Free Trade Agreements, Trade Openness and Economic Growth: A study of Asia

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Abstract

The accelerated proliferation of the volume of FTAs for Asian economies has constantly intrigued the economics researchers. An anonymous conclusion is yet to be reached about the effect of FTAs on economic growth. This research investigates the affiliation amidst in-effect FTAs and trade openness on growth. A dynamic panel approach with the Arellano-Bond GMM estimators has been used for this research to tackle the endogeneity issue faced by past literatures. This research enhances the current literature by scrutinizing both bilateral and multilateral FTAs in individual models with a dummy variable approach. The inspection of the effect of FTAs on economic development of Asian LDCs in a separate model is also a contribution of this paper to existing literature. Individually, the FTAs failed to indicate statistically significant and positive impact on growth. However, when tested in the presence of trade openness they do exhibit positive statistical significance on growth. Intriguingly, trade openness exhibits a negative ramification on growth in all estimations. The FTA dummy for the Asian LDCs demonstrates a negative outcome on economical progression which can be attributed to the net importer characteristics of those countries.

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Abbreviations

ADB	Asian Development Bank
ADF	Augmented Dickey Fuller Test
ARIC	Asia Regional Integration Center
ATE	Average Treatment Effect
BFTA	Bilateral Free Trade Agreement
CA	Comparative Advantage
CPI	Consumer Price Index
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GMM	Generalized Methods of Moments
HO	Heckscher-Ohlin
IV	Instrument Variable
LDC	Least Developed Country
MFTA	Multilateral Free Trade Agreement
OLS	Ordinary Least Squares
PC	Per Capita
UNCTAD	United Nation Conference on Trade and Development

1. Introduction

"As far as we are concerned there is no protection in Protectionism"

- Jean-Claude Juncker,
President; European Commission
6th July; Brussels, Belgium.

This statement was made after European Union entered into a Free Trade Agreement (FTA) with Japan which is deemed to be the biggest FTA of the modern age.

The definition of a Free Trade Agreement (FTA): a treaty among numerous countries to minimize trade barriers – import quotas and tariffs; and to introduce a zone where limitation free trade in services and merchandises is channeled across mutual borders. It is a tool for economic integration.

During the last three decades the Asian economies have significantly liberalized their international trade through economic integrations. Along with being a part of the World Trade Organization (WTO) the countries are now opting to establish FTA's within themselves. Association of Southeast Asian Nations (ASEAN) and South Asian Association for Regional Corporation (SAARC) were created with a view to facilitate trade for their member countries within Asia. These organizations are growing in member numbers with passing time as countries look to be more integrated in a higher scale to reap the benefits of trade. A membership of such organizations is lucrative as it provides an automatic access to the multilateral FTAs signed by the organization. The number of bilateral FTAs (one-to-one FTA) has also substantially increased as countries try to negotiate their individual needs for favorable terms of trade.

Economic integrations and FTAs are believed to foster economic growth. Among all the benefits of such agreements this is the one that has captured the most attention from the economic researchers. Evidence is present for both positive and negative influence of FTA on growth.[1] Past literature on the topic have failed to conclude a confirm direction of the FTA's effect on countries economic growth. The lack of a concrete conclusion and the rapid increase in the number of FTAs for the Asian countries serve as motivation for the paper. The paper address the issue with a dummy

[1] Detailed discussion can be found at section 2

variable approach which represents the concluded and in-effect FTAs for a country. The first research question that this paper addresses is:

"Does having an in-effect FTA let it be bilateral or multilateral leads to positive economic growth for its member country in comparison with a country with no FTA?"

The paper also investigates the consequence of trade openness on growth. Despite large number of work an anonymous conclusion of the effect of trade openness has not been reached yet. According to Baldwin (2003) puts it, "Because of the ambiguity of the relationship between trade and growth, the empirical relationship remains an open one." Harrison and Rodriguez-Clare (2009) reviewed past studies inspecting the affinity amongst trade-openness and growth. Studies exhibiting a positive connection amid openness and economic progress suffer from numerous number of limitations. Two of the biggest issues of past literature are the definition of trade-openness used by the past authors and the issue of endogeneity between trade-openness and economic growth. Authors in the past have utilized the Gravity equation approach to tackle the endogeneity issue. However, the Gravity model itself suffer from time invariant observations issue. These issues have made the past estimation models subject to criticism and serves as motivation for this paper. Therefore, the second research question becomes:

"Can greater trade integration induce positive level of growth on subject country's economy?"

This research scrutinizes the influence of FTAs on economic growth of Least Developed Countries (LDC) separately. DeJong and Ripoll (2006), tests cross-country data for 1975-2000 and finds economic growth is affected through openness. However, the magnitude is restricted by the income level. A positive link was discovered between growth rates and tariffs for world's poorest countries while the association was negative for rich countries. Due to lack of bargaining power to influence the terms of trade the LDCs can suffer from adverse effect of trade. This paper suspects a negative impact of FTAs for LDCs. The final research question of the paper is:

"Does the FTAs (both bilateral and multilateral) exhibit a negative burden on the economic development of LDCs?"

Past studies have used trade openness and trade volume interchangeably. This study explores the effect of trade openness on growth with an index for trade openness. The endogeneity of the FTA and trade openness is repeatedly stated in past literature. To manage the issue of endogeneity this

research uses a dynamic panel model approach. The Arellano-Bond approach for estimating dynamic panel model uses lags of the dependent and independent variables instrument variables. A separate instrument variable for trade openness is also used along with the lagged instrument variables. Furthermore, the openness indicator is tested in lagged form to tackle the issue of reverse causality. The models are tested in the presence of a set of six control variables.

The dynamic panel model is estimated for 31 Asian countries including seven out of nine LDCs of the region. The time line is 1990-2013 as the FTAs are a relatively new notion for Asian economies. To reveal the actual effect of FTA on growth only the in-effect FTAs are considered in this study leaving out the FTAs those which are under negotiation or have been signed but not called into effect yet. The different models are estimated with a strongly balanced panel dataset.

The effect of FTAs on economic growth is tested in two separate models. One model tests the FTAs independently and the other model tests the FTAs in presence of trade openness. When tested individually, both formation of the FTAs fail to exhibit a positive impact on economic growth of Asian countries. Intriguingly, when tested in the presence of trade openness both dummy variables for bilateral and multilateral FTA exhibit a positive and statistically significant effect on economic growth. These findings is in agreement with Nunn and Trefler (2004), who have shown countries with controlled trade openness experience higher growth.

The trade openness variable is statistically significant throughout the models as expected. However, interestingly enough it demonstrates a negative sign in all the estimations. Although this finding may be infrequent it is not unprecedented. Chang, Kaltani, and Loayza (2009) show that the growth effect of trade openness is significantly positive only if certain complementary domestic reforms are undertaken, including deregulations of business, financial developments, better education, rule of law, labor market flexibility, etc.

The dummy variable of FTAs for LDCs appears with a negative coefficient value. Both bilateral and multilateral FTAs exhibit negative effect on economic growth for LDCs. FTAs eliminates import tariffs which can be crucial in protecting domestic industries from rigorous international competition. Harrison and Rodriguez-Clare (2009) reviewed studies that show industrial policies which offers a degree of protection tend to have a positive effect on economic growth of those countries that lack comparative advantage in trade. This is discussed in depth later in the paper.

The upcoming sections are ordered as follows. Section 2 provides the discussion on past literature on FTA and trade openness regarding economic growth of countries. Section 3 describes the methodology where the estimation model is presented with an explanation for the variables used in the paper. The motivation for the research hypotheses and individual estimation models are presented in Section 4. In section 5, the results of the Arellano-Bond GMM estimators are presented and discussed. Lastly, section 6 concludes the paper with suggestions for future research and policy recommendations.

2. Literature Review

This section sheds light on the association amidst international trade and economic growth beginning with a brief discussion of economic theories of international trade regarding the subject. Following through is a presentation of past literature on FTA and economic growth; trade openness and growth.

2.1 Trade Theories and Growth

What is the true nature of the correlation amongst trade and growth? The findings have been ambiguous. The direction of the topic intrigues researchers even today. The following three models of pertain trade with economic growth.

I. Factor-proportion model

II. Intra-industry trade model

III. Endogenous growth model

Factor-proportion model:

The factor-proportion model or the Heckscher-Ohlin (HO) model predicts the pattern of trade between countries on basis of characteristics of the countries. The model states that the relative abundance of factor endowments determines comparative advantage of the countries which ultimately dictates the trade pattern. To elaborate, according to HO model capital intensive goods will be exported by capital-abundant country and labour-intensive good will be exported by labour-abundant country.

The HO model itself doesn't exhibit the direct relation between trade and growth; the Rybczynski theorem- dynamic version of HO sheds light on the subject. Under the assumption of the abundant factor being capital it assumes that ultra-biased growth along the capital-expansion path will be reached by the country.

Intra-industry trade model:

Substantial empirical studies of international trade have argued that conventional theories of comparative advantage cannot effectively explain the trade among the industrial countries. Two stylized facts of world trade can provide explanation to the contradiction of traditional theories. First- majority of world trade is conducted among countries with analogous factor endowments. Second- the nature of trade between identical countries is fundamentally introductory; implying the trade consists of two-way transaction in parallel goods. The inter-industry specialization and trade is a result of orthodox forces of CA operating on groups of products. Nevertheless, existence of scale economies in production limits the diversity of merchandises produced by a country. Hence identical countries will have an incentive to trade, usually in goods manufactured with analogous factor proportions and this trade does not include distributional effect of income. These economies of scale emerging in intra-industry trade are thought to pave the way for rapid productivity gains and thus accelerated growth (Krugman, 1981).

Endogenous growth model:

Endogenous growth theory states economic growth is mainly the result of endogenous factors and not exogenous forces. It states that investment in human capital, innovation, and knowledge are substantial patrons of economic growth. It further explains the aspect of spillover effects and positive externalities of a knowledge-based economy which leads to economic growth. The implication of the theory is that policies increasing the openness and competitiveness of the economy will foster growth.

Foreign direct investment (FDI) increases knowledge spillovers across countries (Barro and Sala-i-Martin, 1995). Both physical and human capital experiences productivity increase through spillovers. Production efficiency enrichment of endogenous growth factors can be extended with supplementary Research and Development and with learning-by-doing. In this model, investment

or trade first affect the productivity of endogenous growth factors and then the economic progress of a country.

2.2 FTA, Trade and Growth:

Having experienced the rapid rise in the volume of Free Trade Agreements among countries, both bilateral and multi-lateral; in last two decades one can be led to assume that FTAs have positive effect on the country's income. However, there is little empirical support from the international economists to the claim of a positive effect of FTAs on country's income due to lack of reliable quantitative estimation methods.

The vast majority of the past literature on FTAs has been concentrated on examining the effect of FTAs on member countries trade flows rather than investigating a direct link of FTAs with the economic growth of the member countries. "Gravity Equation" has been the most popular approach in the past literature to study the effect of FTAs on bilateral trade flows. Noble laureate Jan Tinbergen (1962) was the first to publish an econometric study using the gravity equation for international trade flows. His work which included evaluation of FTA dummy variables on trade which showed insignificant ATE of FTAs on trade flows.

Past literature of gravity equation typically applied cross-sectional data for a particular year or multiple years pooled together and used a dummy variable representing the absence or presence of an FTA to estimate the ATE of an FTA on member countries' bilateral trade flows (Aitken (1973) and Baldwin (1994)). Following this particular method Aitken (1973) found positive and statistically significant effect of European Commission on its members trade flows. However, coefficient estimation of such dummy variable frequently depicts extreme volatility across years. In numerous cases seemingly successful economic integrations– such as the European Union (formerly, European Economic Community) – have negative estimated treatment effects, Frankel (1997). This vulnerability of estimated FTA treatment effects was addressed by Ghosh and Yamarik (2004). They applied extreme-bounds analysis to test the robustness of FTA dummy coefficient estimates and found empirical evidence using cross-section data that estimated ATE of most FTAs are "fragile"; pointing out the fact that there are still no consistent ex post estimates of ATE of the FTAs.

Baier and Bergstrand (2007), used panel data to control for the endogeneity of FTAs as standard cross-section techniques with instrumental variables. They showed that FTAs actually increased trade of the member countries. One interesting findings of their work is that they found the member countries trade approximately doubles ten years after the FTA has been call into force.

Turning to the literature on direct link between FTA and economic growth; Sohn and Lee (2010) undertook a 'trade-structure' approach to study the effect of FTA on economic growth. Conducting a dynamic panel analysis with Germanized Method of Moments (GMM) approach it was shown that FTAs exhibit strong influence on world economic growth. The fascinating finding of the work was that the estimated coefficients of FTAs for East Asian economies were much weaker when compared to that of the world economy; implying FTAs and trade structure have less effect on the growth of East Asian countries than that of their world counterparts.

Hur and Park (2012) studied the effect of bilateral FTA on growth rates of the member countries with a data set of 50 countries. Using a nonparametric approach which has no specific functional form and hence can be applied upon a large range of data structure the study showed that the FTAs have an insignificant effect on the growth performance of the member countries between zero-to-ten years after launch. However, the authors also found some countries enjoy positive benefit of the bilateral FTAs whereas their FTA partners experience negative effect FTAs on their economic growth.

