperity in any economy. And, macro-economic prosperity further is safeguarded by an escalation in the Gross Domestic product, which makes it the most important objective of any economy. There are various approaches to achieve this target of which
one possibility is to promote exports. At this juncture, an important issue immediately cracks the
minds of researchers and economists, that is, whether export promotion leads to higher economic
growth or economic growth promotes exports growth? Thus, different economists came up with
contradictory views at different times and the literature puts forward a debate for researchers and
policy makers since the last few decades. One school of thought argues in favor of Export-Led Growth
(ELG) hypothesis while the other school advocates for growth-driven export hypothesis. In addition,
the existing literature also provides the evidence that export promotion leads to economic growth and
economic growth leads to export promotion, i.e., the bi-directional causation between exports and
GDP, a proxy of economic growth.

The Export-led growth hypothesis generally reflects the rapport between exports and economic
growth. The protagonists of such hypothesis argue that export promotion as an ‘engine of growth’
through policies such as export subsidies or exchange rate depreciation will increase economic growth.
The substance of the neo-classical arguments underlying the export-led growth hypothesis is that
competition in international markets promotes economies of scale and increases efficiency by
concentrating resources in sectors in which the country has a comparative advantage. These positive
externalities promote economic growth (Balassa, 1978; Bhagwati, 1978; Krueger, 1978; Vohra, 2001
Feder, 1982; Krueger, 1990; Ullah et al. 2009, Kavoussi, 1984). On the other hand, the argument that
economic growth promotes export growth stands on the idea that gains in productivity give rise to
comparative advantages in certain sectors that lead naturally to export growth. Also, countries with
high growth rates and relatively low absorption rates must necessarily export the excess output
(Sharma and Panagiotidis, 2005; Fosu, 1996; Thornton, 1996; Henriques and Sadorsky, 1996). In
addition, some studies validate that there exists a bi-directional association between these variables
such that export causes economic growth and economic growth causes export (Husein (2009),
Bhattacharya et al. (2009), Dutt and Ghosh, 1994; 1998b; Khalafalla and Webb, 2001; Thornton,
1997). It is due to such contradicting evidences about the dynamic relation between exports and
economic growth that many developing countries are still in dilemma whether to open up their
economies to promote international trade or whether they should concentrate on economic activities
that will promote international trade. The reason for this ambiguity is partly attributable to the changes
of trade policy in developing nations in the wake of globalization. India, a developing country and
previously a fairly regulated or inward-oriented economy, has welcomed globalization in an exemplary
way by opening the economy to a great extent. By registering spectacular growth in both exports and
output in topical decades, India has drawn consideration on export-led growth hypothesis. The country
initiated economic reforms and trade liberalization in the early 1990s. Several studies are not able to
capture this reform while examining export-led growth for this country. This study fills that gap by
revisiting ELG for India over the 1990–2013 period, and assesses the role of liberalization in ELG.
Although the number of studies on the export–output relationship for India but the results are still
inconclusive. This is the main rationale why large number of researchers and research organizations
are focusing on this area as no comprehensive study is available explaining this relationship. In this
backdrop present study is a modest attempt to investigate the co-integration between the two variables,
namely, Economic Growth (GDP) and Exports of India during the Post-Liberalization period, to
understand whether they share long term relationship or not; i.e. short term dynamics, followed by
vector error correction model to understand short term dynamics i.e. what is the movement of both the
variables to achieve equilibrium. After confirming the short and long term dynamics between the
sample series, it is important to know the direction of causality between them. For understanding
causal relationship Granger Causality is applied.

To achieve the objectives of the study it is divided in the following sections. Section I i.e. the
present section gives the insights of the linkages of economic growth and Exports. Section II gives
review of literature, Section III highlights data and methodological issues. Section IV entails analysis
and interpretations of results. Section V gives summary, policy implications and suggestions.
References forms the part of last section.
SECTION II: REVIEW OF LITERATURE

