Globalization and Economic Asymmetries

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Abstract

The impact of globalization has been so deep and diverse that the different groups of people have different notions of globalization. Economic growth is primarily the result of gains from trade, capital investment, and the discovery of improved products, lower-cost production methods and better ways of doing things. Globalisation opens up these opportunities for the participating countries. The paper presents the various dimensions of globalization. The paper then develops econometric model to access the impact of Globalisation on the indices constructed on the basis of four variables such as merchandies trade, GDP per capita, GNI per captia adjusted with PPP and trade balance. The paper also discusses the underlying dynamics, the stages and process of globalization in general and in particular India as a developing country.

The paper tries to understand the current status of globalization and its impact on income and development at global level with the help of econometric analysis. Our empirical analysis is based on techniques of vector autoregressive (VAR) methods, namely, Granger causality (henceforth GC) and impulse response (henceforth IR) analyses.

Key Words: Globalization, Asymmetries, Economic development, Developing Countries, vector autoregressive, Granger causality, impulse response

Globalisation

The pace of globalisation has accelerated in the last 20 years and most economies in the world are now strongly linked together by flows of trade, finance, factors of production, transport, communication links. However, the forces of globalisation are largely unregulated; for example the magnitude, speed and volatility of financial flows have increased the financial deregulation in many OECD countries. Similar institutional changes have been transmitted to developing economies, particularly as IMF conditionality and World Bank assistance have created pressure for developing countries to liberalize their economies and financial systems and to remove barriers to trade. (Michelle Baddeley,2006) .

Positives and negatives of Globalisation:

In terms of the prospects for developing economies, it is argued by some that globalisation, by promoting trade and allowing easy access to international capital markets, promotes infrastructure development and export led growth in developing economies. Das (2005) extends this idea by developing a theoretical model to capture the impacts of marginal trade

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liberalisation on the North–South divide and concludes that inequality decreases with the liberalisation that accompanies globalisation. Bhagwati (2004) and Loungani (2005) argue that globalization has encouraged competition, has allowed countries to exploit economies of scale, has encouraged macroeconomic stability and has promoted foreign direct investment (FDI). All have benefited less developed countries. Bhagwati presents evidence to show that the consequent impact of increasing trade flows in enhancing economic growth has translated into reduced international poverty. A number of studies challenges the positive view of globalisation. The critiques have two views. Some authors argue that globalisation has the potential to help developing nations but rigidities limit the spreading of benefits; others develop a centre-periphery analysis in arguing that globalisation has had a negative impact because it has served the interests of the rich countries in the North essentially at the expense of the South.

Milanovic (2003) completely rejects the view of globalisation as a benign force, presenting evidence that, since 1870, globalisation has exacerbated international inequality during the 1978– 1998 globalisation era. He argues that the impacts on less developed countries have been severe: per capita GDP has not increased in Africa; a number of less developed countries have suffered the impacts of financial crisis and many transition economies are facing historically unprecedented levels of debt. Cornwall & Cornwall (2001) and Setterfield (2003) argue that globalisation will exacerbate distributional conflicts, whilst the moves towards financial liberalization mentioned above contributed to the easy flow of capital across national boundaries. Singh (2003) presents empirical evidence showing that capital account liberalization has made banks more vulnerable to external shocks and now economies more susceptible to financial crisis. So the social and economic costs of financial crisis have been exacerbated by the inter-connectedness of nations. In terms of labour market outcomes, Wood (1998) and Feenstra (1998) show that there have been widening gaps between skilled and unskilled labour both in terms of wages and in terms of unemployment rates and argues that globalisation is the most likely explanation for this rising inequality.
Preble (2010) examined the myth and reality of these two opposing positions on four key areas of the globalization debate, jobs, inequality and poverty; national sovereignty and cultural diversity; and the natural environment. This information is then utilized to derive a broad set of feasible policy recommendations that could help bring about a more sustainable form of globalization

Analysis: Variables selection

With a objective of understanding the current status of globalization and its impact on income and development indices at global level we take the following variables:

