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Relationship between Trade Liberalisation, Growth and Balance of Payments in Developing Countries: An Econometric Study

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Relationship between Trade Liberalisation, Growth and Balance of Payments in Developing Countries:An Econometric Study

ABSTRACT

The objectives of this paper are to study the impact of liberalisation on trade deficits and current accounts of developing countries. It is expected that trade liberalisation would promote economic growth from the supply side by leading to a more efficient use of resources, by encouraging competition, and by increasing the flow of ideas and knowledge across national boundaries. Trade liberalisation could lead to faster import growth than export growth and hence the supply side benefits may be offset by the unsustainable balance of payments position. This study uses panel data of 42 countries (both time-series and cross-section dimension) to estimate the effect of trade liberalisation and growth on trade balance while controlling for other factors such as income terms of trade. The major finding of the study is that trade liberalisation promotes growth in most cases, (Part 1 of this study) the growth itself has a negative impact on trade balance and this in turn could have negative impacts on growth through deterioration in trade balance and adverse terms of trade. Our conclusion is that trade liberalisation could constrain growth through adverse impact on balance of payments.

Key Words: Panel data, Income Terms of Trade, Dynamic Optimisation, Dynamic panel model

JEL-Classification: C21, C22, C23, F13, F14, F32

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Introduction

This study extends the previous work (Parikh and Stirbu, 2004) where static models have been used to study the relationship between trade liberalisation and economic growth and the joint impact of liberalisation and growth on trade balance. Our previous models and analysis can be useful to draw certain inferences but otherwise, it was analytically less strong as there existed problems of serial correlation with econometric estimation on panel or time series data. Moreover, specification of trade balance relationship did not consider a multivariate dynamic specification based on optimisation theory in international economics. However, the study highlighted some major sets of variables which can be considered in a dynamic setting. The objectives of this study are to examine the impact of liberalisation, growth and trade policy variables on the trade balance and current account balances in a panel framework for developing countries where the data are for each country over time and these countries are all treated together. We also estimate dynamic models on panel data.

We first define the current account in a more appropriate manner than just the residual from the balance of exports of goods and services less imports of goods and services. A current account deficit can be defined as the country's excess of investment over savings. However, the saving and investment flows reported in many national income accounts do not conform closely to the theoretically correct concepts of saving and investment when international capital mobility is extensive. Historically, current account balances were small in post-1945 period. Initially this was because of official restrictions on international capital movements as most industrialised countries' currencies were inconvertible until 1959. After the early 1970s net international capital flows have expanded as a result of petrodollar recycling, the removal of many industrial country restrictions on international payments following the adoption of floating exchange rates and the technological evolution in the financial industry. This means that we have to consider definition of current account which is sensitive to capital inflows and outflows including service payments.

In section 2 of the paper we provide comparison of the decade 1990s with 1980s in terms of trade balance and economic growth in developing countries and regions of these developing countries. In section 3 we provide a model to link trade balance or current account with the domestic growth. This is based on the consumption smoothing principle for the nation and follows dynamic optimisation under current account constraint. In section 4, the corresponding dynamic model is estimated using dynamic panel data technique. We first allow for the endogenity of growth variable in such a procedure and then we permit other variables to be treated endogenously with growth. In section 5, we attempt regional analysis for two regions namely Africa and Latin America (including Asian countries) and present some of the contrasting features of the results. Since we have only small number of Asian countries in our sample, a separate analysis was not conducted although they form a part of the 42 countries and also of Latin American region. In section 6, we draw some conclusions of the study.

2 Non-fuel exporting developing countries excluding China

We consider the period 1980-1989 decade and compare it with 1990-1999 decade as far as trade balance and current account deficits are concerned for developing countries. There was a strong improvement in external balance of developing countries. While the improvement in the external accounts during the crisis and adjustment period of the early-1980s were associated mainly with import compression and falling growth, the relationship between external account and growth became virtuous and very unusual for the short period between 1983 and 1985 when external accounts improved with rising growth. Then, there was a strong deterioration in the external position between the years 1987–88 and the mid-1990s with a swing back to a deficit level similar to that of the previous decade. Two features of the post-1987 period stand out. (i) The period 1987–90 was characterized by increasing external deficits and slowing growth, i.e. a constellation, which is clearly unsustainable in the long run. During this period many developing countries also underwent a regime change in their trade policy in the sense that they dismantled quantitative restrictions and reduced tariffs, and that they maintained this stance in spite of a worsening trade account. In other words, they stopped using trade

policy measures for balance-of-payments purposes. (ii) Even though economic growth in developing countries picked up moderately after 1990, the rates achieved are associated with higher external deficits (to GDP ratios) than in previous periods. This means that over the past decade there has been an increase in the external financing requirement associated with any given growth rate. As a matter of fact, the relationship between growth and the external position of the past few years mimics that of the period prior to the economic crisis of the early-1980s.

The evolution of the current account position in the non-fuel-exporting-developing countries excluding China has been largely determined by the evolution of their trade and income accounts, while their balances on services and current transfers have not been subject to important changes over the past three decades.[1] The decline in world interest rates since 1989 has reduced the pressure of debt service payments on the current account but this has not translated into lower current-account deficits due to the renewed deterioration in the trade account. Between the 1980s and the 1990s, trade deficits of developing countries increased strongly with the rate of growth remaining by and large unchanged. There are a few notable exceptions from this basic pattern of a similar deficit/GDP ratio and a lower growth rate in the 1990s compared with the decade prior to 1980s:

- the average external trade position of developing countries including the major fuel-exporting countries has worsened throughout the period;
- the group of non-fuel exporting countries in sub-Saharan Africa has experienced a worsening of both its external position and its growth rate;
- the group of non-fuel developing Asia excluding China raised its growth rate while improving its external position during the 1980s; it is the only region for which the relationship in the first half of the 1990s is not substantially different from that in the 1970s.