LIU (2015), found Regional Trade Agreements (RTA) between the World Trade Organization (WTO) members has no significant growth effects. Following the Two Stage Least Squares (TSLS) and Germanized Method of Moments (GMM) approach to correct for endogeneity of the RTAs, he showed the RTAs have significant effects of growth upon the non WTO member countries rather than WTO countries.

The South Asian intra-regional trade have not followed the conventional path. Although the member countries have experienced positive productivity growth Under the South Asian Preferential Trade Agreement (SAPTA) when replaced by South Asian Free Trade Agreement (SAFTA) and overall productivity growth within the region actually decreased (Islam et al. (2016)).

To sum it up, researchers are yet to be find a concrete answer to the question whether FTAs have positive effect on countries economic growth or not, which serves as inspiration for this paper.

2.3 Trade Openness and Growth:

According to Busse and Koeniger (2012), trade is believed to foster the efficiency of resource allocation, allowing a country to realize economies of scale and scope, support technological progress, inspire the transmission of knowledge, and increase competitiveness in both domestic and international markets, leading to an escalation of production line and moreover to the development of new products. While recent empirical literature and research support this view, little more than a decade ago the discussion of the topic seemed undecided as there was evidence for both results: trade openness and trade barriers promoting growth.

The first era of globalization has experienced a tariff-growth paradox. Average tariff rates, which are ought to hinder trade, had significant-positive relationship with total factor productivity growth for 1980-1990 (Rodriguez and Rodrik, 2001). Positive association between import tariffs and economic growth were also reported by Rodrik (2001) with graphical evidence for 1990s. In the same light, Yanikkaya (2003) examines the relationship between growth and trade restrictions and finds contradictory outcomes to the orthodox view on the issue, confirming that trade barriers in form of tariffs can actually be advantageous for developing countries' economic growth under certain conditions.

Rruka (2004) provides additional evidence supporting Yanikkaya's findings that appropriate tariffs indeed appear to provide for higher levels of economic growth through adequate protection from international trade. However, the sector on which the protection is applied is shown to be a crucial factor. Nunn and Trefler (2004) found growth is rapid for countries that protect skill-intensive sectors when compared to countries which protect unskilled-labor-intensive industries.

Lehmann and O'Rourke (2008) found what you protect matters. They found evidence that policies are much likely to have the desired outcome if the pattern of protection is skewed towards sectors yielding increasing returns that provides important externalities compared to protection is given to declining sectors or sectors with-out externalities. This finding is also supported by Grossman and Helpman (1991).

Abbas (2014) examined impact of trade liberalization on economic growth and showed increased trade liberalization deteriorates economic growth of both developing and least developed countries.

On the other side, International bodies argue generally for a positive relationship between trade openness and growth. The OECD (1998, 36) states: "More open and outward-oriented economies consistently outperform countries with restrictive trade and [foreign] investment regimes." According to the International Monetary Fund (IMF; 1997, 84): "Policies toward foreign trade are among the more important factors promoting economic growth and convergence in developing countries." Sachs and Warner (1995), using an openness index rather than trade barriers, give supporting evidence to the claim that outward-oriented economies consistently outperform inward-oriented economies, with the conclusion that openness leads to more economic growth.

The conventional approaches, which were mainly used before the millennial, oversee the fact that the openness indicators are in many cases likely to be endogenous and hence, lead to biased results (Rodriguez and Rodrik, 1999). Rodriguez and Rodrik argue that the explanatory power of trade barriers are often correlated with other growth-inhibiting factors such as governance; or at best represents a proxy for general economic performance. Frankel and Romer (1999) which was published by in the same year as Rodriguez and Rodriks' critique; introduced an instrumental variable approach to the trade-openness-and-growth-topic, using a Gravity model for the IV-regression. Comparing their results of the standard OLS estimates with those of the IV-regression, they argue that there is no evidence that OLS estimates overstate the effects of trade on income growth. Their findings suggest that trade has a quantitatively large and robust positive effect on income and that OLS merely underestimates the effect of the trade share on income.

While testing influence of trade openness on income through trade volume and tariff measures no systematic effect was found on the income share of the poorest countries (Dollar and Kraay, 2004). Interestingly, when they tested the impact of trade openness through decade-to-decade change in trade volume with an instrumental variable approach the results turned in favour of trade. Using lagged trade volume as instrument for current trade volume over cross-sectional data, the findings indicated that changes in growth rates of the economies are highly correlated with the changes in the trade volume.

A Frankel-Romer instrument was imitated by Ferrarini (2010) from a global trade matrix for 1990–2007 period of 157 countries. It was deployed to evaluate the direction of the relationship between trade and income. Results from the panel instrumental variable regression confirms rise of income on average across trading nations triggered by international trade, particularly this effect appears to be strongest for countries of developing Asia. Distinctively, country-size which was thought to be a representation of domestic trade potential was found to be less an appropriate feature in clarifying the increase of income in developing Asia.

Despite evidence of positive effect of trade openness on economic growth, the presence of negative effect of trade openness in past literature is also not negligible. The shortage of guaranteed direction of the impact of trade openness serves as motivation to investigate this issue in this research.

2.4 FTA Scenario of Asia

The notion of Free Trade Agreements were slow for Asian economies during the end period of the twentieth century. A meager number of three FTAs were in force in East Asia, including the ASEAN Free Trade Area (AFTA) in 2000. Fascinatingly, the quantity of FTAs in the region augmented more than tenfold in just a decade. Rapid growth in the FTA initiatives in Asia are attributed to the following four main factors by Kawai and Wignaraja (2011/2014):

(i) Deepening market-driven economic integration in Asia,

(ii) European and North American economic integration,

(iii) The 1997–1998 Asian financial crisis, and

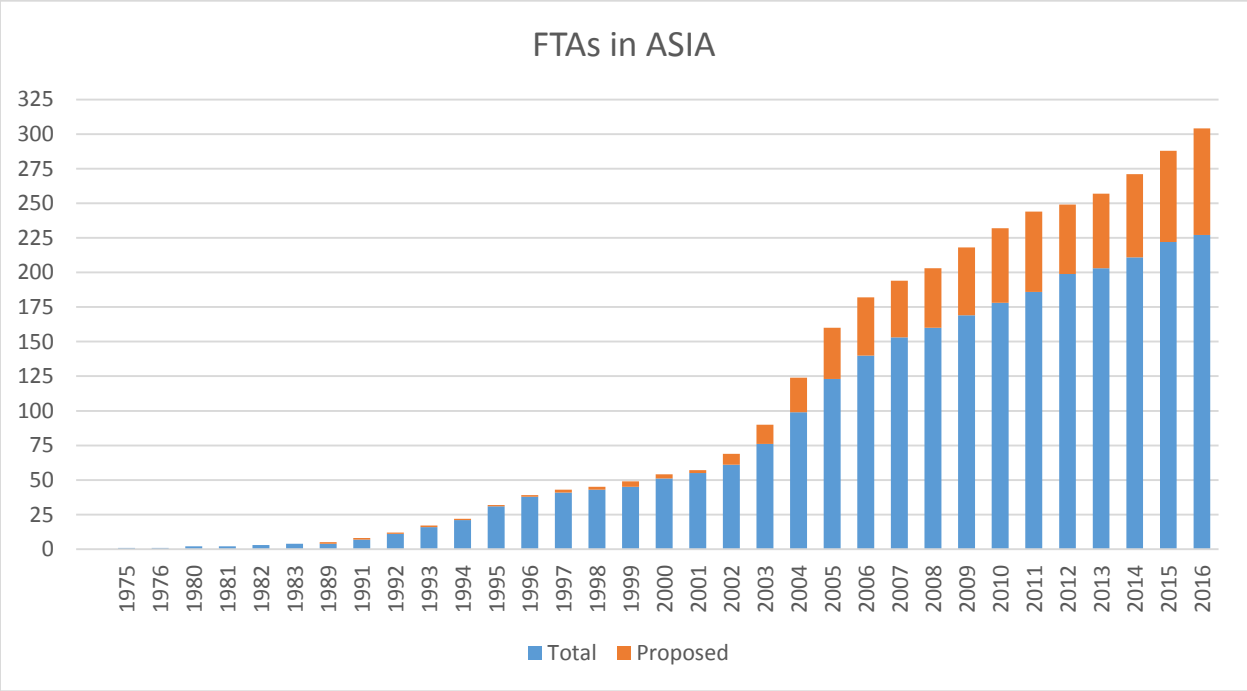
(iv) Slow progress in the WTO Doha negotiations

First, the market-driven economic integration through trade, FDI, and the formation of production networks between East Asian economies. The world economy is increasingly becoming interconnected and to sustain in a competitive world, trade integration between the countries are crucial. The policymakers of Asia believe that FTAs can be used as a tool to eliminate the cross-border obstacles and promote the growth of trade and FDI. Hence, FTAs are regarded a policy framework to expand the production networks formed among the global Multi-National Companies (MNC) and the East Asian firms.

Second, North American and European developed countries forming regional economic agreements i.e. North American Free Trade Agreement (NAFTA) and European Union have inspired East Asian FTAs. The expansion of EU to the Baltic region and the success of NAFTA made the Asian economies realized the necessity to create economic integration to strengthen their negotiation authority, improve international competitiveness and raise their voice on global trade issues.

Third, financial crisis of 1997–1998 in Asia served as a wake-up call for the Asian economies. During the Crisis Thailand suffered the most. The debt-to-GDP ratio shot up beyond 180% in the four major ASEAN countries. The crisis made the Asian countries realize that in order to sustain growth and stability they need to work together in the area of trade and investment by addressing mutual obstacles. Owing to time consuming nature of the targets, they are not yet fulfilled by either regional cooperation or national policies. Nevertheless, following the rise of FTAs in the region especially with the largest economies of the regions- Japan and China, a number of other countries have begun to bandwagon of these initiatives out of fear of rejection.

Figure 2.1: Total and proposed number of FTAs in Asia



source: ADB ARIC database

Fourth, the slow progress of the WTO Doha Development Round negotiations. Beginning in November 2001 the WTO Doha Development Round aimed to promote trade-led growth in least developed countries. The major focused points were liberalization of two key areas: market access for agricultural and non-agricultural goods. Unfortunately thirteen years after the initiation of the Doha Development Round it failed to successfully conclude the negotiations which led the Asian countries seek the FTAs as an alternative approach and resulted in a surge in the number of FTAs.

This phenomenon is fairly evident from the graph above which demonstrates the surge in FTA numbers for the Asian region. The number of FTA in 1975 and in 1989 was only one and four respectively. From that not only the number of signed FTAs has increased significantly to 232 FTAs in 2017; but also higher number of FTAs are being proposed, 90 in 2017 by the Asian countries both in form of bilateral and multilateral partnerships.

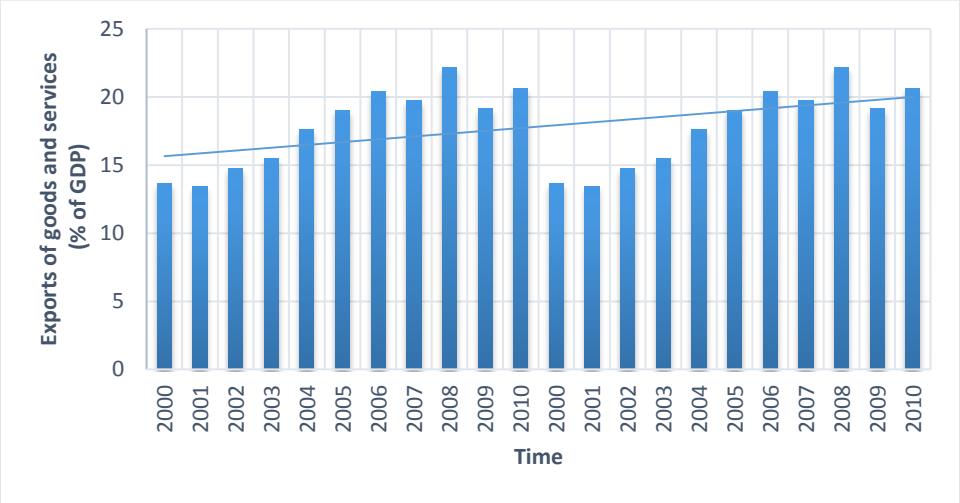
2.5 Asia and Trade Openness

The emergence of Asia in the world economy as factory economy over the fifty year period from the back-dated agricultural economy is considered as an economic miracle (Stiglitz, (1996)). In 1950, East Asia (excluding China and Japan) were lagging behind Latin America which was the most developed region outside the industrial countries, with an average level of real GDP per capita more than 2.5 times than that of East Asian countries. During the period of 1950s and 1960s Asia had little prospect of economic advancement as the countries were burdened with high poverty levels and lacked natural resources to boost the economy. A long period of policies directed towards creating market driven expansion of international trade and FDI assisted Asia to become the 'global factory' that the world sees today. Needless to mention, FTA and openness of the economies both have played vital parts in creating the modern factory Asia.