The phenomenon of globalization, which has been debated since the 1990s, usually refers to the rising trade and financial integration of the global economy in an economic framework. Based on this definition, economists usually measure globalization using several quantitative indices such as ratio of imports and exports to GDP or the Currency Broad Index. (Kose, Prasad and Terrones, 2003; Lee, Peek and Rensel, 2008). In general, when using these measures, a higher index indicates greater globalization. Those qantitative indicators tend to be good measuring instruments as they capture most of the characteristic phenomenon of globalization from an economic perspective. However, considering a broader view, globalization should not be regarded solely as the change in economic trends. Globalization encompasses not only the economic activities, but also contains technological, political, communication and cultural dimensions (Kellner, 2002). Thus we take Merchandise exports (current US$) (sourced from World Bank) and **Merchandise trade (% of GDP)** (sourced from World Bank) as our variables.

Zhao, Renzel anf Zhee (2009) suggested a globalization measurement method that applies the well accepted Purchase Price Parity (PPP) ratio in a new manner and extends the prior work of Patel (1990) to include in the model such dimensions as international trade cost, short-term and random impacts, the anticipation of exchange factor and its trend.

A free market economy provides more freedom for economic activities and fewer handicaps and barriers among markets in different countries and regions (Fukuyama, 1992; Friedman, 1999). If it is true, then

the international market should develop and follow a no-arbitrage and *one price law*, which is identical to the basis of Purchasing Power Parity (PPP), a fundamental theory in international economics. This leads us to suggest that the PPP function reflects the globalization functions, thus we should be able to measure the level of globalization through the strength of PPP between countries. The PPP principle is the central theoretical proposition of exchange rate theory in international economics (Barro, 1984; Patel, 1990). PPP posits that the exchange rate between two countries should equal the ratio of the two countries' price level of a fixed basket of goods and services. Therefore, when a country's domestic price level is increasing (for example a country experiences inflation) that country's exchange rate must depreciate in order to return to PPP.

Thus we take **GNI per capita based on purchasing power parity (PPP) as another variable for our study .** PPP GNI is gross national income (GNI) converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GNI as a U.S. dollar has in the United States. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. Data are in current international dollars. Zhao, Renzel anf Zhee (2009) used PPP as economic proxy for globalization and we can measure the trend and circumstances of globalization by analyzing PPP. We measure inequality with the standard deviation of the logarithm of per capital income, a measure of inequality across nations widely used in the literature (see Barro and Sala-i-Martin, 1995)

Other variable as a indicator of growth is **GDP per capita (current US$);** GDP per capita is gross domestic product divided by mid year population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data on GD per capita in current U.S. dollar are (sourced from World Bank) and **Trade Balance** are sourced from UNCTAD. To consider the impact of globalisation the variable of Trade Balance for the selected countries has been considered.

Methodology and Findings:

The method adopted in our work is to apply econometric time series analysis to measure the degree of globalization using as large a set of countries as data allow. Our empirical analysis is based on techniques of vector autoregressive (VAR) methods, namely, Granger causality (henceforth GC) and impulse response (henceforth IR) analysis.

As is well known, Granger causality is a test of statistical precedence in which joint significance of lagged values of one variable, say *xt* is tested on a dependent variable *yt*. The test is based on the (Ordinary Least Squares) OLS regression of *yt* on lagged values of both *xt* and *yt*. The null hypothesis of "*xt* does not Granger-cause *yt*" is rejected if the *F*-test (or asymptotically a Chi-squared tests) of the joint significance of the coefficients of *xt*'s" is rejected.