[1] The GDP-ratio of the services account has fluctuated between 0 and –0.5 per cent, while that of the current transfers has fluctuated between 1.5 and 2.0 per cent. With the fuel-exporting developing countries included, the average services/GDP ratio becomes –0.8 to –3.0 per cent and that of the current transfer/GDP ratio 0 to 0.8 per cent. For detailed empirical evidence, see Table A31 in International Monetary Fund, *World Economic Outlook*, various issues.

Statistical evidence shows that after a continuous increase of both exports and imports of developing countries during the 1970s, their exports stagnated and their imports dropped during the first half of the 1980s. By contrast, both imports and exports have risen strongly since 1986. Looking at regional sub-groups suggests that the drastic improvement in the trade balance of non-fuel developing America during the 1980s were due to a slight increase in exports but mainly due to a very substantial compression of imports. This contrasts sharply with the experience of non-fuel developing Asia excluding China whose trade balance improved in the 1980s due mainly to a very strong increase in exports-contrary to developing America, imports also increased. Hence, while import compression is likely to have choked economic growth in developing America, rising imports were associated with rising growth and rising exports in developing Asia. Sub-Saharan Africa is the other developing region that experienced strong import compression during the 1980s and, contrary to the situation in developing America, this experience has not very much improved over the past few years.

Individual country experience

The external trade position deteriorated in the majority of countries, while the majority of countries experienced rising growth rates between the 1980s and the 1990s. However, 15 out of the 29 countries with a deteriorating external trade position and rising growth between the 1980s and the 1990s are in developing America (Table 1). It is also noteworthy that, between the 1980s and the 1990s, all the developing countries, which have been affected most by the recent financial crisis, (i.e. Brazil, Indonesia, Korea, Malaysia and Thailand) experienced a worsening in their external trade position and thus an increase in their external financing requirements.

A perhaps somewhat surprising feature is that Singapore is the only main exporter of manufactures whose external trade position has improved between the 1980s and the 1990s, while that of Hong Kong, Korea, Malaysia, Mexico, Taiwan, Thailand and Turkey has worsened. It should not be forgotten, however, that exports with a comparatively high-income elasticity of demand encompasses a much broader spectrum than manufactures. Some countries in the sample have been able to increase exports of agro-industrial goods, such as for example Chile, where export earnings from fruit and fishery

and forestry products have, together, come to rival those from copper, and this has helped her to achieve both increased growth and an improved external position between the 1970s and the 1990s.

3 Theoretical base of current account and GDP growth relationship

In this section we propose a dynamic model to study the relationship between GDP growth and trade balance to GDP ratios. This theoretical model is largely for developed countries but it provides the framework for the relationship between trade balance and GDP growth rates when debt-GDP ratio is constant.

We consider a small open economy inhabited by a representative agent with an infinite time horizon. The economy starts in period t and continues forever. We normalize population size to unity. The utility function for infinite period is

$$U(t) = \sum_{s=t}^{\infty} \beta^{s-t} U(C_s) \qquad (3.1)$$

where C_s is consumption in period s and β is the discount rate. Deriving the t period-budget constraint, the current account with constant interest rate is

$$CA_t = B_{t+1} - B_t = Y_t + rB_t - C_t - G_t - I_t \qquad (3.2)$$

where CA is current account, B is net foreign assets accumulated on prior dates, I is investment and is equivalent to changes in capital stock, C is consumption, G is government expenditure, *t* refers to the time period.

There is an accounting equivalence between the net export surplus in current account and the negative value of the capital account. The current account balance as defined in equation (3.2) is the changes in net foreign assets position between two periods.

If output is determined by Y= AF(K) i.e. output is a function of capital K (accumulated over previous periods) with A as the given technology, the utility function after substitution for consumption in period s will be

$$U_t = \sum_{s=t}^{\infty} \beta^{s-t} u\left[(1+r)B_s - B_{s+1} + A_s F(K_s) - (K_{s+1} - K_s) - G_s\right] \qquad (3.3)$$

One finds two necessary conditions for maximizing U_t with respect to B_{s+1} and K_{s+1} for every period $s \geq t$:

$$U'(C_s) = (1+r)\,\beta U'(C_{s+1}) \qquad (3.4)$$

$$A_{s+1} F'(K_{s+1}) = r \qquad (3.5)$$

These are called consumption (Euler) equation (3.4) and the equality between marginal product of capital and the world interest rate (3.5). The relevant infinite-horizon budget constraint[2] is

$$\sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} (C_s + I_s) = ((1+r)B_t + \sum \left(\frac{1}{1+r}\right)^{s-t} (Y_s - G_s) \qquad (3.6)$$

Generally, there are inherent uncertainties that will affect consumption and investment decisions. In a stochastic environment, we make the assumption of rational expectations and can replace the utility maximization over time under certainty with the expected utility maximization over infinite time period corresponding to equation 3.1. Rearranging the budget constraint and writing $TB_s = Y_s - C_s - I_s - G_s$ as the economy's trade balance in equation (3.6) we obtain

$$-(1+r)B_t = \sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} TB_s \qquad (3.7)$$