The following section gives a synoptic view of the existing studies done in India and abroad. The extensive literature concerning the relationship between export and growth is also the results of the fast changes that have taken place in the field of development economics and international trade in the last two decades (Dash, 2009). The International Trade and Development theory argued that exports growth (due to export oriented policies) contributes positively to economic growth and vice versa. Various economists and scholars have attempted in their respective studies to establish causal relationship between export and output growth. Rodrick (1996) described India as an ‘import substituting country par excellence’, which remained protected for a quite long period of time. Prior to 1990s, India’s import regime was dominated by quantitative restrictions on imports and a highly protectionist import tariff structure. The World Bank included India in the list of ‘strongly inward oriented’ countries, which means that the overall incentive structure strongly favored the production for the domestic market (Dutta and Ahmed, 2004). Nevertheless, the Indian Economy has been undergoing substantial changes since 1991(Dean et al, 1994). Almost all areas of the economy have been opened to both domestic and foreign private investment, import licensing restrictions on intermediaries and capital goods have been mostly eliminated, tariffs have been significantly reduced, full convertibility of foreign exchange earnings for current account transactions has been established (Dutta 1998). A one way causality from economic growth to exports growth is justified by, for instance, Shah and Tian (1998) and Henriques and Sadorsky (1999). They observed that economic growth has upgraded the level of productivity growth and improved productivity is expected to facilitate exports.

Biru Paksha Paul and Anupam Das (2012) while re-examining the export–output relationship over the 1960–2009 period finds a strong evidence of export-led growth for India. They concluded that while there is no long-run co-integration relationship between India’s exports and output, tests of causality and impulse responses show a significant positive impact of export growth on output growth in the short run. Autoregressive models of India’s output growth also reveal the significant role of export growth over the same period. A study on the quarterly time series data by Rajwant Kaur and Amarjit Singh Sidhu (2012) for the period from 1996–97 to 2008-09 analyzed the relationship between three variables i.e. trade openness, export growth and its impact on economic growth within the framework of Vector Error Correction Model (VECM) using the Johansen Technique of Co-integration and the Block Exogeneity Wald Test. The study found that there is bi-directional causality running from GDP to export growth and vice versa for India. The ELG and GLE hypothesis is valid for India and empirical evidence supports the existence of long-run equilibrium relationship between export growth and economic growth. On the contrary, in spite of some ambiguity, Exports- Granger cause GDP, lending support to ELG hypothesis, but the growth driven export hypothesis seem implausible (Laszlo Konya and Jai Pal Singh, 2006). OLS and 2SLS estimations are used in Rashid (1995), which covers a short sample from 1977 to 1989 in yearly data. Exports are found to have insignificant effect on output. Hence, Rashid argues that exports cannot be relied upon to act as the ‘engine of growth’ for the Indian economy. Using co-integration and error-correction methods over the 1992–2007 period, Dash (2009) finds a long-run unidirectional relationship, running from exports to output growth, in India. Dash uses quarterly frequency, which is different from others, and selects only the post-1991 liberalized regime to examine the relationship. He claims that mixed or ambiguous results on this export–output relationship are due to, among others, combining both the import substitution and export promotion periods of India. Dash claims that export-led growth for India is a liberalization phenomenon. In the short run, exports affect positively to change in GDP. Singh and Konya (2006) run Granger causality tests on Indian data for the 1950–2004 period and finds evidence for export-led growth. Their work also shows that GDP and imports can jointly Granger-cause exports, but GDP alone does not Granger-cause exports, suggesting the growth driven export hypothesis implausible. Ullah et al (2009) re-investigated the export-led growth hypothesis using time series econometric techniques over the period of 1970 to 2008 for Pakistan.

Jordaan (2007) analyzed the causality between exports and GDP of Namibia for the period 1970 to 2005. The export-led growth hypothesis is tested through Granger causality and co-integration.
models. It tests whether there is unidirectional or bi-directional causality between exports and GDP. The results revealed that exports Granger-cause GDP and GDP per capita, and suggested that the export-led growth strategy through various incentives has a positive influence on growth.

The results revealed that export expansion leads to economic growth. Hence, the literature available on ELG in India and abroad is voluminous but inconclusive.

SECTION III: DATA AND METHODOLOGY

This section describes the data and methodological issues. The data regarding GDP and exports has been downloaded from RBI’s official Statistical database portal. The time period considered for the same is 1990-2013 on a quarterly basis. Number of observations i.e. ‘n’ for the present study is 92. As mentioned in the introduction, this paper attempts to test the ELG hypothesis for India using natural logarithms of exports and GDP measured at constant prices (2004-2005 prices).