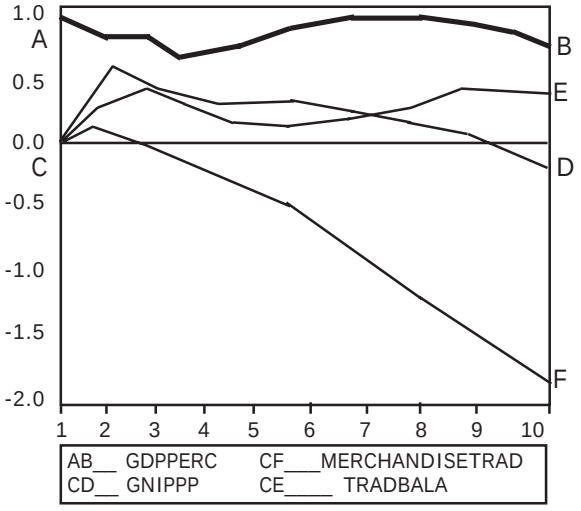
In that case, one would conclude that *xt* Granger-causes *yt* in the sense of statistical precedence. The causality tests can easily be extended to a system of equations (such as a VAR) with more than two variables, and pair-wise causality tests can be constructed between any two series.

Granger causality tests only provide direction of causality between two (or two groups of) variables. They do not reflect whether the causality is negative or positive in the sense that whether one variable causes another variable to rise or fall over time. In general, if *xt* Granger causes *yt*, then for a small change in *xt* at time *t*, all the coefficients of the lagged values of *xt* should jointly determine the changes in the future values of *yt*.

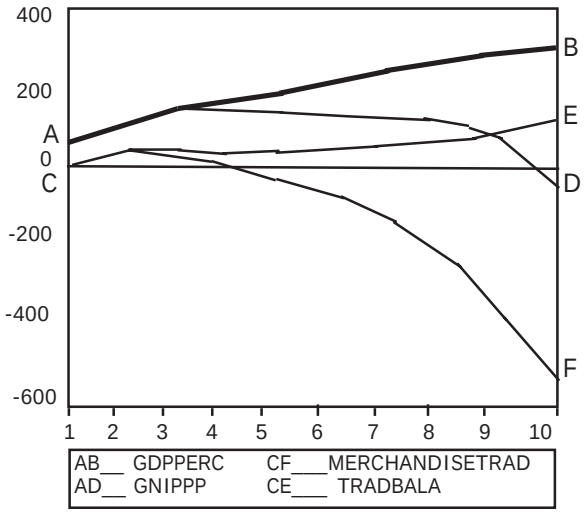
As a first step, we tested each of our variables and globalization for possible nonstationary behaviour using the augmented Dickey-Fuller (ADF) tests. The result of ADF test are given in the Annexure. The unit root properties of the series are needed to determine the maximum order of integration. Our results for the Granger causality tests are shown in Table 1 below.

Secondly we use vector autoregression (VAR) model for multivariate time series. It is used for structural inference and policy analysis. In structural analysis, certain assumptions about the causal structure of the data under investigation are imposed, and the resulting causal impacts of unexpected shocks or innovations to specified variables on the variables in the model are summarized. These causal impacts are usually summarized with impulse response functions and forecast error variance. We can test Granger causality by running a VAR on the system of equations and testing for zero restrictions on the VAR coefficients. The Granger (1969) approach to the question of whether *x* causes *y* is to see how much of the current *y* can be explained by past values of *y* and to see whether adding lagged values of *x* can improve the explanation. The *y* is said to be Granger-caused by *x* if *x* helps in the prediction of *y*, or equivalently if the coefficients on the lagged *x*'s are statistically significant. The standard method for determining the impulse responses in a VAR system is as follows. Defining the VAR in the levels of the variables, one gives unit shocks to each of the system equations and then traces the responses of all the variables for the future time periods. Generally, impulse responses are the dynamic effects of the changes in the variables in a system. The results are shown in Annexure (table 2) with its estimation command. The R^2 for the used variable and models with the estimation commands is found to be (0.971198, 0.998183, 0.993291 an 0.499262) The Impulse response are shown below in Figure 1.