The trade balance is the net output transferred to foreigners each period. Suppose that $Y_{s+1} = (1+g)\,Y_s$ where $g>0$ is the growth rate in output and that the economy maintains a steady debt-output ratio (B_s/Y_s) so that $B_{s+1} = (1+g)\,B_s$. The current account identity would imply a steady imbalance of $B_{s+1} - B_s = gB_s = rB_s + TB_s$, which yields

$$\frac{TB_s}{Y_s} = \frac{-(r-g)B_s}{Y_s} = \frac{-B_s}{Y_s/r - g} \qquad (3.8)$$

To maintain constant debt-GDP ratio the country needs to pay out the excess of interest over its growth rate. Alternatively, the necessary trade surplus as a proportion of GDP is equivalent to the ratio of the debt to the world market value of a claim to the economy's

[2] This is based on the assumption that the lenders will not permit the individual to die with unpaid debts and it would not be optimal for individual to disappear leaving unused resources. Given the infinite time horizon, the countries are assumed to have the same behaviour as individuals.

entire future. The relationship between trade balance as a proportion to GDP and the country's growth rate is positive.[3] There are, however, possibilities of negative relationship between economic growth and trade balances. This can happen if the behaviour of output is non-stationary.

If output follows a stochastic process

$$Y_{t+1}-Y_t = \varphi\,(Y_t - Y_{t-1}) \qquad (3.9)$$

with $0<\varphi<1$,

then output will be a nonstationary random variable where

$$Y_t = Y_{t-1} + \sum_{s=-\infty}^{t} \varphi^{t-s}\varepsilon_s \qquad (3.10)$$

In the above equation permanent output fluctuates more than current output level. Consumption smoothing implies that an unexpected increase in output causes an even greater increase in consumption. However, a positive output innovation implies a current account deficit.

The other case is one where there is a trend productivity growth and a small developing economy is growing faster than the world economy. In this case, debt-GDP ratio is increasing forever which is unstable. This is because a country is promoting higher growth now at the cost of future economic growth. Under our dynamic framework, debt-GDP ratio could increase if there is a positive output shock or the domestic growth rate[4] is higher than that of the world economy. Productivity shocks[5] can occur through terms

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[3] The slow growing economies are likely to suffer the debt burden in the short-run. In 1991, the slow growing Argentina and Nigeria had external debt as 3.9 per cent and 4.8 per cent of GDP respectively while the fast growing Thailand had the same of the order of 0.2 per cent. (Obstfeld and Rogoff 1997)

[4] It is now a well-known proposition that with integrated global capital markets there can be no intercountry differences in returns to capital (risk-adjusted) and as capital flows to the country where the rate of return is higher the cross-country differences in marginal products of capital would disappear leading to convergence of output per worker. This proposition was empirically tested and a plausible conclusion to draw from the debate is that there is convergence in output per worker but it has been very slow.

[5] In the representative agent model, the higher productivity growth will tend to weaken the current account as people would borrow today against the higher future income. In the overlapping generations

of trade shocks and also through liberalization policy in a developing economy. A temporary deterioration in terms of trade can cause a current account deficit, whereas a permanent deterioration would cause an immediate shift to the new lower consumption level consistent with external balance.

If we assume that the world real rate of interest is not constant but is equal to the growth rate in developed economies then we have a model equation for trade balance to GDP ratio where $CA=B_{s+1}-B_s = rB_s + TB_s$ and the ratio of current account to GDP is equivalent to TB/GDP+rB/GDP = F(GDP growth, Productivity shocks). As productivity shocks are due to terms of trade changes, growth in the developed world and liberalization regimes, we use these as determinants of productivity shocks in trade balance to GDP ratios.

TB/GDP = F (GDP growth, Terms of Trade, Growth in Industrial Countries, Liberalization) (3.11).

We have thus obtained a relationship which can be estimated from the available sample of data. Also, under stochastic framework when output follows a non-stationary path the relationship between trade balance and output growth becomes negative. Liberalisation could introduce non-stationarity in output behaviour which we unfortunately could not investigate with merely 30 observations for each country and in some cases it is even less. Moreover, liberalization could bring structural change and even when unit root hypothesis was not rejected it could be due to the liberalization leading to economy wide changes and repercussions. Hence we have not used unit root tests to discover non-stationarity in output behaviour.

For current account to GDP percentages, we use the world interest rate that is determined by the growth rate in developed countries. So, our estimating equation for CA/GDP is:

CA/GDP=F (World Interest Rate, GDP growth, Terms of Trade, Liberalization) (3.12)

and the World Interest rate is determined by the growth rate in developed economies.

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model, the productivity growth could raise the labour income of young workers but does not affect the wage incomes of the older workers. As young savers will count more heavily in aggregate saving than

In the above relationships, we expect interactions between liberalization and GDP growth and liberalization and terms of trade. The marginal effect of GDP growth on TB/GDP will be negative (or positive according to one view) as developing countries are likely to grow faster than developed countries and their import propensity will be higher than export propensity in the short-run. Moreover, the marginal impact of the terms of trade will be positive as a favourable change in the terms of trade of developing economies will lead to an improvement in TB/GDP ratio. The higher growth in developed economies will improve the trade balance to GDP ratio as the developing countries are likely to export more to the developed world (since growth in the industrialized world creates demand for commodities and raw-materials including intermediate products).