Since 1980s, Asian countries emerged in the stage of global economy. In 1985, Asia accounted for 19% of total world export. The leading economies such as Japan and China shifted towards manufacturing economies from agricultural economic systems. In 1995, Japan was the third largest country in the world in terms of total export. China overtook Japan in 2004 to become the biggest exporting economy in Asia and the third largest in the world. By 2009 China replaced Germany as the world's leading exporter. Since then China has kept the position of world largest exporter economy strongly under its belt. Not only the East Asian economies but also the countries of South Asia are also letting their presence known in the global stage especially in the Ready-made-

Garments (RMG) sector. Bangladesh - a South Asian least developed country is the second largest exporter of RMG in the world after China. The South Asian economies are exhibiting a greater degree of openness through their export orientated economies. The following diagram demonstrates the percentage share of exports in country's GDP for South Asian countries.

Figure 2.2: Exports of goods and services (% of GDP) for South Asian Countries



Source: World Bank database

Above figure shows a fitted upward trend for the South Asian in terms of Exports of goods and services for the period 2000-2010. The increasing percentage of exports in country's GDP is also apparent in recent trade statistics of the South Asian countries.

3. Methodology

A formal model for the estimation is created in this section. A description of the variables used in the estimation process and the sources of data are also presented in this section.

3.1 Estimation Model

Majority of past literature on FTA used the Average Treat Effect (ATE) with a probit model to determine the effect of FTAs on cross-sectional data. Instrumental variables (IV) were introduced to tackle the issue of endogeneity. However, despite trying a wide range of instrumental variable the results were inconsistent. The IVs used by the past authors which are correlated cross-sectionally with FTA are also correlated cross-sectionally with other variables. This made the problem of endogeneity persist in cross sectional studies such as the gravity model studies on FTA. Later it was concluded, the IV estimations of the cross-sectional data are not a reliable method for the endogeneity issue of FTAs (Baier and Bergstrand, (2007)).

This paper uses dynamic panel model approach for this research. Random and fixed effect methods will lead to biased estimator in this particular case. A traditional random effect approach on panel data will lead to biased estimation of the parameters as it cannot account for the unobservable time-invariant heterogeneity among the countries. In fixed effect model, the underlying assumption is that the regressors are correlated to the time-invariant unobserved component. Correlation between observables and unobservables creates endogeneity problem which produces inconsistent estimations parameters if orthodox linear panel-data estimators are used. Possible solution would be to take the first difference for the relationship of interest. For instance, when one wants to estimate the following relationship:

$$y_{it} = \alpha_i + \gamma y_{i(t-1)} + \beta_j X_{it} + \varepsilon_{it} \qquad (3.1)$$

Where y is the real per capita growth rate of GDP between period t-1 and t. i, t and j represnts countries i Є (1,2, ……, N), time periods t Є (1990,1991,……,2013) and variables j Є (1,2, ……, n) respectively. X is the vector containing main interest variable FTA dummies and trade openness along with other control variables. The β captures the variable's effect on growth. Lastly, ε is the error term. Taking the first differences will result in the following:

$$\Delta y_{it} = \gamma \Delta y_{i(t-1)} + \beta_j \Delta X_{it} + \Delta \varepsilon_{it} \qquad (3.2)$$

Unfortunately, even after the transformation to the first differences this strategy will not work as $y_{i(t-1)}$ in $\Delta y_{i(t-1)}$ is a function ε_{it-1} which is also in $\Delta\varepsilon_{it}$. Therefore, implying $E(\Delta y_{i(t-1)}\Delta\varepsilon_{it})\neq 0$.

This correlation can be corrected using instrumental variables. Now the question becomes which instrumental variable? Arellano and Bond (1991), revealed the construction of estimators on the basis of moment equations constructed from further lagged levels of y_{it} and first-differenced errors. Assumption of Generalized Method of Moments (GMM): particular lagged levels of the dependent variable are orthogonal to the differenced disturbances is used to create GMM-type moment conditions. Following this framework Arellano-Bond suggests the second lags of the dependent variable and all the feasible lags thereafter are reliable IVs for the purpose of estimation. Thus, the above linear dynamic model is estimated using $X_{i(t-2)}$, $X_{i(t-3)}$,…… and $y_{i(t-2)}, y_{i(t-3)}$…. and so on as instruments for the entire period of the data.

In order to the Arellano-Bond IVs to hold the following condition must hold:

$$E(\Delta y_{i(t-T)}\Delta\varepsilon_{it})=0 \qquad \text{for } T\geq 2 \qquad (3.3)$$

Which implies the differenced unobserved time-invariant component should be unrelated to the second lag of the dependent variable and the lags thereafter. This solves the problem of endogeneity. The statement also indicates absence of serial correlation in ε_{it}. This leads to consistent estimator under heterogeneity.

First two models are estimated for bilateral and multilateral dummy variables. In the third model trade openness is introduced. In fourth and fifth model the FTA dummies are tested in the presence of trade openness. The last four model examines the effect of FTAs on LDCs by introducing separate dummy variable for both bilateral and multilateral FTAs for the LDCs. The LDC dummy variables are also investigated together with trade openness for scrutiny. In every model for trade openness an instrumental variable has been used to tackle endogeneity.

3.2 Variables

An overview of the dependent, independent and instrumental variable of the growth regression is presented in this section. Discussion regarding the selection of explanatory variables compared to standard variables is also offered in the section.

Table 3.1: Variable name, description, formula and source

Category	Variable	Description	Formula	Source
Independent variable	$ycap_{it}$	Real per capita GDP growth rate		UNCTAD
Dependent variables	$yinitial_{i,t0}$	Initial level of real PC GDP		UNCTAD
	$DBFTA_{it}$	Dummy variable for bilateral FTA	$DBFTA = \begin{cases} 1 \text{ if } BFTA > 0 \\ 0 \text{ otherwise} \end{cases}$	BFTA data Compiled from ADB database
	$DMFTA_{it}$	Dummy variable for multilateral FTA	$DMFTA = \begin{cases} 1 \text{ if } MFTA > 0 \\ 0 \text{ otherwise} \end{cases}$	MFTA data Compiled from ADB database
	$TO_{i,t-1}$	Trade openness measured in trade volume and used in lagged form	$\frac{export_{it} + import_{it}}{GDP_{t-1}}$	Constructed from UNCTAD
	$Bldc_{it}$	Dummy variable for LDCs in possession of bilateral FTAs	$= \begin{cases} 1 \text{ if } BFTA > 0, LDC > 0 \\ 0 \text{ otherwise} \end{cases}$	
	$Mldc_{it}$	Dummy variable for LDCs in possession of multilateral FTAs	$= \begin{cases} 1 \text{ if } MFTA > 0, LDC > 0 \\ 0 \text{ otherwise} \end{cases}$	
Control variables	inf_{it}	Annual percentage change of CPI used in natural log form		UNCTAD
	fdi_{it}	Inflow of direct foreign investment		UNCTAD
	pop_{it}	Annual population growth rate of country i		World Bank
	$govcon_{it}$	Government consumption expenditure as a percentage of annual GDP		World Bank
	sav_{it}	Gross domestic savings as percentage of GDP		World Bank
	$lifeexp_{it}$	National life expectancy of country i		World Bank
Instrumental Variable	IV_{it}	Constructed by taking the difference of trade openness of country i at time t from its average	$iv_{it} = (TO_{it} - \overline{TO}_i)$	Constructed from *TO* variable

Detailed explanation of every variable and their construction methods are presented in the following section.

3.2.1 Dependent Variables

$ycap_{it}$ is the dependent variable representing the annual average per capital GDP growth rate of country i at time t at constant national currency. Contemporaneous literatures have used it as an indicator to describe the pace of economic development of an economy.

3.2.2 Independent Variables

$yinitial_{i,t0}$ is initial level of real per capital GDP in the OLS benchmark regressions. Dollar and Kraay (2004) used such per capital GDP levels to account for the initial state as suggested by the neoclassical growth theory. This variable takes into account the per capita GDP of the year one of the data timeline for each country i. The variable is expected to exhibit negative sign in keeping with the growth theories.

$ycap_{i,t-1}$ is a lagged value of the dependent variable *ycap.* The crucial assumption of Arellano-Bond estimate of the dynamic panel model is that the current dependent variable is influenced by its past form. Previous economic literatures have shown that past growth levels of per capita GDP growth can influence current growth level. This convergence is tasted with the inclusion of initial GDP per capita. The lagged dependent variable serves as a proxy for the initial GDP variable.

$DBFTA_{it}$ is the dummy variable which takes the value of 1 for country i for any positive number of in effect bilateral FTA at t year and 0 otherwise. Talking inspiration from the past literature to capture the effect of FTA on economic development the dummy variable *DBFTA* is created. The dummy variable is created based on the variable *BFTA* which symbolizing the number of concluded and in effect bilateral FTAs for country i at time t.

$DMFTA_{it}$ is the dummy variable which takes the value of 1 for country i for any positive number of in effect multilateral FTA at t year and 0 otherwise. To capture the effect of FTA on economic development the dummy variable *DMFTA* is created. The dummy variable is created based on the variable *MFTA* which symbolizing the number of concluded and in effect Multilateral FTAs for country i at time t.

TO_{it} is the variable describing the trade openness of a country. A trade volume index approach is used to measure the trade openness. This index, as provided by the World Bank and used in a multitude of studies, is defined as the simple ratio of exports and imports to the GDP level of a country. Many acknowledged studies have used and proved the validity of this approach through significance; Frankel and Romer (1999), Dollar and Kraay (2004) among others. A modified form of the ratio, which includes the one-year lag of the GDP level is used in this research. The approach, first mentioned by Koeniger and Busse (2012), appears to be reasonable as it tackles the issue that the trade to GDP ratio in its standard form can conceal important information, in that an increase in exports and imports, e.g., leads to a concurrent increase of the GDP of a country. Koeniger and Busse state "This trade measure avoids a potential bias due to simultaneous changes of both the nominator, volume of exports and imports, and the denominator, total GDP." Lastly, the trade openness variable itself is used in lagged form, $TO_{i,t-1}$;following Dollar and Kraay (2004) and Gries and Redlin (2012). This solves one endogeneity problem of potential reverse causality between the explanatory variable $TO_{i,t-1}$ and the dependent variable $ycap_{it}$.

inf_{it} is the annual percentage change in the cost of acquiring a basket of services and goods for average consumer that may be fixed or changed at specified intervals on yearly basis, as measured by CPI. The inflation rate serves as proxy for financial stability or monetary policy of a country. The data is converted into percentage points and the natural logarithm form of the variable is used for the study.

fdi_{it} stands for the inflow of foreign direct investment for country i at t year. The inflow is measured as flow of direct foreign investment rather than stock. The fdi is taken as an annual percentage of GDP.

pop_{it} stands for annual growth of total population for country i. The idea is to use it as a proxy for the labour force growth of a country. Dollar and Kraay (2004) include this as growth rate. Yanikkaya (2003) uses population densities in his growth regression. This paper uses the annual population growth rate.

$govcon_{it}$ stands for all government final consumption expenditures for purchases of goods and services (including compensation of employees) and is evaluated as ratio to real GDP. Barro (1991); Folster and Henrekson (2001) used government consumption expenditure in their work as a measure of growth. As a macro variable researchers have used both lagged and non-lagged

version government consumption. This research uses a non-lagged version of the variable. The government consumption to GDP ratio proxies for institutional stability of a country.

sav_{it} represents the gross domestic savings rate for a country. It is measured as the total domestic savings less final consumption expenditure (total consumption) as a percentage of GDP. Osang and Pereira (1997) used savings to examine growth rate with respect to trade volumes. Savings serve as a proxy for economic stability of a country.

$lifeexp_{it}$ represents the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Yanikkaya (2003) includes 5 year lagged value of life expectancy to capture its effect on growth. In this paper non lagged value of life expectancy has been used.

$Bldc_{it}$ is the dummy variable for least developed countries in possession of in effect bilateral FTAs. This dummy variables characterizes the effect of bilateral FTAs for a LDC member on its growth. It takes a value of 1 for a LDC country having any number of positive in effect bilateral FTAs at year t and 0 otherwise. The dummy variable is created based on the interaction between *BDFTA* and *LDC* variable.

$Mldc_{it}$ is the dummy variable for least developed countries in possession of in effect multilateral FTAs. This dummy variables characterizes the effect of multilateral FTAs for a LDC member on its growth. It takes a value of 1 for a LDC country having any number of positive in effect multilateral FTAs at year t and 0 otherwise. The dummy variable is created based on the interaction between *DMFTA* and *LDC* variable.

3.2.3 Instrumental Variables

Apart from the lags of the dependent and the independent variables the following variable is also used as an instrumental variable for the dynamic panel model.

IV_{it} is the instrumental variable used for the trade openness variable where account is given to the potential endogeneity of the open variable. For the construction of the instrumental variable the average of trade openness for each country over the entire period from 1990 to 2013 was built. Then a new series for the instrumental variable is calculated for each country i by differencing the observation of the trade volume variable and its average, such that:

$$iv_{it} = (x_{it} - \bar{x}_i) \quad (3.4)$$

The construction of instrumental variable are inspired by Dollar and Kraay (2004) and supported and described in Verbeek (2012).