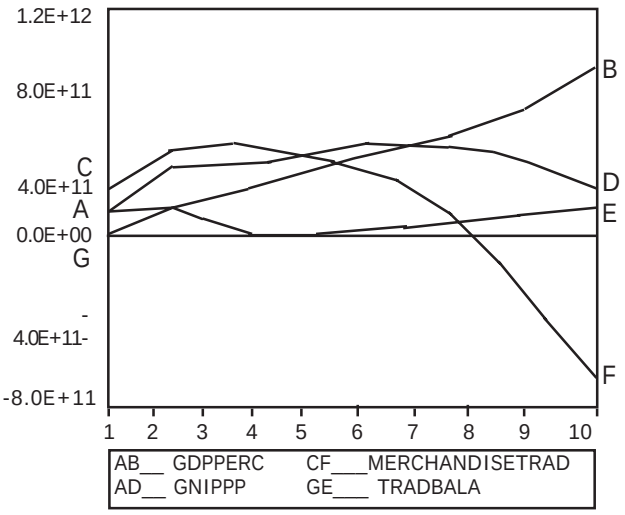
Fig. 1 : Response of GDPPERC to One S.D. Innovations



Response of GNIPPP to One S.D. Innovations



Response of MERCHANDISETRAD to One S.D. Innovations



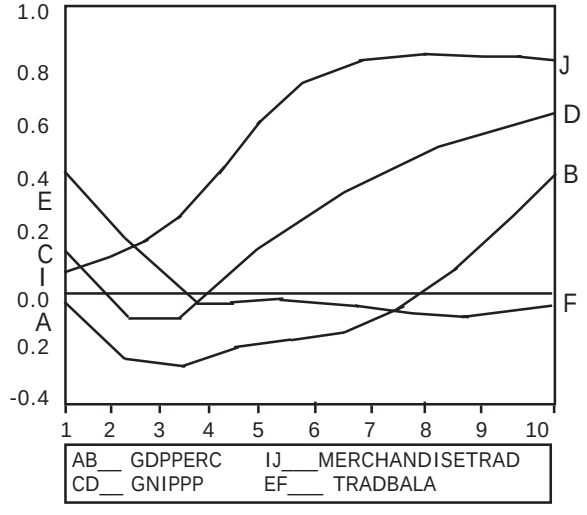


Table 1 :

Pairwise Granger Causality Tests
Sample : 1970-2009
Lags : 1

Null Hypothesis :	Obs	F-Statistic	Probability
GNIPPP does not Granger Cause GDPPERC	29	2.88986	0.10107
GDPPERC does not Granger Cause GNIPPP		0.42146	0.52190
MERCHANDISETRAD does not Granger Cause GDPPERC	39	7.6E-05	0.99310
GDPPERC does not Granger Cause MERCHANDISETRAD		0.54415	0.46550
TRADEBALA does not Granger Cause GDPPERC	38	1.40639	0.24364
GDPPERC does not Granger Cause TRADEBALA		0.73884	0.39588
MERCHANDISETRAD does not Granger Cause GNIPPP	29	1.60845	0.21595
GNIPPP does not Granger Cause MERCHANDISETRAD		7.72928	0.00997
TRADEBALA does not Granger Cause GNIPPP	28	0.04466	0.83434
GNIPPP does not Granger Cause TRADEBALA		1.49500	0.23284
TRADEBALA does not Granger Cause MERCHANDISETRAD	38	0.06545	0.79958
MERCHANDISETRAD does not Granger Cause TRADEBALA		0.01526	0.90238

Above table shows the dual relationship between the various variables which states that GDP and GNI influence each other moderately at global level. As the trade grows GDP increases with good probability but the distribution for the reverse remains uneven. Trade balance and GDP also cause each other moderately, the probabilities are nor very high neither very low. As the GNI increases it leads to a decent demand increase for goods all over the globe and the high consumption leads to further global trade. Trade balance has no clear effect on GNI. As the trade balance increases, economies work for its improvement which leads to further higher exports.

Future Research:

This paper is still a working paper. Further research on globalization index, development index and inequality index can be developed in future. More analysis with geographical income distribution patterns can be done with the help of data. This paper has not provided polcy implications and discussion. We intend to do it in future. More variables can be identified from the various literature and data sources and VAR can be implemented to have a much improved model.