4 Trade balance and growth relationships, structural change and Dynamic Panel Models

We estimated a dynamic model with one and two lags and prefered the model with one lag. All equations were estimated by Generalised Method of Moments. Before these models were estimated we considered static panel data models (without lags) and obtained estimates from fixed effects and random effects models[6]. We write the equation for a dynamic model in the following form:

$$y_{it} = \delta_1 y_{it-1} + \delta_2 y_{it-2} + \mathbf{X}_{it}\mathbf{B} + \alpha_i + \eta_t + \varepsilon_{it} \qquad i = 1, 2\ldots\ldots 42,\ t = 1,2,\ldots\ldots 31 \qquad (4.1)$$

y_{it} is the trade balance or current account to GDP in percentages, $\mathbf{X}_{it}$ is a set of explanatory variables namely liberalization, growth in real GDP, purchasing power of exports (terms of trade), and interactions of liberalisation with purchasing power of exports and of liberalisation with the growth rate in real GDP in developing and developed economies. η_t is the effects of time or year dummies and may be represented as cyclical impacts on trade balance to GDP percentages. When the dependent variable is

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old dissavers, saving will tend to rise and the current account to improve. (Obstfeld 1995).

[6] Results of these can be obtained from the author. These models using panel data analysis differ according to whether they treat intercept parameters as random or fixed across the sample. The estimators in the random effects model are the generalized least squares estimators, and they combine the within and between country estimators using the corresponding residual variances as weights. For elementary panel data techniques see Johnston (1996). For special treatment of panel data models, see Baltagi (1995) and Wooldridge (2002).

current account to GDP percentages, we use the debt related variables namely debt service to payments ratios, annual growth in accumulated long-term debt and percentage change in world interest rates[7].

We expect the sign of the coefficients to be positive with respect to purchasing power of exports and growth in developed economies while we expect negative sign with respect to growth in real GDP and oil prices. Two-year lags are used on the assumption that lags are not likely to be longer.

Even if $y_{it\text{-}1}$ and ε_{it} are not correlated, and t does not approach infinity (t=31 in our case) then estimation by fixed effects or random effects is not consistent even if n (number of countries) goes to infinity. Arellano and Bond (1991) suggest an alternative procedure that corrects not only for the bias introduced by the lagged endogenous variable, but also permits a degree of endogeneity in the other regressors (such as Growth variable on the right hand side variable as a subset of **X** matrix). The Generalized Method of Moments Estimator first differences each variable and then uses the lagged values of each of the variables as instruments. Specifically,

$$\Delta y_{it} = \delta_1 \Delta y_{it-1} + \delta_2 \Delta y_{it-2} + \mathbf{\Delta X}_{it}\mathbf{B} + \Delta \varepsilon_{it} \qquad (4.2)$$

The first three observations are lost due to lags and differencing. Assuming that ε_{it} are not autocorrelated for each i at t=4, y_{i1} and y_{i2} are valid instruments for lagged variables. Similarly, at t=5, y_{i1}, y_{i2} and y_{i3} are valid instruments. We thus estimate the dynamic model using the above procedure.[8]

[7] We expect the current account to deteriorate with an increase in debt, increase in service payments and an increase in world interest rates. Expected signs are negative with respect to each one of them.

[8] Monte Carlo simulation has shown that for panels with t=5 or 6, the bias of the coefficients of lagged dependent variable can be significant, although the bias for the coefficients on other right hand side variables tends to be minor.

Results of Arellano-Bond Estimation on the Whole Sample for the Entire period and sub-Periods

In Tables 2A, 2B and 2C, the results of dynamic models are presented for the period 1980-1999 using a sample data of 42 countries. The panel is unbalanced as we do not have data for all the years for all countries. Data for earlier period were not consistently available and hence we have excluded period 1970 to 1979. Our study is over the period 1980-1999. First differences remove the fixed effects and given the dynamics, we introduce lagged effects on changes in TBGDP1 and CAGDP1 in respective trade balance and current account equations. We sometimes, find that both growth and lagged growth effects are negative on trade balance. (Table 2C). This also confirms that the faster domestic growth effects trade balance adversely. Liberalisation increases current account deficits as in Table 2A. Overall liberalisation deteriorates trade deficits but its effects come through terms of trade interaction with liberalisation. In Table 2A, liberalisation is used as a dummy and also a slope dummy where it is interacting with income terms of trade. This means that liberalisation affects terms of trade and the terms of trade with liberalisation has a negative impact on trade balance. In Table 2B, our results indicate that liberalisation on its own has a negative impact although the coefficient is not significant. Growth in developed world tends to improve trade balance in developing countries while it tends to worsen current account balance according to results of Table 2B. In Tables 2B and 2C time dummies are used while Table 2A does not use time dummies. Time dummies indicate that there are autonomous effects and such effects could be correlated with country-invariant advanced countries' growth rates. The terms of trade have significant positive effects on trade balance but interaction with liberalisation variable has negative effect. (Table 2A).

5. Regional Analysis and Sub-Period Models

It might be worthwhile to look at the results by regions and by sub-periods. Is there any evidence of change in the relationship between trade balance and economic growth between different sub-periods? Our UNCTAD (1999) study demonstrated that the

relationship between trade balance and GDP growth could have changed from one decade to the next. In order to study this aspect we shall examine the estimates of the periods 1980-89 and 1990-99 using the data of as many countries as possible in each of these periods. It is the estimation based on panel data and we use the Blundell-Bond (1998) dynamic panel estimator. We now do not estimate current balance to GDP equation. All results refer to TBGDP1 and they are obtained using System GMM and equation GMM as they are explained in Bond (2000). These results are presented in Tables 3A and 3B. Terms of trade have significant effects on trade balance during 1980-89 period with the two step system GMM. Growth variable does not have significant relationship with TBGDP1 and this means that although the relationship is negative, it does not have harmful effects on trade balance. (Table 3A) Liberalisation on its own does not have significant impact on TBGDP1 during 1980-89 period. There seems to be significant evidence that the relationship between trade balance and GDP growth is negative in 1990-2000 decade while although the relationship is negative, it is not significant for the previous decade (Table 3B). Liberalisation is tending to have negative impact on TBGDP1 during the period 1990-2000. We thus establish that some of the conclusions we mentioned in Section 2 are valid according to the dynamic panel estimator.