This instrumental variable approach is superior than that of studies reviewed by Harrison and Rodríguez (2009). They use geographical distance as an instrument variable with a gravity model. This is a weak approach as geographical distance does not change over time and its assumption also does not hold under real world settings. This approach assumes countries trade more through shared borders. In reality Asian countries exhibits higher inter region trade than intra region. For instance, Bangladesh exports approx. more than 87% of its total exports to USA an EU compared to Asian countries.

3.2.4 Selection of Variables

According to past literature initial level of real GDP per capita, investment share of GDP, measure of human capital such as school enrolment rate and population growth explain approx. half of the cross section variance of growth rates. This also serves as inspiration for the variables selected in this research.

The $yinitial_{i,t0}$ variable has been used in the OLS regressions to test the convergence of the steady state as predicted by the neoclassical growth theory and to maintain competency with the past literature.

The data for domestic invest share of GDP of the subject counties is inadequate. The author includes FDI share of GDP and domestic savings share of GDP to account for this phenomena.

For the measure of human capital primary school enrolment rate were included in the regression models. Unfortunately, when tested the variable exhibited contradictory sign and significance to that of economic theory and past literature. The preference of the variable resulted in an enormous drop in the Wald chi^2 statistics. The results remained unchanged even after testing the variable from two different data bases, the World Bank and UNESCO respectively. Therefore, it was decided to drop the variable from the data set as the author aims to secure non-biased estimations.

Population growth rate is included in this study as claimed by the past literature.

The first significance portion of residuals is explained by economic indicators such as political stability and market distortions etc., according to past studies. The author tried to include rule of law and government efficiency to account for such indicators. Unfortunately, the availability of data has been an obstacle in this case. Both of the data set suffer from nine missing values for each of the subject countries in the time period of the study including starting seven years of the time period. An interpolation could have been done. However, as starting seven values were missing rather than values in the middle of the time line; the fitted values would result in biased and low precision estimations. Therefore, the author decided not to include this variables.

The second portion of the residual is explained by international factors which is the central focus of this research. The study includes trade openness and dummy variables for FTAs to examine the impact of trade variables on growth rate.

3.3 Data

3.3.1 Data Timeline

The study is focused on the Asia region. The Asian countries have shown tremendous economic development in recent years. The study takes into account 31 Asian countries after dropping some outliers with large gap in their data. The time line of the data is 24 years staring from 1990 to 2013. The past studies on trade openness have larger timeline; however, as the paper focuses on impact of FTA and they only came into the trade scenario of Asia during 1990s, a later starting point for the data set is selected. Before 1990 the number of in effect FTAs in Asia were almost nonexistent. Nominal number of the subject countries of this study had positive number of in effect FTA in 1990. The notion of FTA gradually appeared for the Asian countries in 1990s and picked up the pace in the 2000s. The end period is 2013 as the data for many subject countries for the year 2014 has not been published yet. Therefore, 1990-2013 is considered the proper timeline for the research which lets the paper take into account recent data for the variables. After dropping outlier the final dataset provides a strongly balanced dynamic panel dataset.

Majority of the countries have experienced positive growth in per capita GDP during the study time period. The decadal average of 1990s and 2000s (Appendix) show greater increase in per capita GDP growth in the 2000s compared to that of 1990s. Many of the countries actually doubled

their growth rate of GDP/capita. The graph of trade openness index (Appendix) also exhibits increased openness of the economies during the data time line, with different dimensions.

3.3.2 Data Sources

The dataset used in this paper is compiled from several sources. The FTA data is collected from the ADB ARIC database which provides information on country-wise FTAs. The data for GDP per capita growth rate, real PC GDP level, trade volume, annual GDP, FDI, inflation is obtained from United Nations Conference of Trade and Development (UNCTAD) statistics data base. The savings, annual population growth rate, life expectancy and government consumption expenditure data has been secured from World Development Indicator of the World Bank database.

4. Hypotheses

4.1 FTAs and Asia

The Asian countries have also realized the importance of regional integration. The Asian countries have two regional associations; South Asian Association for Regional Corporation (SAARC) and Association of Southeast Asian Nations (ASEAN). SAARC founded in 1985 has eight member countries - Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. In 2006, SAARC launched the South Asian Free Trade Area (SAFTA) for its member countries. Following the launch of the FTA the intra-SAARC exports increased substantially to $354.6 billion in 2012 from $206.7 billion in 2009.

ASEAN, founded in 1967 is greater of the two regional organizations. It started with five then extended to ten member countries – Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. ASEAN realizing the importance of regional integration expanded to include China, Japan and South Korea, three major economies of Asia is now known as ASEAN plus three. ASEAN launch the ASEAN Free Trade Agreement (AFTA) in 1992. Apart from the AFTA, ASEAN has FTAs with China, Korea, Japan, Australia, New Zealand, and India. The expected bilateral trade between ASEAN and China alone for 2015 was $500 billion.

The following table presents the number of concluded and in effect FTAs both bilateral and multilateral as of 2015 for the subject countries of this particular study.

Table 4.1: In effect FTAs as of 2015

Country	Bilateral FTAs	Multi-lateral FTAs	Total FTAs
Armenia	8	2	10
Azerbaijan	4	1	5
Bangladesh	0	3	3
Bhutan	1	1	2
Brunei Darussalam	1	7	8
Cambodia	0	6	6
China	14	2	16
Fiji	0	3	3
Georgia	8	3	11
Hong Kong	3	1	4
India	9	4	13
Indonesia	2	7	9
Iran	2	0	2
Japan	13	1	14
Korea [republic of]	11	4	15
Kyrgyz	7	2	9
Lao PDR	1	7	8
Malaysia	7	7	14
Maldives	0	1	1
Myanmar	0	6	6
Nepal	1	1	2
Pakistan	7	3	10
Philippines	1	6	7
Saudi Arabia	0	2	2
Singapore	11	9	20
Sri Lanka	3	2	5
Tajikistan	6	1	7
Thailand	7	6	13
UAE	0	2	2
Vietnam	3	6	9
Yemen	0	1	1

Source: compiled from ADB ARIC database

Among the countries Singapore is in the lead with 20 FTAs, followed by China with 16 and South Korea with 15 FTAs. The leading Asian economies are making haste in securing greater number of FTAs with their trading partners. Currently China, India, South Korea and Singapore have 7,15,8 and 8 FTAs under negotiations respectively. Asia trumps Americas' in FTAs per country. On average Asia has 3.8 concluded FTAs per country compared with 2.9 for the America's. Rapid rise in the number of FTAs among the Asian countries point in the direction that the FTAs are believed to be instrumental in the growth of the economy.

The target of this research is to investigate the effect of FTAs on economic growth. The effect of the FTAs that are in negotiation phase or have been signed but have not been called into force are difficult to demonstrate. Therefore, to capture the distinguish effect the study only considers the FTAs which have been signed and put into effect by the member countries. The leading economies of Asia such as China, India, Japan, South Korea and Singapore have significantly greater number of bilateral FTAs compared to those of their multilateral FTAs. It is assumed by the policy makers that since the number of interested parties in bilateral FTAs is generally restricted to two, it provides the member countries a greater negotiations power in the trade deal. There is less conflict of interest when compared to dealing with a trade bloc or cluster of countries and it is assumed to be more effective in terms of economic growth due to the favorable trade conditions of the member countries. Hence the first hypothesis tested in the paper is:

Hypothesis 1: Bilateral FTAs have a positive and significant effect on the economic growth of its member countries

The first regression model of the paper is:

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta DBFTA_{it} + \beta_2 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (4.1)$$

Past literature mostly considered the effect of bilateral FTAs. Despite being lower in number to the bilateral FTAs there are significant number of in effect multilateral FTAs for the Asian countries. Regardless of being the more complicated version of the FTAs to negotiate the multilateral FTAs are able to provide access to vast trade areas. With an aim to scrutinize the effect of FTAs on economic growth, this research examines the bilateral and multilateral FTAs separately. This adds a new dimension to the existing literature.

The second hypothesis is:

Hypothesis 2: Multilateral FTAs have a positive and significant effect on the economic growth of its member countries

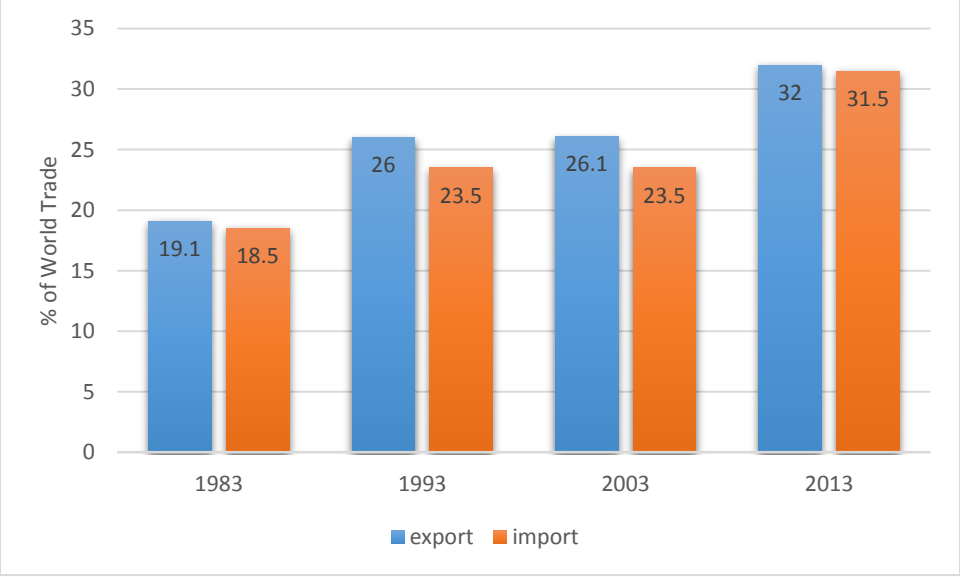
The second regression model of the paper-

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta DMFTA_{it} + \beta_2 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (4.2)$$

4.2 Openness of Asia

The Asian economies are becoming more trade orientated and thus more open. In 2013, 5% of world imports and 10% of world's commercial services exports are attributed to ASEAN. In 2014, ASEAN shipped 7% of total world merchandise exports. Asia as a region is the second biggest exporter and importer in world merchandise trade after Europe. China and Japan hold the first and the fourth position for global export of merchandise in 2014. The following figure demonstrates the share of Asia as a region in the world merchandise trade.

Figure 4.1: Asia's share of world merchandise trade



Source: International Trade Statistics 2015

It is apparent from the chart that Asia's share in the world trade is increasing. This upward movement started in the latter part of the last century. Asia has been blessed with vast workforce and the Asian economies have been intelligent to utilize their massive workforce to turn their economies into manufacture economies. This openness nature of the Asian economies is greatly attributed to the FTAs, both bilateral and Multilateral. The FTAs generally ensure nominal to zero tariff on imports for a member country in the market of its FTA-partner country. This has been instrumental in increasing the competitiveness of the emerging Asian economies and fueling the export boom of the region. However, there is another side of this phenomenon. The developing and LDCs of Asia are net importers. The bulk portion of raw materials and intermediate goods of their export industries are imported. FTAs work as a balancing force to facilitate the Asian countries. This leads the author to suspect that without the presence of FTAs, individually trade openness would actually deter economic growth of a country. Therefore, the third hypothesis for the paper is:

Hypothesis 3: Trade openness in absence of FTAs has a negative and significant effect on the economic growth a country

The regression model for testing trade openness is the following:

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta TO_{i,t-1} + \beta_2 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (4.3)$$

4.3 FTA and openness

FTA and trade openness are anticipated to have an effect on economic growth independently. Nonetheless, there is a relatively new notion of the "third country". It is suspected that having an FTA may induce one of the member countries to trade in greater proportion than earlier with a third country who does not belong to the FTA group. One economic intuition to this scenario is forming an FTA leads to grater trade volume between the member countries. The increased amount of trade demands higher raw materials and intermediate goods for the finished products. This could lead to the member countries trading in increased volume with a third country despite being a non-FTA country which in turn makes the member countries economy more open. Chen and Joshi (2010) showed that the third country effects play an important role in countries' decision to establish new FTAs. The FTAs aims to ensure that there is no exploitation in the trade dimension

by creating a win-win situation for the interested parties and creating an indirect positive externality. Trade openness with non-FTA partners in a controlled measure, coupled with FTAs is expected to result in positive economic growth. Thus the hypotheses becomes:

Hypothesis 4: Bilateral FTAs in the presence of trade openness has a positive and significant effect on a country's economic growth

Regression model to test the hypothesis regarding bilateral FTA and trade openness is-

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta DBFTA_{it} + \beta_2 \Delta TO_{i,t-1} + \beta_3 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (4.4)$$

To scrutinize the effects of bilateral and multilateral FTAs separately the next hypothesis is-

Hypothesis 5: Multilateral FTAs in the presence of trade openness has a positive and significant effect on a country's economic growth

Regression model to test the hypothesis regarding multilateral FTA and trade openness is-

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta DMFTA_{it} + \beta_2 \Delta TO_{i,t-1} + \beta_3 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (4.5)$$

4.4 Growth of Least Developed Countries

There are nine LDCs in Asia. Afghanistan, Bangladesh, Bhutan, Cambodia, East Timor, Laos, Myanmar, Nepal and Yemen. Unfortunately, East Timor doesn't have any sort of FTA and Afghanistan lack adequate data to run statistical tests. The paper considers the rest of the seven countries as subject for this research. The LDC countries of Asia are heavily export oriented. In 2010, the ratio of total export of goods and services to GDP for Bangladesh, Bhutan, Cambodia, Laos, Myanmar, Nepal and Yemen was 19.4, 37.1, 52.1, 31.1, 15.5, 9.3 and 39.7 respectively.