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Annexure:

1. Descriptive for the data set:

Sample: 1970-2009

	GDPPERC	GNIPPP	MERCHAN TRADEBAL	DISETRADA
Mean	34.55000	5934.567	4.43E+12	-2.494263
Median	32.50000	5448.000	3.26E+12	-2.607659
Maximum	53.00000	10676.00	1.61E+13	-0.672181
Minimum	21.00000	2728.000	3.04E+11	-3.795512
Std. Dev.	**7.448800**	**2338.252**	**4.01E+12**	**0.750381**
Skewness	0.597706	0.614957	1.295369	0.395567
Kurtosis	3.334420	2.381727	3.953093	2.381157
Jarque-Bera	2.568077	2.368690	12.70051	1.639398
Probability	0.276917	0.305946	0.001746	0.440564
Observations	40	30	40	39

2.Standard errors & t-statistics in parentheses

Sample(adjusted): 1982-2008

Included observations: 27 after adjusting endpoints

Standard errors & t-statistics in parentheses

	GDPPERC	GNIPPP	MERCHAN TRADEBAL	DISETRADA
GDPPERC(-1)	0.235421 (0.37181) (0.63317)	-6.221648 (28.7533) (-0.21638)	-2.08E+11 (9.9E+10) (-2.10732)	-0.020902 (0.15863) (-0.13176)
GDPPERC(-2)	**0.580416** (0.32766) (1.77138)	**25.11862** (25.3392) (0.99130)	2.08E+11 (8.7E+10) (2.38957)	-0.105111 (0.13980) (-0.75188)

GNIPPP(-1)	0.008828 (0.00729) (1.21032)	1.606529 (0.56407) (2.84812)	1.87E+09 (1.9E+09) (0.96172)	-0.004401 (0.00311) (-1.41419)
GNIPPP(-2)	-0.005989 (0.00651) (-0.92037)	-0.470699 (0.50324) (-0.93533)	-1.41E+09 (1.7E+09) (-0.81522)	0.003566 (0.00278) (1.28435)
MERCHAN DISETRAD(-1)	7.10E-13 (1.2E-12) (0.61477)	7.04E-11 (8.9E-11) (0.78923)	1.579949 (0.30707) (5.14516)	5.27E-13 (4.9E-13) (1.07097)
MERCHAN DISETRAD(-2)	-2.32E-12 (1.3E-12) (-1.74568)	-1.86E-10 (1.0E-10) (-1.81182)	-0.818510 (0.35328) (-2.31691)	4.48E-13 (5.7E-13) (0.79050)
TRADEBALA(-1)	0.882089 (0.57014) (1.54713)	50.21605 (44.0911) (1.13892)	2.08E+11 (1.5E+11) (1.37188)	0.395491 (0.24325) (1.62584)
TRADEBALA(-2)	0.111922 (0.52897) (0.21158)	-33.99497 (40.9071) (-0.83103)	-1.49E+11 (1.4E+11) (-1.05719)	-0.119912 (0.22569) (-0.53132)
C	-0.354805 (5.68962) (-0.06236)	-739.1487 (439.996) (-1.67990)	-1.32E+12 (1.5E+12) (-0.87517)	3.601471 (2.42749) (1.48362)
R-squared	0.980060	0.998742	0.995355	0.653335
Adj. R-squared	**0.971198**	**0.998183**	**0.993291**	**0.499262**
Sum sq. resids	24.70479	147744.7	1.75E+24	4.497057
S.E. equation	1.171533	90.59824	3.12E+11	0.499836
Log likelihood	-37.11201	-154.5113	-747.4010	-14.11376
Akaike AIC	-36.44534	-153.8446	-746.7343	-13.44709

Schwarz SC	-36.01339	-153.4127	-746.3024	-13.01514
Mean dependent	36.96296	5988.519	5.66E+12	-2.574852
S.D. dependent	6.903073	2125.172	3.81E+12	0.706355
Determinant Residual Covariance	1.28E+25			
Log Likelihood	-933.6986			
Akaike Information Criteria	-931.0320			

ADF Test Statistic	-2.003923	1% Critical Value* 5% Critical Value 10% Critical Value	-3.6117 -2.9399 -2.6080