Firstly an attempt is made to understand the properties of the data from an econometric perspective with the help of various co-integration and error correction models to establish the equilibrium relationship between GDP and exports. Granger Causality Test is performed to test the causality and the findings are provided in detail in results section. The regression analysis would yield efficient and time invariant estimates provided the variables are stationary over time. Nonetheless, many financial and macroeconomic time series behave like a random walk. We first test whether or not the sample series are co-integrated. The concept of co-integration becomes relevant when the time series being analyzed are non-stationary. The time series stationarity of sample series has been tested using Augmented Dickey Fuller (ADF) 1981. The ADF test uses the existence of a unit root as the null hypothesis. To double check the robustness of the results, Phillips and Perron (1988) test of stationarity has also been performed for the series. Vector Error Correction Model is used to deeply understand short term dynamics between GDP and Exports and to add robustness of VEM results Variance Decomposition Analysis is also done.

SECTION IV: ANALYSIS AND INTERPRETATION:

To examine the relationship of GDP and Exports, the first we calculated stationarity of data. Results are exhibited in Table 1, which clearly exhibits non-stationarity of both the variables i.e. they are integrated to order 1 using ADF test. To add robustness Philip Perron Test is also done which gives the same results.

<table>
<thead>
<tr>
<th>ORIGINAL SERIES (Panel A)</th>
<th>RETURN SERIES (Panel B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF (T-STATS)</td>
<td>PHILIP PERRON (T-STATS)</td>
</tr>
<tr>
<td>Exports -1.09</td>
<td>-0.51</td>
</tr>
<tr>
<td>GDP 0.78</td>
<td>0.65</td>
</tr>
</tbody>
</table>

The table 1 describes the sample price series that have been tested using Augmented Dickey Fuller (ADF) 1981. The ADF test uses the existence of a unit root as the null hypothesis. To double check the robustness of the results, Phillips and Perron (1988) test of stationarity has also been performed for the series and then both the test are performed on return series also as shown in Panel-A (price series) and Panel B (Return Series) are integrated to I (1). All tests are performed using 5% level of significance (**).

The association between sample data is examined using co-integration (Johansen, 1991) analysis that has several advantages. First, co-integration analysis reveals the extent to which two markets move together towards long run equilibrium. Secondly, it allows for divergence of respective markets from long-run equilibrium in the short run. The co-integrating vector identifies the existence of long run
equilibrium, while error correction dynamics describes the price discovery process (LEAD LAG) that helps the markets to achieve equilibrium (Schreiber and Schwartz, 1986). Co-integrating methodology fundamentally proceeds with non-stationary nature of level series and minimizes the discrepancy that arises from the deviation of long-run equilibrium. The observed deviations from long-run equilibrium are not only guided by the stochastic process and random shocks in the system. Theoretically it is claimed that if sample series are co-integrated, then it implies presence of causality at least in one direction. On the other hand, if some level series are integrated of the same order, it does not mean that both level series are co-integrated. Co-integration implies linear combinations of both level series cancelling the stochastic trend, thereby producing a stationary series. Johansen’s co integration test is more sensitive to the lag length employed. Besides, inappropriate lag length may give rise to problems of either over parameterization or under parameterization. The objective of the estimation is to ensure that there is no serial correlation in the residuals. Here, Akaike information criterion (AIC) is used to select the optimal lag length see Table 2

**TABLE 2: VAR LAG ORDER SELECTION CRITERIA**

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>26.76697</td>
<td>NA</td>
<td>0.000729</td>
<td>-1.547935</td>
<td>-1.456327</td>
<td>-1.517570</td>
</tr>
<tr>
<td>1</td>
<td>80.45924</td>
<td>97.31724</td>
<td>3.27e-05</td>
<td>-4.653702</td>
<td>-4.378877</td>
<td>-4.562605</td>
</tr>
<tr>
<td>2</td>
<td>84.53327</td>
<td>6.874921</td>
<td>3.27e-05</td>
<td><strong>-4.658329</strong></td>
<td>-4.200287*</td>
<td>-4.506501</td>
</tr>
<tr>
<td>3</td>
<td>120.1119</td>
<td>55.59158*</td>
<td>4.58e-06*</td>
<td>-6.631992</td>
<td>-5.990733</td>
<td>-6.419433*</td>
</tr>
</tbody>
</table>

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

All related calculations have been done embedding that lag length. The co-integration results are reported in Table 3.