According to growth theories the Least Developed Countries (LDC) experience higher degree of growth compared to the developed economies for the same degree of growth measures for being at the initial phase of the growth path. This statement is also holds for negative effects. Researchers suspect opening up the economies of the LDCs by eliminating all protective trade barriers can reduce the net national income. Clemens and Williamson (2001), found a positive correlation between import tariffs and economic growth across countries during the late nineteenth century.

Among the Asian LDCs Bangladesh, Cambodia, Myanmar and Yemen doesn't have any bilateral FTAs. The LDCs lack the socio-economic position to influence terms of trade in their favor in the FTA negotiations. A bilateral FTA with LDCs are sometimes considered a liability by the developed counterparts. Oskooee, Mohtadi, and Shabsigh (1991) found negative relation between export growth and economic growth of Indonesia. Abbas (2014) found negative effect of trade liberalization index on economic growth of LDCs. This paper suspects a negative relation with the FTAs and the growth of the LDCs. The paper tests the effect of FTA on LDCs by introducing a dummy variable. The hypothesis is:

Hypothesis 6: There is significant negative difference on the effect of Bilateral FTAs on growth of the least developed countries

The regression equation:

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta Bldc_{it} + \beta_2 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (4.6)$$

Then the effect of bilateral FTAs on LDCs are tested in the presence of trade openness. The LDCs have implemented protective measures for their domestic industries. However, the author suspects even with established protection policies the LDCs experience a negative effect on growth due to the FTAs.

Hypothesis 7: There is significant negative difference on the effect of Bilateral FTAs even in the presence of trade openness on growth of the least developed countries

The regression equation:

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta Bldc_{it} + \beta_2 \Delta TO_{i,t-1} + \beta_3 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (4.7)$$

The paper examines the effects of bilateral and multilateral FTAs independently. The last two hypotheses of the author's work is to scrutinize the effects of multilateral FTAs on economic growth of LDCs. A negative relation is also suspected in case of the multilateral FTAs due to similar underlying assumptions. The hypothesis is:

Hypothesis 8: There is significant negative difference on the effect of Multilateral FTAs on growth of the least developed countries

The regression model:

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta Mldc_{it} + \beta_2 \Delta X_{it} + \Delta \varepsilon_{it} \quad (4.8)$$

Lastly, author suspects even with trade openness the LDCs experience a negative effect on growth due to the multilateral FTAs. The final hypothesis of the paper is:

Hypothesis 9: There is significant negative difference on the effect of Multilateral FTAs even in the presence of trade openness on growth of the least developed countries

The last regression model in this paper to be tested is-

$$\Delta ycap_{it} = \gamma \Delta ycap_{i(t-1)} + \beta_1 \Delta Mldc_{it} + \beta_2 \Delta TO_{i,t-1} + \beta_3 \Delta X_{it} + \Delta \varepsilon_{it} \quad (4.9)$$

5. Empirical Outputs

The outputs of the estimated regressions along with their interpretation are presented are presented in this section.

5.1 Unit root tests

The analysis begins with testing the core variables for unit roots. Presence of unit root in a variable may lead to spurious regression results. The dependent variable $ycap_{it}$ and the independent variable *TO* are tested for unit roots. The FTAs enter the regression models as dummy variables which doesn't contain unit roots by construction. The Augmented Dickey-Fuller (ADF) test has been used for unit roots.

The dependent variable $ycap_{it}$ doesn't contain unit roots when tested by ADF including time trend and one lagged difference. The inverse chi-square and modified inverse chi-square both are highly statistically significant with p-values of 0.0000 which allows us to reject the null hypothesis of "all panel contains unit root".

Table 5.1: Unit root test of $ycap_{it}$

		Statistic	p-value
Inverse chi-squared(62)	P	219.2998	0.00
Inverse normal	Z	-8.8556	0.00
Inverse logit t(159)	L*	-10.1958	0.00
Modified inv. chi-squared	Pm	14.1259	0.00

Next, the TO_{it} variable is tested for unit roots with the ADF test. The TO_{it} variable does contain unit roots. However, for this research the lagged version of *TO* have been used. When $TO_{i,t-1}$ is tested for unit roots with the ADF approach it does not exhibit any unit roots. This secures the research from coming across spurious regression results. The inverse chi-square and modified inverse chi-square both are highly statistically significant with p-values of 0.0000 which allows us to reject the null hypothesis of "all panel contains unit root".

Table 5.2: Unit root test of $TO_{i,t-1}$

		Statistic	p-value
Inverse chi-squared(62)	P	505.1444	0.00
Inverse normal	Z	-8.0423	0.00
Inverse logit t(159)	L*	-21.4350	0.00
Modified inv. chi-squared	Pm	39.7955	0.00

5.2 Hypotheses Estimations

The dynamic panel models are estimated by the Arellano-Bond approach which corrects for the unobservable endogeneity and heteroskedasticity by using lags of dependent and independent variable created with GMM type moments as instrumental variables. In the regression models with trade openness an additional instrumental variable *IV* has been used along with the differentiated instrumental variables used in the Arellano-Bond approach.

5.2.1 Hypothesis 1

The first hypothesis tests the effect of bilateral FTAs on a country's economic growth. First a simple OLS model has been run with the dependent variable, the dummy variable of bilateral FTAs and the initial level per capita GDP. A second OLS regression has been run including all the control variables. These two models are used as benchmarks to compare the results with the Arellano-Bond models.

In the first OLS model $DBFTA_{it}$ is positive in value. It changes sign to negative in presence of the control variables. It is statistically insignificant in both of the equations. The $yinitial_{i,t0}$ variable is high statistical significance with negative sign in both equations confirming the assumption of neoclassical growth theory. The control variables inflation, population growth, domestic savings

and government consumption expenditure are highly statistically significant with negative, negative, positive and negative sign respectively. FDI is weakly statistically significant with positive sign. Life expectancy is negative and insignificant.

Table 5.3: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000122****	-0.000127****
	(0.000)	(0.001)
$DBFTA_{it}$	0.270	-0.277
	(0.558)	(0.543)
$Linf_{it}$		-3.778****
		(0.000)
fdi_{it}		0.0513*
		(0.118)
pop_{it}		-0.871****
		(0.000)
$govcon_{it}$		-0.276****
		(0.000)
sav_{it}		0.0464****
		(0.004)
$lifeexp_{it}$		-0.0387
		(0.511)
constant	4.165****	6.506**
	(0.000)	(0.093)
N	727	661
R-sq	0.3328	0.5714

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The first Arellano-Bond regression tests the dummy variable $DBFTA_{it}$ on $ycap_{it}$ with one lagged value of *ycap* as an independent variable. This provides a positive but statistically insignificant result of the dummy variable $DBFTA_{it}$. Now, the control variables are added into the regression model one by one. The first control variable introduced in the model is inflation in its natural logarithm form. Then FDI, population growth, government consumption expenditure, domestic savings and life expectancy are included in the model sequentially. The dummy variable $DBFTA_{it}$ remains positive but statistically insignificant with the inclusion of inflation in the model. However, it changes sign to negative with the inclusion of FDI in the regression. The variable still remains statistically insignificant. $DBFTA_{it}$ retains the negative sign throughout the equations. A matter of interest is when domestic savings is introduced in the equation the dummy variable $DBFTA_{it}$ becomes statistically significant at 10% significance level with a coefficient value of -

1.185. This finding is contradictory to the hypothesis. With the inclusion of the last control variable life expectancy, the dummy variable $DBFTA_{it}$ again becomes statistically insignificant while retaining the negative sign.

Table 5.4: Arellano-Bond estimations of the first hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.455****	0.411****	0.412****	0.406****	0.412****	0.394****	0.393****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$DBFTA_{it}$	0.315	0.0163	-0.0786	-0.409	-0.577	-1.185**	-0.504
	(0.631)	(0.981)	(0.907)	(0.545)	(0.349)	(0.069)	(0.530)
$Linf_{it}$		-1.222****	-1.127****	-1.216****	-1.300****	-1.210****	-1.373****
		(0.004)	(0.008)	(0.004)	(0.001)	(0.002)	(0.001)
fdi_{it}			0.0793**	0.0881***	0.0690**	0.0765**	0.0787***
			(0.063)	(0.039)	(0.080)	(0.054)	(0.048)
pop_{it}				-0.683****	-0.868****	-0.814****	-0.815****
				(0.001)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.424****	-0.409****	-0.387****
					(0.000)	(0.000)	(0.000)
sav_{it}						0.0665****	0.0756****
						(0.008)	(0.003)
$lifeexp_{it}$							-0.164*
							(0.150)
constant	1.915****	0.830*	0.648	1.769****	7.363****	5.888****	16.37***
	(0.000)	(0.117)	(0.229)	(0.005)	(0.000)	(0.000)	(0.028)
N	663	649	649	649	610	601	601
Wald chi^2	191.33	205.50	209.18	220.72	326.54	335.61	338.75

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

The lagged value of per capita GDP growth rate is positive and highly statistically significant in all estimations. Proving the assumption that the present growth rate of PC GDP growth is highly influence by past growth rates.

Inflation is highly statistically significant throughout the models with a negative sign. This is intuitive as higher level of inflation lower the growth rate of per capita GDP. FDI is positive and statistically significant in all models. This is supported by economics theories as more inflow of FDI leads to greater economic activities which enhances the growth rate of per capita GDP. Population growth rate is highly statistically significant throughout the models with a negative sign. Asia has few of the most densely populated countries such as Bangladesh, China and India which accounts for one third of the world population. Higher population growth leads to exhaustion of resources and high level of poverty which slows down economic growth. Government consumption expenditure is negatively statistically significant. Past research has found higher government expenditure leads to lower growth of economy (Barro (1991)). Domestic savings is positive and highly statistically significant. Higher rate of savings implies higher level of per capita income. Lastly, life expectancy is weakly statistically significant with a negative sign. Higher life expectancy implies a greater number of senior population who depend on government in terms of pension. This leads to supplementary pressure on limited resources and lower economic growth, a situation currently faced by Japan.

The results of these regression equation leads to the conclusion that bilateral FTA does not exhibit positive and significant influence on country's economic growth. The first hypothesis is rejected.

5.2.2 Hypothesis 2

The second hypothesis tests the effect of multilateral FTAs on a country's economic growth. First two simple OLS model has been run. First OLS models tests the dependent variable $ycap_{it}$, the dummy variable of multilateral FTAs and $yinitial_{i,t0}$. Second OLS regression has been tested including all the control variables. These two models are used as benchmarks to compare the results with the Arellano-Bond models.

Table 5.5: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000124****	-0.000129****
	(0.000)	(0.001)
$DMFTA_{it}$	0.191	-0.862**
	(0.695)	(0.059)
$Linf_{it}$		-3.835****
		(0.000)
fdi_{it}		0.0491*
		(0.134)
pop_{it}		-0.834****
		(0.000)
$govcon_{it}$		-0.286****
		(0.000)
sav_{it}		0.0502****
		(0.002)
$lifeexp_{it}$		-0.0357
		(0.508)
constant	4.173****	6.633**
	(0.000)	(0.065)
N	727	661
R-sq	0.3434	0.5747

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The dummy variable for multilateral FTAs, $DMFTA_{it}$ is positive in the first OLS model. Fascinatingly, it turns negative and gains statistical significance in the second OLS equation. The initial level per capita GDP is highly statistically significant at 1% significance level in both OLS models. Every control variables are statistically significant in different level of significance with expected signs excluding $lifeexp_{it.}$

Now, the dynamic panel models are estimated. The first Arellano-Bond regression tests the dummy variable $DMFTA_{it}$ on $ycap_{it}$ with one lag of $ycap_{i,t-1}$ as an independent variable. The lagged version of real per capita GDP growth rate which represents a proxy for initial GDP in this research, is highly statistically significant at 1% significance level with p-value of 0.000 in all the estimations. This is in line with economic theories, implicating that past values of growth rate can influence the growth rate of the present.