3. ADF for Merchandise trade (% of GDP)

ADF Test Statistic	-2.003923	1% Critical Value* 5% Critical Value 10% Critical Value	-3.6117 -2.9399 -2.6080

*MacKinnon critical values for rejection of hypothesis of a unit root.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDPPERC)
Method: Least Squares

Sample(adjusted): 1972-2009
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPPERC(-1)	-0.128257	0.064003	-2.003923	0.0529
D(GDPPERC(-1))	0.189483	0.256047	0.740033	0.4642
C	4.821996	2.211167	2.180747	0.0360

R-squared	0.103381	Mean dependent var	0.526316
Adjusted R-squared	0.052145	S.D. dependent var	2.758151
S.E. of regression	2.685276	Akaike info criterion	4.889101
Sum squared resid	252.3748	Schwarz criterion	5.018384
Log likelihood	-89.89291	F-statistic	2.017757
Durbin-Watson stat	*1.593161*	*Prob(F-statistic)*	*0.148130*
Schwarz Criteria	-929.3042		

4.ADF for GNI per capita, PPP (current international $)

ADF Test Statistic	-0.148617	1% Critical Value*	-3.6852
		5% Critical Value	-2.9705
		10% Critical Value	-2.6242

*MacKinnon critical values for rejection of hypothesis of a unit root.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GNIPPP)
Method: Least Squares

Sample(adjusted): 1982 2009
Included observations: 28 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GNIPPP(-1)	-0.003165	0.021299	-0.148617	0.8830
D(GNIPPP(-1))	0.748893	0.272906	2.744141	0.0111
C	79.14491	80.81129	0.979379	0.3368

R-squared	0.452290	Mean dependent var	273.1071
Adjusted R-squared	0.408473	S.D. dependent var	179.6198
S.E. of regression	138.1470	Akaike info criterion	12.79547
Sum squared resid	477114.9	Schwarz criterion	12.93821
Log likelihood	-176.1366	F-statistic	10.32230
Durbin-Watson stat	1.120855	Prob(F-statistic)	0.000539

5.ADF for merchandise trade

ADF Test Statistic	-0.132451	1% Critical Value*	-3.6117
		5% Critical Value	-2.9399
		10% Critical Value	-2.6080

*MacKinnon critical values for rejection of hypothesis of a unit root.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MERCHANDISETRAD)
Method: Least Squares
Sample(adjusted): 1972 2009
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MERCHANDISETRAD(-1)	-0.009962	0.075214	-0.132451	0.8954
D(MERCHANDISETRAD(-1))	0.204679	0.497988	0.411011	0.6836
C	2.77E+11	2.32E+11	1.192250	0.2412

R-squared	0.010088	Mean dependent var	3.19E+11
Adjusted R-squared	-0.046479	S.D. dependent var	8.75E+11
S.E. of regression	8.95E+11	Akaike info criterion	57.95329
Sum squared resid	2.80E+25	Schwarz criterion	58.08257
Log likelihood	-1098.113	F-statistic	0.178333
Durbin-Watson stat	1.359726	Prob(F-statistic)	0.837419

6.ADF for trade balance

ADF Test Statistic	-3.100670	1% Critical Value*	-3.6171
		5% Critical Value	-2.9422
		10% Critical Value	-2.6092

*MacKinnon critical values for rejection of hypothesis of a unit root.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRADEBALA)
Method: Least Squares
Sample(adjusted): 1972 2008
Included observations: 37 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADEBALA(-1)	-0.476000	0.153515	-3.100670	0.0039
D(TRADEBALA(-1))	0.092940	0.165231	0.562486	0.5775
C	-1.144671	0.396463	-2.887210	0.0067

R-squared	0.232935	Mean dependent var	0.037941
Adjusted R-squared	0.187814	S.D. dependent var	0.677675
S.E. of regression	0.610730	Akaike info criterion	1.929282
Sum squared resid	12.68170	Schwarz criterion	2.059897
Log likelihood	-32.69171	F-statistic	5.162408
Durbin-Watson stat	2.015911	Prob(F-statistic)	0.011019