Table 4 reports results for African countries for two sub-periods 1980-89 and 1990-99. For the first period, all time dummies were insignificant. We have an unbalanced panel but when observations are differenced out we have very few observations for each decade of 1980-89 and 1990-2000. The lagged dependent variable has a small coefficient although significant. The sign of growth variable for 1990-2000 decade is negative and significant but not for 1980-89 period. Liberalisation has a negative and significant coefficient for the 1990-2000 period and an increase in liberalization may lead to 1.95 percentage point decline in trade balance. For the first period, advanced countries' growth has a significant role to play in improving trade balance. Overall, we find that the relationship is different between two periods and our hypothesis about liberalization[9] and

[9] We used other variations of the equations for Current account and Trade balance variables. Growth was never significantly related to trade balance or current account in the first period. Liberalisation has reduced both trade account and current account balances in Africa in the period 1990-2000. The dominant negative effect on trade balance comes from its interactions with terms of trade. Liberalisation may deteriorate

domestic growth both having deteriorating impacts on trade balance in the 1990-2000 time period, is confirmed.

In Table 5, we use the entire sample for African and Latin American economies. For African economy, growth in advanced country plays a positive and significant role in improving trade balance. This may imply that the behaviour overall is very different between two periods. For Latin American economies, growth has a negative impact on trade balance; an increase in income terms of trade improves trade balance, liberalization is not significant and dynamic model is plausible. Many time dummies for Latin America are significant so there is a great deal of autonomous effect on trade balance and as anticipated, the effect is positive up to 1988 and as we mentioned before this was the period when both trade balance and economic growth improved. The decade of 1990 for Latin America[10] shows a worsening of trade balance and this is captured to some extent in time dummies.

In Table 6, we provide results of Latin American trade balance equations for two different periods. We find that the growth coefficients are not significant for the first period while for the second period they are highly significant and negative suggesting that growth deteriorates trade balance. The growth in advanced countries improves trade balance in Latin American and Asian economies. Terms of trade have positive impact on trade balance in both periods while liberalization on its own is not significant in either period. Again when two periods are studied separately and with the first differencing the number of observations is small. Our System-GMM did not produce significant results on a large number of variables.

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terms of trade as imports expand at a faster rate and import prices might rise faster than export prices leading to deterioration in terms of trade and this in turn could lead to trade balance deterioration. For African economies, liberalisation interacting with growth has a positive impact on trade balance.

[10] We only considered trade balance to GDP and two models, one with time dummies and another without time dummies are estimated. Growth is significantly negatively related to trade balance in both models. What we can infer here is that faster economic growth in Asian and Latin American countries would lead to a decline in trade balance as import growth far exceeds export growth. Surprisingly, growth in advanced countries does not remove pressure on trade balance or current account balance.

6. Summary and Conclusion:

One of the major issues is the capital financing requirements in the presence of trade deficits in the short and medium run for developing economies. Globalisation has made both developing and developed countries highly interdependent. If developing countries were to catch up with developed countries in their per capita income, enormous help from developing countries may be needed from developed countries by way of capital financing. Our study seems to indicate that there are differing patterns on trade deficits across various geographical regions and also during the decade of 1990-1999. Trade liberalization has increased the imports of many developing countries and although after initial phase of import growth exports picked up in some developing countries, on the whole, it remained insufficient to narrow the trade deficits. Rapid liberalisation was sometimes followed by large inflows of capital, currency appreciation and mounting trade deficits, but it often ended up with a crisis involving reversal of capital inflows, collapse and overshooting of exchange rates, sharp cuts of imports and a deep economic contraction.

We find that trade liberalization does have significant relationship with economic growth and/or trade deficits in short to medium-run. Current account deficits have sometimes increased because of trade liberalization in African economies during the period 1980-1999. Our significant relationship between liberalization and trade deficits and economic growth and trade deficits is for Latin American and Asian economies for the latter decade. This seems to indicate that their capital financing requirements are much higher than the world community has been able to provide and rapid liberalization has often caused financial crisis and debt problems in Latin American and some Asian economies.

Our study has many limitations as the data inadequacies dominate the model estimation. The measures of trade liberalization such as Sachs-Warner (1995) or Wacziarg (2001) do not take into account different intensities of liberalization in different time periods. Our study has not considered liberalization attempt by any developed economy. Tariff and non-tariff barriers on a significant scale exist in developed countries for agricultural products emerging from developing economies.