The results confirm the co integration between GDP and Exports, see Table 3. P value of both the sample series are significant at 5 % level. This clearly exhibits long term relationship between the two.

**Table 3: Results of Johansen's Co-Integration Test**

<table>
<thead>
<tr>
<th>Name of variable</th>
<th>Lag Length</th>
<th>Max Eigen Value</th>
<th>Trace Statistics</th>
<th>Critical Value</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports</td>
<td>2*</td>
<td>0.516613</td>
<td>24.96919</td>
<td>15.48471</td>
<td>0.0016</td>
</tr>
<tr>
<td>GDP</td>
<td></td>
<td>0.335333</td>
<td>8.986494</td>
<td>3.831466</td>
<td>0.0028</td>
</tr>
</tbody>
</table>

This table provides the Johansen’s co-integration test, maximal Eigen value and Trace test statistics are used to interpret whether null hypothesis of r=0 is rejected at 5 % level and not rejected where r=1. Rejection of null hypothesis implies that there exists at least one co-integrating vector which confirms a long run equilibrium relationship between exports and GDP. The null hypothesis is rejected which reveals that two co-integration relationship exists between them.
To understand short term dynamics between the sample series i.e. to know the level of adjustment between them VECM (error correction mechanism is done to know the short term dynamics between the sample series). The results are exhibited in Table 4. The results reveal that ECT of GDP is greater in magnitude compared to Exports i.e. Exports are playing a lead role and is impacting exports although co integration equation both exports and GDP have significant ECT i.e. both participate in the adjustment process, to attain equilibrium.

### Table 4: VECTOR ERROR CORRECTION ESTIMATES

Standard errors in ( ) & t-statistics in [ ]

<table>
<thead>
<tr>
<th>Co integrating Eq:</th>
<th>CointEq1</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNINDIAEXPORTS(-1)</td>
<td>1.000000</td>
</tr>
<tr>
<td>LNGDPF(-1)</td>
<td>0.968531</td>
</tr>
<tr>
<td></td>
<td>(0.16106)</td>
</tr>
<tr>
<td></td>
<td>[-6.01361]</td>
</tr>
<tr>
<td>C</td>
<td>-1.755579</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error Correction:</th>
<th>D(LNINDIAEXPORTS)</th>
<th>D(LNGDPF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CointEq1</td>
<td>0.123831</td>
<td>0.456240</td>
</tr>
<tr>
<td></td>
<td>(0.10356)</td>
<td>(0.00878)</td>
</tr>
<tr>
<td></td>
<td>[2.19578]</td>
<td>[2.20359]</td>
</tr>
<tr>
<td>D(LNINDIAEXPORTS(-1))</td>
<td>0.271800</td>
<td>0.016808</td>
</tr>
<tr>
<td></td>
<td>(0.21520)</td>
<td>(0.01825)</td>
</tr>
<tr>
<td></td>
<td>[1.26302]</td>
<td>[0.92095]</td>
</tr>
<tr>
<td>D(LNINDIAEXPORTS(-2))</td>
<td>0.014465</td>
<td>0.054679</td>
</tr>
<tr>
<td></td>
<td>(0.21490)</td>
<td>(0.01823)</td>
</tr>
<tr>
<td></td>
<td>[0.06731]</td>
<td>[3.00012]</td>
</tr>
<tr>
<td>D(LNINDIAEXPORTS(-3))</td>
<td>-0.258821</td>
<td>0.046085</td>
</tr>
<tr>
<td></td>
<td>(0.20507)</td>
<td>(0.01739)</td>
</tr>
<tr>
<td></td>
<td>[-1.26210]</td>
<td>[2.64977]</td>
</tr>
<tr>
<td>D(LNGDPF(-1))</td>
<td>1.197305</td>
<td>-0.886680</td>
</tr>
<tr>
<td></td>
<td>(1.06795)</td>
<td>(0.09057)</td>
</tr>
<tr>
<td></td>
<td>[1.12112]</td>
<td>[-9.78980]</td>
</tr>
<tr>
<td>D(LNGDPF(-2))</td>
<td>0.126271</td>
<td>-0.981817</td>
</tr>
<tr>
<td></td>
<td>(0.34907)</td>
<td>(0.02960)</td>
</tr>
<tr>
<td></td>
<td>[0.36174]</td>
<td>[-33.1651]</td>
</tr>
<tr>
<td>D(LNGDPF(-3))</td>
<td>1.688098</td>
<td>-0.877187</td>
</tr>
<tr>
<td></td>
<td>(1.06475)</td>
<td>(0.09030)</td>
</tr>
<tr>
<td></td>
<td>[1.58544]</td>
<td>[-9.71410]</td>
</tr>
<tr>
<td>C</td>
<td>0.022628</td>
<td>-0.065085</td>
</tr>
<tr>
<td></td>
<td>(0.04546)</td>
<td>(0.00386)</td>
</tr>
<tr>
<td></td>
<td>[0.49773]</td>
<td>[-16.8804]</td>
</tr>
</tbody>
</table>
After knowing the VECM results, it is important to understand direction of causality between the sample series. Granger Causality test is conducted and are reported in Table 5. The results show unilateral causality from Exports to GDP, i.e. exports are causing rise in GDP as P Value is less than 0.05 and F Statistics is 6.04175. This confirms that Exports play a key role in increasing GDP, proving our hypothesis of ELG.