Table 5.6: Arellano-Bond estimations of the second hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.455****	0.408****	0.409****	0.405****	0.407****	0.389****	0.390****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$DMFTA_{it}$	0.134	-0.451	-0.508	-0.372	-0.935	-1.145*	-0.530
	(0.842)	(0.524)	(0.472)	(0.599)	(0.189)	(0.108)	(0.509)
$Linf_{it}$		-1.283****	-1.190****	-1.250****	-1.392****	-1.326****	-1.440****
		(0.003)	(0.006)	(0.004)	(0.001)	(0.001)	(0.000)
fdi_{it}			0.0795**	0.0867***	0.0645*	0.0684**	0.0754**
			(0.062)	(0.042)	(0.101)	(0.084)	(0.058)
pop_{it}				-0.664****	-0.854****	-0.786****	-0.806****
				(0.001)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.429****	-0.426****	-0.391****
					(0.000)	(0.000)	(0.000)
sav_{it}						0.0585***	0.0727****
						(0.017)	(0.005)
$lifeexp_{it}$							-0.173**
							(0.097)
constant	1.964****	1.075**	0.886*	1.773****	7.681****	6.355****	17.11***
	(0.000)	(0.073)	(0.146)	(0.008)	(0.000)	(0.000)	(0.010)
N	663	649	649	649	610	601	601
Wald chi^2	191.63	206.75	210.42	221.17	328.39	334.53	338.71

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

The first dynamic panel model without the control variables provides a positive but statistically insignificant result of the dummy variable $DMFTA_{it}$. Now, the control variables are added into the regression model one by one. The first control variable introduced in the model is inflation in its

natural logarithm form. Then FDI, population growth, government consumption expenditure, domestic savings and life expectancy are incorporated in the regressions sequentially. With inclusion of first control variavble inf_{it} the dummy variable $DMFTA_{it}$ changes its sign to negative but remains statistically insignificant with the inclusion of inflation in the model. $DMFTA_{it}$ retains the negative sign throughout the equations. A matter of interest is when domestic savings is introduced in the equation the dummy variable $DMFTA_{it}$ becomes statistically significant at 15% significance level with a coefficient value of -1.145. This shows multilateral FTAs actually have a negative effect on economic growths of its member countries. This finding is contradictory to the hypothesis. With the inclusion of the last control variable life expectancy, the dummy variable $DMFTA_{it}$ again becomes statistically insignificant while retaining the negative sign.

The control variable inflation is highly statistically significant throughout each models with a negative sign. FDI is positively statistically significant in all models. Population growth rate is highly statistically significant throughout the models with a negative sign. Government consumption expenditure is negatively statistically significant. Domestic savings is positive and highly statistically significant. Higher rate of savings implies higher level of per capita income. Lastly, life expectancy is weakly statistically significant with a negative sign. All of them exhibit expected signs and follow similar patterns to that of the bilateral FTA model tested earlier.

The results of these regression equations lead to the conclusion that multilateral FTAs do not demonstrates a significant positive effect on country's growth. The second hypothesis is rejected.

5.2.3 Hypothesis 3

The third hypothesis examines trade openness on economic growth. Contrary to popular notion this paper suspects a negative linkage among economic growth and trade openness in the absence of FTAs. The instrumental variable IV_{it} has been used in the dynamic panel models.

Research begins with two benchmark OLS regressions without and with control variables respectively. The trade openness variable in its lagged form is statistically significant and negative in both of the models. $Linf_{it}$ is statistically significant and positive. All the other control variables are statistically significant with expected signs.

Table 5.7: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000135****	-0.000139****
	(0.000)	(0.000)
$TO_{i,t-1}$	-0.00671****	-0.00941****
	(0.009)	(0.000)
$Linf_{it}$		0.388
		(0.401)
fdi_{it}		0.0723***
		(0.017)
pop_{it}		-0.775****
		(0.000)
$govcon_{it}$		-0.121***
		(0.016)
sav_{it}		0.0845****
		(0.000)
$lifeexp_{it}$		-0.0146
		(0.783)
constant	5.431****	7.576***
	(0.000)	(0.029)
N	683	622
R-sq	0.3295	0.5759

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The instrument variable IV_{it} is used in Arellano-Bond approach for these estimations. The lagged $ycap_{i,t-1}$ is highly positively statistically significant in all equations confiming the assumption of past growth rates predicting the present growth rates of per capita GDP.

$TO_{i,t-1}$ is highly tatistically significant at 1% significane level and negative both in the individual model and in every model of the control variables. The coefficient values of $TO_{i,t-1}$ increases with inclusion of each control variable. The results proof that trade openness can actually be deterimental for economic expansion of countries in absence of FTAs. The negative effect of trade openness is corroborated by Grossman and Helpman (1991), Yanikkaya (2003). Both of the literature shows countries with protection policies which leads to lower level of trade openness experience higher growth compared to that of their counterparts. The Asian region consists of mainly developing and LDCs. In order to achieve sustainable growth these countries require

controlled trade opennes. Repaid trade openness often can run the doemstic firms out of business through the crowding out effect.

Table 5.8: Arellano-Bond estimations of the third hypothesis

	Dependent variable Ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.272****	0.279****	0.283****	0.267****	0.328****	0.279****	0.289****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$TO_{i,t-1}$	-0.0229****	-0.0257****	-0.0259****	-0.0276****	-0.0300****	-0.0367****	-0.0413****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Linf_{it}$		0.240	0.243	0.269	-0.0875	-0.366	-0.312
		(0.660)	(0.657)	(0.620)	(0.865)	(0.463)	(0.533)
fdi_{it}			0.0494	0.0569*	0.0321	0.0481	0.0422
			(0.204)	(0.141)	(0.375)	(0.175)	(0.237)
pop_{it}				-0.802****	-1.016****	-0.901****	-0.893****
				(0.000)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.230***	-0.102	-0.127
					(0.019)	(0.296)	(0.199)
sav_{it}						0.165****	0.148****
						(0.000)	(0.000)
$lifeexp_{it}$							0.159*
							(0.146)
constant	5.024****	5.541****	5.342****	6.853****	9.670****	4.290****	-5.623
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.417)
N	620	608	608	608	572	564	564
Wald chi^2	82.21	87.03	88.41	108.63	173.62	220.19	226.02

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

Among the control variables inflation changes sign from postive to negative when $govcon_{it}$ is introduced. It remains statistically insignificant throughout. fdi_{it} is statistically insignificant except

when population growth is introduced. It exhibits positive impact on growth rate. pop_{it} is negative and highly statistically significant. $govcon_{it}$ statistically significant when introdeuced, however loses its significance when savings is introduced. Domestic savings is statistically significant and postivie. Lastly, $lifeexp_{it}$ is statistically significant and positive.

The estimation results of the equations lead to the conclusion that trade openness does have a significant and negative consequence on country's economic expansion in absence of FTAs.

5.2.4 Hypothesis 4

The fourth hypothesis tests the effect of bilateral FTAs on economic growth in the presence of trade openness. This hypothesis assumes that controlled trade openness coupled with FTAs provides countries to control the market share of the domestic firms in the domestic market and encourage export oriented firms to increase productivity; thus increasing growth.

Table 5.9: Benchmark OLS regressions without and with control variables

	Dependent variable Ycap	
	Without control variables	With control Variables
$yinitial_{i,t0}$	-0.000130****	-0.000131****
	(0.000)	(0.000)
$DBFTA_{it}$	0.535	0.295
	(0.178)	(0.483)
$TO_{i,t-1}$	-0.00745****	-0.00956****
	(0.005)	(0.000)
$Linf_{it}$		0.391
		(0.398)
fdi_{it}		0.0727***
		(0.016)
pop_{it}		-0.765****
		(0.000)
$govcon_{it}$		-0.122***
		(0.015)
sav_{it}		0.0856****
		(0.000)
$lifeexp_{it}$		-0.0319
		(0.585)
constant	5.245****	8.592***
	(0.000)	(0.022)
N	683	622
R-sq	0.3479	0.5813

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The two benchmark OLS regression shows the dummy variable for bilateral FTAs exhibit positive sign and is statistically insignificant in the presence of trade openness in without and with control

variables. Trade openness still remains negative and highly statistically significant. Among the control variables inflation and life expectancy is positive and negative respectively and both show statistical insignificance. Other control variables are statistically significant with expected signs.

Table 5.10: Arellano-Bond estimations of the fourth hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.272****	0.278****	0.282****	0.267****	0.327****	0.281****	0.287****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$DBFTA_{it}$	2.519****	2.360****	2.313****	1.982****	1.733****	0.814	0.504
	(0.000)	(0.001)	(0.001)	(0.004)	(0.006)	(0.203)	(0.487)
$TO_{i,t-1}$	-0.0327****	-0.0342****	-0.0342****	-0.0346****	-0.0367****	-0.0393****	-0.0417****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Linf_{it}$		0.260	0.262	0.285	-0.108	-0.363	-0.327
		(0.632)	(0.629)	(0.598)	(0.833)	(0.467)	(0.514)
fdi_{it}			0.0418	0.0498	0.0239	0.0436	0.0411
			(0.280)	(0.196)	(0.508)	(0.222)	(0.250)
pop_{it}				-0.741****	-0.974****	-0.889****	-0.887****
				(0.000)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.239***	-0.112	-0.127
					(0.014)	(0.250)	(0.201)
sav_{it}						0.158****	0.149****
						(0.000)	(0.000)
$lifeexp_{it}$							0.117
							(0.347)
constant	4.882****	5.357****	5.194****	6.615****	9.593****	4.470****	-2.895
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.714)
N	620	608	608	608	572	564	564
Wald chi^2	97.16	99.77	100.62	117.77	182.73	222.11	226.18

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

In the Arellano-Bond model the instrumental variable IV_{it} has been utilized. Lagged $yacp_{i,t-1}$ is positive and highly statistically significant in all equations. The dummy variable $DBFTA_{it}$ is highly

statistically significant at 1% significance level and positive in the presence of trade openness. It retains its statistical significance at 1% significance level with introduction of control variables inflation, FDI, pop_{it} and $govcon_{it}$. With introduction of sav_{it} into the equation it loses its statistical significance, however remains positive in sign. One possible interpretation of this is with increasing domestic savings there is less consumption demand in the market for both imported and domestic products. Due to lower number of market transaction the bilateral FTAs though still positive in value, fails to significantly affect the economic growth. In the final equation with inclusion of $lifeexp_{it}$ it remains positive and statistically insignificant.

The control variables inflation, FDI and life expectancy are statistically insignificant. Population growth is highly statistically significant in all equations. $govcon_{it}$ is statistically significant only when it is first introduced. sav_{it} is highly statistically significant and positive in this model.

Based on the above results it is concluded bilateral FTA can have positive impact on economic growth in presence of trade openness if certain pre-conditions are fulfilled. Therefore, hypothesis four cannot be rejected.

5.2.5 Hypothesis 5

The fifth hypothesis tests the effect of multilateral FTAs on economic growth in the presence of trade openness. The paper expects to find a positive relation between multilateral FTAs and economic growth. The instrumental variable IV_{it} has been used in the Arellano-Bond models.

The benchmark OLS euqations show $DMFTA_{it}$ is negative and statistically insignificant in presence of trade openness. Trade openness is highly statistically significant and negative in both equations. Initial level per capital GDP exhibits negative sign as predicted. The control variables behave in similar fashion to that of benchmark equations of the fourth hypothesis with inflation rate and life expectancy remaining statistically insignificant.

Table 5.11: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000135****	-0.000143****
	(0.000)	(0.000)
$DMFTA_{it}$	-0.269	-0.497
	(0.534)	(0.242)
$TO_{i,t-1}$	-0.00640***	-0.00923****
	(0.015)	(0.001)
$Linf_{it}$		0.349
		(0.452)
fdi_{it}		0.0701***
		(0.021)
pop_{it}		-0.766****
		(0.000)
$govcon_{it}$		-0.126***
		(0.014)
sav_{it}		0.0869****
		(0.000)
$lifeexp_{it}$		-0.00512
		(0.924)
constant	5.576****	7.193***
	(0.000)	(0.040)
N	683	622
R-sq	0.3392	0.5893

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The Arellano-Bond models provide intriguing results. The first lagged variable of per capita GDP is also highly statistical significance and positive in all models. Trade openness is highly statistical significance and negative in all equations. Its coefficient value increases with each additional control variable.