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Table 1
Trade account to GDP ratio and GDP growth: 1989–96 compared with 1982–88

		Improving trade account				Deteriorating trade account			
		More than 10%	5 to 10%	2 to 5%	0 to 2%	0 to 2%	2 to 5%	5 to 10%	More than 10%
Rising Growth	More than 5% growth		*Syria*	*Libya*	*Iran*			Guinea Guyana	Sudan
	3 to 5%	PNG Singapore	Jordan *Trinidad and Tobago*	*Gabon*		**Argentina**	Bolivia	Guatemala Liberia **Malaysia** Nicaragua **Philippines** Uganda	El Salvador
	1 to 3%	Benin *Nigeria*	*Saudi Arabia*	Mali	Niger	*Ecuador*	**Chile** Fiji *Indonesia* **Peru** **Thailand**	*Kuwait* **Mexico**	Mauritania Tanzania
	0 to 1%			*Venezuela*	Bangladesh **Colombia** Sri Lanka Tunisia	Cote d'Ivorie	Dominican Rep. Honduras Jamaica Nepal	Paraguay	
Falling Growth	0 to 1%	Guinea Bissau	*Congo*	CAR **China** Senegal	**India**		Costa Rica Zambia	Malawi	Ghana
	1 to 3%	Burkina Faso		**Pakistan**	*Algeria* Cyprus Morocco	**Brazil** Kenya **Turkey**	Hong Kong **Korea** Madagascar	Mauritius Zimbabwe	Gambia
	3 to 5%		Chad	Togo		Barbados **Egypt** Haiti	Sierra Leone	**Taiwan**	
	More than 5%	Cameroon	*Iraq*			Botswana Democratic Rep of Congo Rwanda	Burundi		

18 big countries in bold (defined as largest GDP in 1990-95 and GDP greater than US $60 billion in 1997 excluding the major oil-exporting countries, as well as Hong Kong, Singapore). 9 major oil exporting countries in italics. 9 main exporters of manufactures underlined.

All data from ETS except data on current GDP are from World Development Indicators for Ghana, India, Jamaica, Malaysia, Mauritania, Nigeria, Papua New Guinea, Rwanda, Sierra Leone, Sri Lanka, Thailand, Trinidad and Tobago, Zimbabwe. As no data on current GDP are available for 1996 for Barbados, Bolivia, Gambia, Iran, Iraq, Liberai, Libya, Saudi Arabia and Sudan, the second period comprises only 1989–95 for these countries.

Table 2A

Regression Coefficients, Z-statistic: Arellano-Bond Dynamic Panel Estimation **1980-99 (42 countries Unbalanced Panel)**

	TBGDP1		CAGDP1	
Name of the Variable	Coefficient	Z-statistic	Coefficient	Z-statistic
TBGDP(-1)	0.7335***	29.44		
CAGDP(-1)			0.5198***	8.00
GROWTH	-0.0346*	-1.93	0.0020	0.12
LIBGROWTH	0.0129	0.43		
PPI	0.0142***	3.35	0.0021	1.69
LIBER	0.3167	0.54	-0.3442*	-1.90
LIBPPI	-0.0104**	-2.35		
ADVGR	0.0018	0.14	0.0234***	3.02
DEBTSR			1.3365	0.78
GLTDOL			-0.0058**	-2.12
CINTEREST			0.0025	1.91
CONSTANT	0.0489**	2.76	0.0373**	2.78
First Order AC	-12.94 (0.000)		-3.04 (0.0024)	
Second Order AC	1.88 (0.0604)		1.22 (0.2208)	
Wald χ^2			247.98 (8 DF)	
Number of Obs	888		849	
Sargan Test χ^2	655.35 (0.00)			

Time Dummies are not used.

***Significant at 1% level, **Signficant at 5% level, *Significant at 10% level

Table 2B
Regression Coefficients, Z-statistic of Arellano-Bond Dynamic Panel Estimation **1980-99 (42 countries Unbalanced Panel) WITH TIME DUMMIES**

	TBGDP1		CAGDP1	
Name of the Variable	Coefficient	Z-statistic	Coefficient	Z-statistic
TBGDP(-1)	0.7406***	20.83		
CAGDP(-1)			0.4665***	8.56
GROWTH	-0.0264	-1.20	0.01236	0.64
GROWTH(-1)				
PPI	0.0058***	3.64	0.0024	1.61
LIBER	-0.5860	-1.39	-0.2705	-0.79
ADVGR	0.0161	0.61	-0.5655**	-2.28
LIBGROWTH	-0.0062	-0.18		
DEBTSR			1.4278	0.90
GLTDOL			0.0053	0.77
CINTEREST			0.0618**	2.31
CONSTANT			1.6625**	2.33
First Order AC	-8.80(0.000)		-3.75(0.0002)	
Second Order AC	1.69(0.0906)		0.72 (0.4687)	
Wald χ^2	698.67 (22DF)		1474.70 (23DF)	
Number of Obs	537		692	
Sargan Test χ^2	322.96(0.000)			

Year Dummies used.
***Significant at 1% level, **Signficant at 5% level, *Significant at 10% level

Table 2C
Regression Coefficients, Z-statistic of Aralleno-Bond Dynamic Panel Estimation **1980-99 (42 countries Unbalanced Panel) WITH TIME DUMMIES**

	TBGDP1		CAGDP1	
Name of the Variable	Coefficient	Z-statistic	Coefficient	Z-statistic
TBGDP(-1)	0.7028***	6.16		
CAGDP(-1)			0.4436***	7.92
GROWTH	-0.0360	-1.32	-0.0123	-0.64
GROWTH(-1)	-0.0335**	-2.23	0.0039	0.45
PPI	0.0141**	2.79	0.0072**	2.38
LIBER	0.7189	1.10	0.4942	1.08
LIBPPI	-0.0053*	-1.79		
ADVGR	0.0569**	2.17	0.0266	1.31
ADVGR(-1)	-0.1083	-3.61	-0.0733***	-3.08
LIBGROWTH				
DEBTSR			1.2015	0.79
GLTDOL			0.0062	0.95
CINTEREST			0.0025	0.84
CONSTANT	0.0351	0.53	0.1315**	2.22
First Order AC	-3.10 (0.0019)		-3.82 (0.0001)	
Second Order AC	1.07 (0.2845)		0.71 (0.48)	
Wald χ^2	359.03 (23 DF)		3025.52 (25 DF)	
Number of Obs	537		692	
Sargan Test χ^2				