**TABLE 5: RESULTS OF GRANGER CAUSALITY TEST**

Pairwise Granger Causality Tests
Lags: 2

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNGDPFPC does not Granger Cause LNINDIAEXPORTS</td>
<td>33</td>
<td>2.45074</td>
<td>0.1045</td>
</tr>
<tr>
<td>LNINDIAEXPORTS does not Granger Cause LNGDPFPC</td>
<td></td>
<td>6.04175</td>
<td>0.0066</td>
</tr>
</tbody>
</table>

**SECTION V: POLICY IMPLICATIONS AND SUGGESTIONS**

As the study concludes that the exports play a crucial role in increasing the GDP of the country, hence various attempts shall be made in order to expand the exports. In order to make Indian exports more competitive in the international market, and to improve level of productivity of Indian export sector, a number of measures, including, the diversification of export commodities, infrastructure development, further more reduction in tariff barriers and quantitative restrictions, increase in the incentives and subsidies to exporters and operationalization of Export Processing Zones (EPZs) are required. It is appropriate to mention that in spite of existence of the positive relationship between the GDP and export growth, there always exists a question that how this development has contributed to the level of income inequalities, impact on poverty reduction and employment generation in India. Consequently, the study suggests that further empirical investigation is required to see the impact of these variables on the overall welfare of the society during the Post-WTO period in general and India in particular.

In 2008-09, global financial meltdown and economic recession in developed economies were the major contributors in India’s economic slowdown. As a result, India’s exports deteriorated by 29.2 per
cent in June 2009. This steep decline was because countries were hit the hardest by the global recession, such as the United States and members of the European Union, account for more than 60 per cent of Indian exports. The later part of 2009 to April 2010, there has been a remarkable outpouring in India’s exports. In April 2010, exports by India reported an increase by 36.2 per cent higher than the level in April 2009. Recently it is further reported that India’s export increased by 23 per cent year-on-year basis in September 2010. Also, it would be pertinent to mention here that bolstered by the measures taken by the government to help exports in the aftermath of the world recession of 2008 and also the low base effect, India’s export growth in 2010-11 reached an all-time high since Independence of 40.5 per cent. Though it decelerated in 2011-12 to 21.3 per cent, it was still above 20 per cent and higher than the compound annual growth rate (CAGR) of 20.3 per cent for the period 2004-05 to 2011-12. However, further investigations are required to resolve such moot point using relatively longer time series, and incorporating in the study more number of macro-economic variables that governs the growth of exports by the country as well as the economic growth of the country. All these support the empirical evidence that the long-term trend may not be exports-led growth in India. The policy implication of such empirical evidence may be that the Government of India and other policy-planning bodies should devise prudential norms and policies to make the macro-economic fundamentals of the country strong enough to absorb the external shocks thereby achieving a fast growth of real economic variables to ensure a noticeable surge in the country’s exports. In this direction, increasing domestic and foreign investments in key areas and ensuring price, interest rate, forex and political stabilities would go a long way. Thus, export-led growth appears to be a liberalization phenomenon for India. These findings have implications for other developing economies that aspire to grow fast but confront dilemmas with trade liberalization policy.

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