Table 5.12: Arellano-Bond estimations of the fifth hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.292****	0.296****	0.300****	0.285****	0.342****	0.292****	0.298****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$DMFTA_{it}$	2.237****	1.893***	1.864***	2.157****	1.528***	1.262**	1.077*
	(0.002)	(0.010)	(0.011)	(0.003)	(0.036)	(0.074)	(0.137)
$TO_{i,t-1}$	-0.0314****	-0.0323****	-0.0324****	-0.0353****	-0.0347****	-0.0404****	-0.0434****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Linf_{it}$		0.258	0.261	0.292	-0.0351	-0.314	-0.287
		(0.636)	(0.632)	(0.590)	(0.946)	(0.530)	(0.567)
fdi_{it}			0.0474	0.0550	0.0352	0.0505	0.0459
			(0.222)	(0.154)	(0.331)	(0.155)	(0.200)
pop_{it}				-0.855****	-1.013****	-0.904****	-0.897****
				(0.000)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.222***	-0.0979	-0.117
					(0.023)	(0.315)	(0.237)
sav_{it}						0.160****	0.149****
						(0.000)	(0.000)
$lifeexp_{it}$							0.122
							(0.278)
constant	4.283****	4.860****	4.681****	6.192****	8.999****	3.881***	-3.710
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.016)	(0.600)
N	620	608	608	608	572	564	564
Wald chi^2	92.21	93.88	95.05	117.70	177.50	222.41	227.10

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

$DMFTA_{it}$ shows high positive statistical significance at 1% significance level in the dynamic panel model without the control variables. It remains statistically significant and positive in all of the equations even with inclusion of savings, unlike bilateral FTAs. The significance level slightly drops with the introduction of control variables inflation and FDI. With the introduction of pop_{it}, $DMFTA_{it}$ becomes statistically significant at 1% significance level. The coefficient value also increases in this equation. The significance level drops again with inclusion of $govcon_{it}$. The significance level again 10% with introduction of savings. In the last equation $DMFTA_{it}$ still exhibits positive statistical significance. One interesting observation, $DMFTA_{it}$ gradually decreases in its coefficient value until population growth is introduced. There is a jump in equation 4 and then it gradually decreases again. This validates the findings of Lehmann and O'Rourke (2008); Nunn and Trefler (2004). Both of the studies found countries with controlled trade openness towards higher returns and export oriented domestic sectors experienced higher growth. One possible explanation of why $DMFTA_{it}$ retains its statistical significance with higher domestic savings but $DBFTA_{it}$ loses its; is multilateral FTAs are generally conducted between a country and a trade bloc. MFTAs covers greater trade areas than that of BFTAs. Higher domestic savings may be sufficient to offset the BFTA effects, it is not enough in magnitude to offset the total trade effect of MFTAs.

Based on the above estimations it is concluded MFTAs displays positive and significant effect on economic advancement in presence of trade openness. Hypothesis five is proven true.

5.2.6 Hypothesis 6

The sixth hypothesis examines the negative effect of BFTA on economic progress of LDCs with dummy variable $Bldc_{it}$ which takes a value of 1 when a LDC has a bilateral FTA and 0 otherwise.

The benchmark OLS regression shows positive and statistically insignificant effect of BFTAs on economic progression of LDCs in both models. All of the control variables are significant with expected signs except life expectancy which is insignificant.

Table 5.13: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000124****	-0.000120****
	(0.000)	(0.001)
$Bldc_{it}$	0.203	0.146
	(0.856)	(0.881)
$Linf_{it}$		-3.784****
		(0.000)
fdi_{it}		0.0508*
		(0.122)
pop_{it}		-0.861****
		(0.000)
$govcon_{it}$		-0.278****
		(0.000)
sav_{it}		0.0475****
		(0.003)
$lifeexp_{it}$		-0.0552
		(0.303)
constant	4.276****	7.453***
	(0.000)	(0.039)
N	727	661
R-sq	0.3348	0.5709

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

Lagged $ycap_{i,t-1}$ is highly statistically significant and positive in every Arellano-Bond equations. The dummy variable $Bldc_{it}$ is negative in the first equation without control variables. It is statistically insignificant in presence of inflation, fdi_{it} and pop_{it}. However, it becomes statistically significant at 15% significance level with the inclusion of government consumption expenditure. It becomes highly statistically significant at 5% significance level with inclusion of sav_{it}. The significance level again increases *to* 15% with introduction of life expectancy. $Bldc_{it}$ exhibits a negative effect in all three of the statistically significant equations.

All the control variables remains statistically significant since their inclusion of the in the equations with expected signs. Apart from FDI and $lifeexp_{it}$ which are statistically significant at 5% and 10% significance level respectively; all the other control variables are statistically significant at 1% significance level.

Table 5.14: Arellano-Bond estimations of the sixth hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.454****	0.410****	0.411****	0.405****	0.410****	0.390****	0.389****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Bldc_{it}$	-0.872	-1.929	-2.162	-2.369	-3.456*	-5.353***	-3.992*
	(0.725)	(0.447)	(0.394)	(0.350)	(0.143)	(0.028)	(0.113)
$Linf_{it}$		-1.241****	-1.142****	-1.218****	-1.303****	-1.198****	-1.372****
		(0.003)	(0.007)	(0.004)	(0.001)	(0.002)	(0.001)
fdi_{it}			0.0798**	0.0873***	0.0671**	0.0730**	0.0781***
			(0.061)	(0.040)	(0.088)	(0.065)	(0.049)
pop_{it}				-0.665****	-0.857****	-0.788****	-0.807****
				(0.001)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.432****	-0.426****	-0.389****
					(0.000)	(0.000)	(0.000)
sav_{it}						0.0709****	0.0838****
						(0.005)	(0.001)
$lifeexp_{it}$							-0.167**
							(0.081)
constant	2.109****	0.943***	0.736*	1.711****	7.386****	5.727****	16.39****
	(0.000)	(0.049)	(0.135)	(0.003)	(0.000)	(0.000)	(0.010)
N	663	649	649	649	610	601	601
Wald chi^2	191.55	206.57	210.27	221.22	327.61	337.70	342.39

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

All Wald chi^2 statistics are statistically significant with 0.000 p-values

Judging from the Arellano-Bond estimations $Bldc_{it}$ exhibits negative sign all throughout the models and remains significant in the last three equation, the sixth hypothesis cannot be rejected.

5.2.7 Hypothesis 7

This hypothesis examines the negative effect of BFTA on economic growth of LDCs with the dummy variable $Bldc_{it}$ in the presence of trade openness. The instrumental variable IV_{it} has been used in the dynamic panel models.

Table 5.15: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000134****	-0.000137****
	(0.000)	(0.000)
$Bldc_{it}$	0.0356	0.256
	(0.971)	(0.775)
$TO_{i,t-1}$	-0.00678****	-0.00945****
	(0.009)	(0.000)
$Linf_{it}$		0.387
		(0.403)
fdi		0.0722***
		(0.017)
pop_{it}		-0.777****
		(0.000)
$govcon_{it}$		-0.121***
		(0.017)
sav_{it}		0.0853****
		(0.000)
$lifeexp_{it}$		-0.0175
		(0.745)
constant	5.435****	7.740***
	(0.000)	(0.028)
N	683	622
R-sq	0.3282	0.5727

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The benchmark OLS regression shows positive and statistically insignificant effect of BFTAs on economic growth of LDCs in both models in presence of trade openness. $TO_{i,t-1}$ is highly

statistically significant and negative both with and without control variables. $yinitial_{i,t0}$ is highly statistically significant in both models.

Table 5.16: Arellano-Bond estimations of the seven hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.272****	0.279****	0.283****	0.267****	0.328****	0.278****	0.290****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Bldc_{it}$	2.507	1.653	1.626	1.355	-0.459	-2.800	-3.600**
	(0.269)	(0.477)	(0.485)	(0.558)	(0.829)	(0.179)	(0.091)
$TO_{i,t-1}$	-0.0245****	-0.0266****	-0.0268****	-0.0283****	-0.0297****	-0.0356****	-0.0413****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Linf_{it}$		0.241	0.244	0.271	-0.0865	-0.385	-0.324
		(0.658)	(0.655)	(0.618)	(0.867)	(0.441)	(0.517)
fdi_{it}			0.0482	0.0557*	0.0311	0.0489	0.0418
			(0.215)	(0.150)	(0.391)	(0.168)	(0.241)
pop_{it}				-0.796****	-1.010****	-0.901****	-0.893****
				(0.000)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.230***	-0.104	-0.137
					(0.019)	(0.284)	(0.166)
sav_{it}						0.172****	0.153****
						(0.000)	(0.000)
$lifeexp_{it}$							0.205**
							(0.070)
constant	5.014****	5.518****	5.324****	6.829****	9.661****	4.163****	-8.661
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.227)
N	620	608	608	608	572	564	564
Wald chi^2	83.40	87.44	88.76	108.64	172.62	222.13	229.27

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

Lagged $ycap_{i,t-1}$ is highly statistically significant in each dynamic panel equations. $Bldc_{it}$ is positive and statistically insignificant in the regression model without control variables. It shows gradual decrease in its positive value with each additional control variable while remaining statistically insignificant. The dummy variable changes its sign to negative from positive with the inclusion of $govcon_{it}$ which is statistically significant in the equation. $Bldc_{it}$ remains negative in the rest of the equation. In the final equation with all the control variable $Bldc_{it}$ becomes statistically significant at 10% significance level. Trade openness is negative and highly statistically significant in all the dynamic panel models.

$Bldc_{it}$ shows both positive and negative effect on economic growth in the presence of trade openness. However, as it is statistically significant in the last equation of the dynamic panel model the paper cannot completely reject hypothesis seven.

5.2.8 Hypothesis 8

The eight hypothesis examines the negative effect of MFTA on economic growth of LDCs with the dummy variable $Mldc_{it}$ which takes a value of 1 when a LDC has a multilateral FTA and 0 otherwise. This model tests the effect of multilateral FTAs on LDC's economic growth individually without the presence of trade openness.

The benchmark OLS regressions show $Mldc_{it}$ is positive and statistically insignificant in both of the model. The coefficient value of $Mldc_{it}$ drops noticeably in the presence of the control variables. The initial level per capita GDP is highly statistically significant in both of the OLS models. In the second equation in the control variables are statistically significant with proper signs in line with economic theories except life expectancy. Life expectancy is statistically insignificant and negative in coefficient value.

Table 5.17: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000118****	-0.000121****
	(0.000)	(0.001)
$Mldc_{it}$	0.841	0.249
	(0.278)	(0.715)
$Linf_{it}$		-3.751****
		(0.000)
fdi_{it}		0.0515*
		(0.112)
pop_{it}		-0.866****
		(0.000)
$govcon_{it}$		-0.260****
		(0.000)
sav_{it}		0.0482****
		(0.002)
$lifeexp_{it}$		-0.0527
		(0.310)
constant	4.113****	7.044***
	(0.000)	(0.047)
N	727	661
R-sq	0.3370	0.5845

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The dyanmic panel model exhibits positive and highly statistically significant values for the lagged per capita GDP growth. $Mldc_{it}$ is negative and statistically insignificant in individual Arellano-Bond model. The dummy variable remains statistically insignificant with inclusion of inflation, fdi_{it}, pop_{it} respectivly. With the introduction of *govcon* it becomes statistically significant at 15% significance level. The significance level increases to 5% in the inclusion of domestic savings. It drops to 10% significance level when *lifeexp* is introduced in the last dynamic panel model. $Mldc_{it}$ exhibits negative sign in all the dynamic panel models. A similarity can be observed here with that of hypothesis six is that in both cases the dummy variables become statistically significant when government consumption expenditur is introducted in the dynamic panel model. $govcon_{it}$ is highly statistically significant and negative in equation 5,6 and 7. Past literature has found higher government expenditure leads to lower economic growth. Afonso and Furceri (2008) showed 1 percentage point rise in the government spending to GDP ratio decreses growth in the OECD by 0.12% and in the European Union by 0.13%. As LDCs suffer from the basic economic phenomena-scarcity of resources, higher government expenditure shifts the distribution of resources from export orinted industries. The negative effect also signifies that the LDCs import more under the MFTAs compared to their export counterpart.

Table 5.18: Arellano-Bond estimations of the eight hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.452****	0.408****	0.409****	0.404****	0.410****	0.390****	0.389****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Mldc_{it}$	-1.646	-1.994	-2.105	-2.320	-2.338*	-3.503***	-2.825**
	(0.320)	(0.248)	(0.222)	(0.178)	(0.139)	(0.031)	(0.086)
$Linf_{it}$		-1.254****	-1.156****	-1.235****	-1.312****	-1.220****	-1.397****
		(0.003)	(0.006)	(0.004)	(0.001)	(0.002)	(0.001)
fdi_{it}			0.0797**	0.0872***	0.0668**	0.0722**	0.0778***
			(0.061)	(0.041)	(0.090)	(0.068)	(0.050)
pop_{it}				-0.673****	-0.862****	-0.796****	-0.817****
				(0.001)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.429****	-0.424****	-0.387****
					(0.000)	(0.000)	(0.000)
sav_{it}						0.0657****	0.0807****
						(0.008)	(0.002)
$lifeexp_{it}$							-0.175**
							(0.063)
constant	2.345****	1.160***	0.957**	1.969****	7.542****	6.061****	17.16****
	(0.000)	(0.031)	(0.081)	(0.002)	(0.000)	(0.000)	(0.006)
N	663	649	649	649	610	601	601
Wald chi^2	192.61	207.50	211.18	222.44	327.58	335.82	341.22

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

Based on the above estimations it is possible to observe that LDCs do experience a negative effect on economic growth through multilateral FTAs. Therefore, hypothesis eight cannot be rejected.

5.2.9 Hypothesis 9

The final hypothesis of the research inspects the negative effect of MFTA on economic growth of LDCs with dummy variable $Mldc_{it}$ in the presence of trade openness. The instrumental variable IV_{it} has been used in the dynamic panel models.