Year Dummies used.
***Significant at 1% level, **Signficant at 5% level, *Significant at 10% level

Table 3A
Blundell-Bond Dynamic Panel Estimators with System GMM and Difference GMM for TBGDP1 of 42 Countries, 1980-1989

	System GMM		DIFF-GMM	
Name of the Variable	Coefficient	t-statistic	Coefficient	t-statistic
TBGDP(-1)	0.9127***	20.49	0.7017***	3.41
GROWTH	-0.0400	-1.52	-0.0263	-1.24
PPI	0.0109***	2.12	0.0093	1.37
ADVGR	0.0777	1.61	0.1101	3.28
LIBER	-1.2012	-1.20	-0.8278	-0.89
Year81	-0.3207	-0.41	0.1045	1.12
Year82	1.3381	1.66	1.6162***	3.20
Year84	0.1346	0.36	0.3341	0.84
Year85	0.4103	0.92	0.8166**	2.03
Year86	0.5796	0.90	1.2355***	3.33
Year88	-0.6310	-1.75*	-0.4255	-1.28
Year89	0.2055	0.49	0.1876	0.47
Constant	-1.0411	-1.58	------	
AR(1)	-2.76(0.006)***		-2.31 (0.021)***	
AR(2)	1.05(0.294)		1.09 (0.274)	
Hansen Test	$\chi^2(101)=26.87(1.00)$		$\chi^2(96)=23.68(1.00)$	
No. of Obs.	301		259	

*** Significant at 1% level; **Significant at 5% level, *Significant at 10% level

Notes:

1. Year dummies are included in the second period and as they were insignificant in the first period, they were excluded.
2. Asymptotic standard errors, asymptotically robust to heteroscedasticity are reported in parentheses.
3. First order AC and second order AC are tests of first-order and second-order serial correlation in the first differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.
4. Sargan is a test of over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with degrees of freedom reported in parentheses.
5. The instruments used in each equation are: GMM (DIF)- $TBGDP_{it-2....}TBGDP_{i1}$, $GROWTH_{it-1}….GROWTH_{i1}$, $PPI_{it-1}…..PPI_{i1}$ and $ADVGR_{it-1}…..ADVGR_{i1}$

Table 3B
Blundell-Bond Dynamic Panel Estimators with System GMM and Difference GMM for TBGDP1 of 42 Countries, 1990-2000

	System GMM		DIFF-GMM	
Name of the Variable	Coefficient	t-statistic	Coefficient	t-statistic
TBGDP(-1)	0.9439***	13.98	0.5016***	5.38
GROWTH	-0.0862*	-1.72	-0.1214***	-2.66
GROWTH(-1)	-0.0423	-0.82	-0.1011***	-3.70
PPI	0.0053***	3.17	0.0068**	2.36
ADVGR	0.0054	0.17	-0.0287	-1.28
LIBER	-1.2442	-1.13	-1.1325	-1.55
Year2	-0.3207	-0.41	-0.1405	1.39
Year3	1.3381	1.66	-0.2950	-0.74
Year4	0.1346	0.36	-0.3708	-1.28
Year5	0.4103	0.92	0.5598*	1.75
Year6	0.5796	0.90		
Year7			0.3268	0.95
Year8	-0.6310	-1.75*		
Year9	0.2055	0.49	0.0695	0.22
Year10	-0.1174	-0.20	0.0965	0.21
Constant	-1.0411	-1.58	------	
AR(1)	-2.76(0.006)***		-2.59 (0.01)***	
AR(2)	1.05(0.294)		-1.05(0.293)	
Hansen Test	$\chi^2(101)=26.87(1.00)$		$\chi^2(112)=19.54(1.00)$	
No. of Obse	301		226	

*** Significant at 1% level; **Significant at 5% level, *Significant at 10% level

Notes:

1. Year dummies are included in the second period and as they were insignificant in the first period, they were excluded.
2. Asymptotic standard errors, asymptotically robust to heteroscedasticity are reported in parentheses.
3. First order AC and second order AC are tests of first-order and second-order serial correlation in the first differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.
4. Sargan is a test of over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with degrees of freedom reported in parentheses.
5. The instruments used in each equation are: GMM (DIF)- $TBGDP1_{it2....}TBGDP1_{i1}$, $GROWTH_{it-2}….GROWTH_{i1}$, $PPI_{it-1}…..PPI_{i1}$ and $ADVGR_{it-1}…..ADVGR_{i1}$. In system-GMM, the above instruments are used in the differenced equations and $\Delta TBGDP1_{it-1,}$ $\Delta GROWTH_{it-1,}$ $\Delta ADVGR_{it-1}$, and ΔPPI_{it-1}

Table 4

Regression Coefficients, t-statistic of Bond-Blundell Dynamic Panel Estimation 1980-2000: AFRICA: With or Without Time Dummies

	TBGDP1:1980-89 One Step DIF-GMM		TBGDP1 1990-2000 One Step DIF-GMM	
Name of the Variable	Coefficient	t-statistic	Coefficient	t-statistic
TBGDP(-1)	0.3494***	3.92	0.2903*	1.73
GROWTH	-0.0073	-0.26	-0.0718	-1.52
GROWTH (-1)	-0.0115	-0.42	-0.1128**	-2.31
PPI	0.0176**	2.57	-0.0004	-0.12
LIBER	-0.3272	-0.60	-1.9490**	-2.42
ADVGR	0.0716**	2.06	0.0253	0.56
Year 92			-1.3665**	-2.20
Year 93			-1.6351**	-2.77
Year 94			-0.3903	-0.66
Year 96			-0.1397	-0.17
Year 97			-0.1139	-0.17
Year 98			-1.0755*	-1.70
Year 99			0.2431	0.36
CONSTANT	----	----	------	-----
First Order AC	-2.92 (0.004)		-1.40 (0.162)	
Second Order AC	-1.12 (0.26)		-0.16 (0.871)	
Number of Obs	77		35	
Sargan Test χ^2	76.68(0.115)		46.89	

*****Significant at 1% level, **Significant at 5% level and * Significant at 10% level**

Notes:

6. Year dummies are included in the second period and as they were insignificant in the first period, they were excluded.
7. Asymptotic standard errors, asymptotically robust to heteroscedasticity are reported in parentheses.
8. First order AC and second order AC are tests of first-order and second-order serial correlation in the first differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.
9. Sargan is a test of over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with degrees of freedom reported in parentheses.
10. The instruments used in each equation are: GMM (DIF)- $TBGDP_{it-2....}TBGDP_{i1}$, $GROWTH_{it-2}$….$GROWTH_{i1}$, PPI_{it-1}…..PPI_{i1} and $ADVGR_{it-1}$…..$ADVGR_{i1}$

Table 5 : Regression Coefficients, t-statistic Bond-Blundell Dynamic Panel Estimation: AFRICA and Latin America for 1980-2000

	AFRICA		LATIN AMERICA	
Name of the Variable	Coefficient	t-statistic	Coefficient	t-statistic
TBGDP(-1)	0.6066***	9.34	0.6769***	6.00
GROWTH	0.0105	0.42		
GROWTH(-1)	-0.0033	-0.14	-0.0700***	-4.11
PPI	0.0038	0.99	0.0062***	3.31
LIBER	-0.4239	-0.77	-0.0717	-0.27
ADVGR	0.1185**	2.38	0.0285*	1.71
Year 3			1.9878***	3.79
Year 4			1.2090**	2.93
Year 5			1.9316**	2.81
Year 6			1.6710***	3.42
Year 7			1.7521***	3.90
Year 8			1.1654**	2.25
Year 9			1.6514***	4.29
Year 10			0.8303**	2.68
Year 13[a]	-1.4840**	-1.97		
CONSTANT			0.0088	0.15
First Order AC	-4.36 (0.000)			
Second Order AC	1.14 (0.255)			
Number of Obs	139			
Sargan Test χ^2	131.23 (0.064)			

[a] Only significant year effects are reported ***Significant at 1% level, **Significant at 5% level, *Significant at 10% level

Notes:

1. Year dummies are included in the second period and as they were insignificant in the first period, they were excluded.
2. Asymptotic standard errors, asymptotically robust to heteroscedasticity are reported in parentheses.
3. First order AC and second order AC are tests of first-order and second-order serial correlation in the first differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.
4. Sargan is a test of over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with degrees of freedom reported in parentheses.
5. The instruments used in each equation are: GMM (DIF)- $TBGDP_{it-2....}TBGDP_{i1}$, $GROWTH_{it-2}$….$GROWTH_{i1}$, PPI_{it-1}…..PPI_{i1} and $ADVGR_{it-1}$…..$ADVGR_{i1}$

Table 6

Regression Coefficients, t-statistic Bond-Blundell Dynamic Panel Estimation 1980-99: Latin America and Asia

	TBGDP1: 1980-1989: DIF GMM		TBGDP1:1990-2000:DIF GMM	
Name of the Variable	Coefficient	t-statistic	Coefficient	t-statistic
TBGDP(-1)	0.7473***	4.90	0.5066***	8.49
GROWTH	-0.0547	-1.41	-0.1679***	-3.65
GROWTH(-1)	-0.0377	-1.28	-0.0905**	-2.62
PPI	0.0103**	2.04	0.00985***	4.87
LIBER	-0.7098	-1.10	0.8669	1.22
ADVGR	0.1278***	3.44	-0.0408	1.65
CONSTANT	0.1078	1.34	-0.2158**	-2.21
First Order AC	-2.22 (0.027)		-2.46 (0.014)	
Second Order AC	1.46 (0.145)		-0.43 (0.668)	
Number of Obs	182		177	
Sargan Test χ^2	10.63 (1.00)		10.35 (1.00)	

.***Significant at 1% level, **Significant at 5% level, *Significant at 10% level

Notes:

1. Year dummies are included .
2. Asymptotic standard errors, asymptotically robust to heteroscedasticity are reported in parentheses.
3. First order AC and second order AC are tests of first-order and second-order serial correlation in the first differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.
4. Sargan is a test of over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with degrees of freedom reported in parentheses.
5. The instruments used in each equation are: GMM (DIF)- $TBGDP_{it-2....}TBGDP_{i1}$, $GROWTH_{it-2}$….$GROWTH_{i1}$, PPI_{it-1}…..PPI_{i1} and $ADVGR_{it-1}$…..$ADVGR_{i1}$