Table 5.17: Benchmark OLS regressions without and with control variables

	Dependent variable ycap	
	Without control variables	With control variables
$yinitial_{i,t0}$	-0.000131****	-0.000135****
	(0.000)	(0.000)
$Mldc_{it}$	0.438	0.659
	(0.540)	(0.310)
$TO_{i,t-1}$	-0.00680****	-0.00938****
	(0.008)	(0.000)
$Linf_{it}$		0.409
		(0.377)
fdi_{it}		0.0727***
		(0.016)
pop_{it}		-0.776****
		(0.000)
$govcon_{it}$		-0.113***
		(0.027)
sav_{it}		0.0854****
		(0.000)
$lifeexp_{it}$		-0.0137
		(0.795)
constant	5.344****	7.285***
	(0.000)	(0.036)
N	683	622
R-sq	0.3202	0.5772

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level

The benchmark OLS regression shows positive and statistically insignificant effect of MFTAs on growth of LDCs in both models in presence of trade openness. $TO_{i,t-1}$ is highly statistically significant and negative both with and without control variables. The coefficient value of trade openness is small.

Table 5.19: Arellano-Bond estimations of the nineth hypothesis

	Dependent variable ycap						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ycap_{i,t-1}$	0.272****	0.279****	0.283****	0.266****	0.327****	0.275****	0.286****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Mldc_{it}$	0.495	0.120	0.0709	-0.224	-0.599	-2.425**	-2.752**
	(0.752)	(0.940)	(0.964)	(0.887)	(0.678)	(0.089)	(0.055)
$TO_{i,t-1}$	-0.0233****	-0.0258****	-0.0260****	-0.0275****	-0.0297****	-0.0357****	-0.0413****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Linf_{it}$		0.241	0.244	0.272	-0.0886	-0.388	-0.328
		(0.659)	(0.655)	(0.617)	(0.864)	(0.437)	(0.512)
fdi_{it}			0.0492	0.0567*	0.0322	0.0501	0.0432
			(0.206)	(0.143)	(0.373)	(0.158)	(0.226)
pop_{it}				-0.800****	-1.020****	-0.916****	-0.908****
				(0.000)	(0.000)	(0.000)	(0.000)
$govcon_{it}$					-0.231***	-0.102	-0.132
					(0.018)	(0.296)	(0.182)
sav_{it}						0.172****	0.154****
						(0.000)	(0.000)
$lifeexp_{it}$							0.195**
							(0.078)
constant	4.972****	5.531****	5.340****	6.888****	9.761****	4.393****	-7.789
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.266)
N	620	608	608	608	572	564	564
Wald chi^2	82.22	86.93	88.30	108.42	173.50	222.65	229.57

*15% significance level; **10% significance level; ***5% significance level; ****1% significance level
All Wald chi^2 statistics are statistically significant with 0.000 p-values

The Arellano-Bond dynamic panel model shows positive and highly statistically significant values for the lagged per capita GDP growth rate in every equations. Lagged trade openness is negative and highly statistically significant in each eastimated regression models. The dummy variable $Mldc_{it}$ begins with positive and statistically insignificant coefficient in the presence of trade opennes. With the inclusion of pop_{it} as an control variable $Mld_{it}c$ changes its sign to negative. The variable pop_{it} itself is negative and highly statistically significant in all the equation in which it is included. With the introduction of sav_{it} the dummy variable becomes statistically significant at 10% significance level. $Mldc_{it}$ remains negative and statistically significant at 10% significance level in the last equation of the dynamic panel model where $lifeexp_{it}$ has been introduced which is also statistically significant at 10% significance.

Based on estimations of Arellano-bond models it is visible that $Mldc_{it}$ does exhibit negative effect on economic growth of LDCs in presence of tradeopenness. Therefore, the final hypothesis cannot be completely rejected.

6. Policy Recommendation and Future Research Prospects

Asian economies have intrigued researchers for their unorthodox economic growth. During the 1980s it wasn't expected that Asia would become a power house for the world trade in a relatively short span of twenty years. Asian countries are among the fastest growing economies. Even with the pressure of the highest population of the world and high poverty rate, China is now the leading exporter of international trade. 2 out of top 5 of the global exporters are Asian countries. The estimated results of the OLS models confirms the assumption of the neoclassical growth theory and the findings of past growth literature. The Asian economies are following the steady state path of convergence as predicted by economic growth theories.

International trade has certainly played its part in the growth of Asian economies. The results of the fourth and fifth dynamic panel models confirms the theories of FTAs leading to higher growth levels. Economic integration can be positively influential when conducted through proper channels. FTAs include trade facilitation measurements which ensures free movement of goods between the member countries. Lower trade frictions and lower costs generates higher level of economic activity and adds to nation's income. However, the FTAs solely are not sufficient to increase the growth of the Asian economies as shown by the first two hypotheses estimations.

They need to be combined with proper trade openness measurements to enjoy the positive impact on growth. A recommendation to the policy makers would be to carefully calculate the gains from exports against the costs of imports not only from the direct FTA partners but also from the externality generated by the FTAs and only opt for FTAs if the gains outweighs the costs.

Trade openness is negatively effects economic growth as it has been proven by the third hypothesis and also in the other estimations. Although it may seem unorthodox to experience a negative impact of trade openness it is not unprecedented as it has been discussed in the literature review. First explanation of this outcome can be attributed to the measure of trade openness used in this study. Past literature have used only export growth, import tariff decline and trade volume separately whereas this study has used an index for trade openness. The index uses trade volume as a ratio of lagged value of GDP. This approach liberates the index from reverse causality and contemporaneous effect suffered by the measurements used in past studies. Another explanation for this phenomena is the Financial Crisis of late 2000s. The world economy suffered prominently in the Financial Crisis beginning in 2007. This resulted in extensive decrease of the purchasing power of the western economies which are the major consumers of Asian exports. The crisis also resulted in dramatic increase of food prices in the world. The majority of the Asian economy especially the LDCs are net importers of food. While the income from Asian export sector declined; food grains being an inelastic product, the volume of import did not decrease in proportion. This resulted in lower net income level for the Asian economies. The western world and the Asian exports are still recovering from aftermath of the crisis.

The LDC countries reveals the other side of the trade liberalization. Blindly signing FTAs as a bandwagon effect will lead to lower growth. The developing economies in Asia achieved their developing status with none or little assistant from FTAs. The recent rapid growth FTAs are exhibited by the economies which have already overcame the LDC phase and now possess substantial resources to tackle the issues that come with opening their economies to foreign competitors. They are now in possession of the technical knowledge and economic means to utilize their comparative advantage of trade to maintain a positive balance in their trade account. It would seem timing of the FTA is crucial. FTA being a two directional tool, the gains from it should be carefully calculated with the costs of conducting an FTA rather than making an untimely decision just for the sake of it. The proverb “learn to walk before you can run” can be a motto for the Asian

LDCs in this context. It is recommended that the LDCs should commence a FTA only if it facilitates its export oriented industries in which the LDC has a comparative advantage.

The paper followed a dynamic panel approach to tackle the issue of endogeneity by using the difference of the variables as instrumental variables along with the separate IV for trade openness. Selecting a proper instrumental variable has always been a challenge for researchers. Future research can attempt to investigate the trade openness and FTA aspect of growth with different instrumental variable approach. Taking a different data sample with a longer time period can also be tested for significant results of the FTAs as FTAs tend to effect growth in the long run (Hur and Park, (2012)). This can be an exciting prospect for future researchers.

7. Appendix

Figure A.1: Distribution of trade openness for the Asian countries

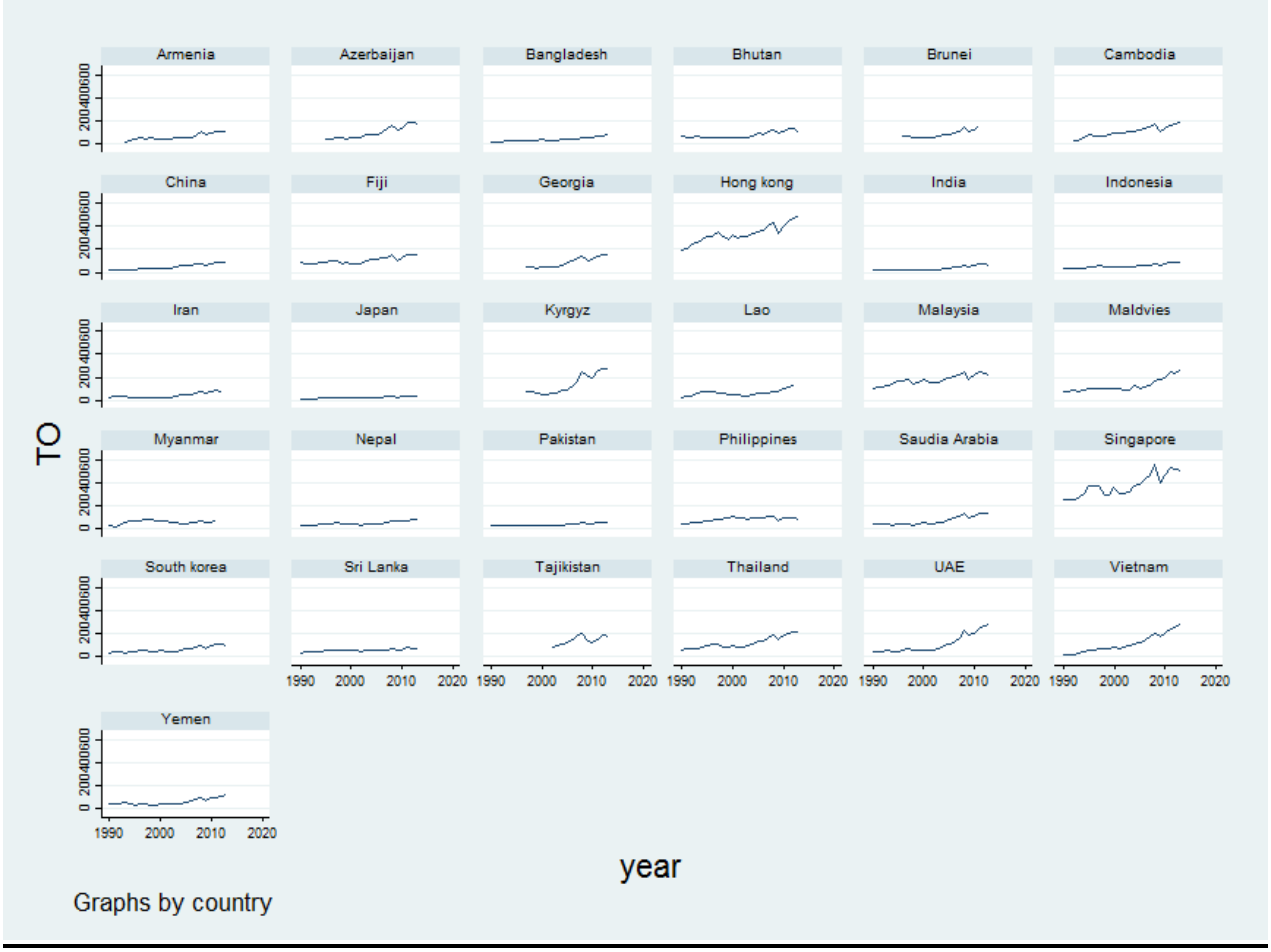


Figure A.2: Distribution of BFTAs for the subject countries

Figure A.3: Distribution of MFTAs for the subject countries

Table A.1: Statistical summary of original variables

Variable	Observations	Mean	Standard Deviations	Minimum	Maximum
$ycap_{it}$	727	3.546468	5.321967	-28.042	32.892
$yinitial_{i,t0}$	744	5959.228	10948.23	78.40406	45225.2
to_{it}	690	97.81016	89.38046	13.88851	552.8398
inf_{it}	725	.6078375	6.445499	-.2209142	154.4438
fdi_{it}	734	3.927131	6.019503	-14.369	50.295
pop_{it}	744	1.620441	1.603365	-2.659709	15.0326
$govcon_{it}$	696	12.69264	5.245314	3.46	34.386
sav_{it}	687	23.89648	16.66285	-48.712	64.445
$lifeexp_{it}$	744	69.26361	6.520183	52.462	83.832

Table A.2: Statistical summary of transformed variables and instrumental variable

Variable	Observations	Mean	Standard Deviations	Minimum	Maximum
$ycap_{it}$	727	3.546468	5.321967	-28.042	32.892
$TO_{i,t-1}$	689	97.77727	89.44121	13.88851	552.8398
iv_{it}	690	-3.99e-08	42.91188	-147.7809	182.1079
$Linf_{it}$	725	-1.0591	.6532342	-3.912021	5.041389
fdi_{it}	734	3.927131	6.019503	-14.369	50.295
pop_{it}	744	1.620441	1.603365	-2.659709	15.0326
$govcon_{it}$	696	12.69264	5.245314	3.46	34.386
sav_{it}	687	23.89648	16.66285	-48.712	64.445
$lifeexp_{it}$	744	69.26361	6.520183	52.462	83.832

Table A.3: Statistical summary of dummy variables

Variable	Observations	Mean	Standard Deviations	Minimum	Maximum
$DBFTA_{it}$	744	.4099462	.4921543	0	1
$DMFTA_{it}$	1,119	.7417337	.4378769	0	1
$Bldc_{it}$	744	.0577957	.2335137	0	1
$Mldc_{it}$	1,119	.1090259	.3118111	0	1

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