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DEVASMITA JENA

EDUCATION

- Ph.D. (2019) - Centre of International Trade and Development (CITD), Jawaharlal Nehru University (JNU), New Delhi
  - Dissertation Title - The Role of Trade and Relative Backwardness in Explaining Income Convergence in the ASEAN and the EU: A Comparative Analysis
  - Ph.D. Supervisor – Prof. Alokesh Barua
- M.Phil. (2013) -CITD, JNU, New Delhi
  - Topic- Income Convergence among the ASEAN Countries: An Analysis of India's Potential Gain as its Strategic Partner
  - M.Phil. Supervisor – Prof. Alokesh Barua
- UGC-NET in Economics, 2012
- M.Sc. (Economics), 2008-2010, Indira Gandhi Institute of Development Research, Mumbai
- B.Sc. Hons (Statistics), 2005-08, Hindu College, University of Delhi

RESEARCH INTERESTS

International Trade, Applied Macroeconomics, Economic Growth and Development, Econometrics

WORK EXPERIENCE

Research Officer, April 2015-August 2019

Department of Economic Policy and Research (DEPR), Reserve Bank of India (RBI), New Delhi

Key Responsibilities:

- Preparing an exhaustive analytical assessment of the quarterly macro-economic and financial performance of eight northern states of India based on data on output, prices, public borrowing, and banking-related metrics. This assessment is presented as a memorandum in the quarterly meetings of RBI's regional board
- Supervised interns' research projects on 'Current Trade Scenario in India', 'India's Monetary Policy and Taylor Rule'.
- Training officers in macro-economics and delivering lectures to them on key macro-economic and monetary issues
- Conducting surveys of topical salience such as on food inflation or on issues of regional importance, bi-annual surveys on monetary and financial expectations and consolidating the results for Monetary Policy Strategy Committee meetings

- Preparing research related inputs to the Central Board of RBI and to RBI's central office
- Supervising and overseeing the preparation of data on state government finances as part of RBI's annual publication- 'State Finances: A Study of Budgets'
- Handling the administrative duties of the department and overseeing the functions of the department as the acting head, in the absence of the Director, DEPR, RBI, New Delhi

Officer on Special Duty, May 2017-May 2018

Financial Stability and Development Council (FSDC), Department of Economic Affairs (DEA), Ministry of Finance (MoF), Government of India (GoI), New Delhi

Key Responsibilities:
- Involved with the work related to Financial Stability Assessment Programme (FSAP) peer review of India by the IMF and the World Bank, 2017.
- Handling responsibilities related to all the meetings and deliberations of Financial Stability Board
- Responsible for work related to Central Board of RBI which involved preparing briefs, notes, and comments for all the agenda items of the meetings of Central Board of RBI after thoroughly researching on ongoing issues and collecting inputs from various departments of GoI, and key regulatory bodies for the information of Secretary (DEA).

Research Officer, April 2014-April 2015

Department of International Trade and Finance, Department of Economic Policy and Research, Reserve Bank of India, Mumbai

Key Responsibilities:
- Compilation, dissemination and analysis of data pertaining to International Trade statistics
- Tracking the movement of real effective exchange rates on a monthly basis
- Preparing monthly and quarterly trade review
- Preparing inputs pertaining to merchandise trade of India for Monetary Policy Strategy Committee meetings

Assistant Professor (Ad-hoc), August 2012-August 2013

University of Delhi, New Delhi

Key Responsibilities:
- Taught courses in economics (Microeconomics, Macroeconomics, International Trade, and Econometrics) to undergraduates

Research Intern, May 2009-July 2009

National Council of Applied Economic Research, New Delhi

Key Responsibilities:

Assisted Prof. Hari K. Nagrajan in NCAER's research project on 'Decentralization and Women Empowerment in Economic Outcomes'

PUBLICATIONS/ WORKING PAPERS

- Trade, Structural Transformation and Income Convergence: Empirical Evidence from the EU and the ASEAN (with Alokesh Barua), CITD Discussion Paper 18-04, JNU, 2018
- Book Review of "Global Financial Contagion: Building a Resilient World Economy after the Subprime Crisis" authored by Shalendra D. Sharma (Cambridge University Press: 2014), Reserve Bank of India Occasional Papers, Vol. 34, No. 1 & 2: 2013, 2015
- Implications of India-ASEAN Regional Cooperation: An Empirical Analysis (with Alokesh Barua), in Malhotra, Rashpal and Sucha Singh Gill (eds.), India's North-East and Asiatic South-East: Beyond Borders, Chandigarh: CRRID, 2015

CONFERENCES/ WORKSHOPS

- Azim Premji University's Second Workshop on Advanced Macroeconomics (Theme: Money and Economy), August 16 and 17, 2019, Bengaluru (role: Guest Resource Person)
- 54th Annual Conference of The Indian Econometric Society, March, 2018, Shri Mata Vaishno Devi University, Jammu and Kashmir (role: presented paper)
- Fourth International Conference on South Asian Economic Development, South Asian University, February, 2018 (role: presented paper and acted as a discussant)
- Departmental Winter Seminar of CITD, JNU, January, 2018, New Delhi (role: presented paper)
- NCAER Seminar: What does China's Rebalancing Mean for the Rest of Asia? September 5, 2016, New Delhi (role: invited participant)
- Conference on "Advancing Asia: Investing for the Future', organized by IMF, New Delhi, India, March 2016 (role: invited participant)
- DGCI&S – IGIDR Workshop on India's International Trade: Emerging Research Questions and Database, IGIDR, Mumbai, January 9, 2016 (role: invited participant)
- Study Circle Seminar of Department of Economic Policy and Research, Reserve Bank of India, Mumbai, November, 2014(role: presented paper)
- Conference on "India's North-East and Asiatic South-East: Beyond Borders", Centre for Research in Rural and Industrial Development, North-Eastern Hill University, Shillong, June 2014(role: presented paper)

WORK IN PROGRESS

- The Impact of Trade with ASEAN on India's Employment in Industrial Sector

PROGRAMMING AND COMPUTATIONAL SKILLS

STATA, R, SPSS, EViews (Basics)

PERSONAL INFORMATION

- Date of Birth: February 10, 1988
- Sex: Female
- Citizenship: Indian
- Languages: Hindi (fluent), English (fluent), Odiya (working), Bengali (working)

REFERENCES

- Professor Alokesh Barua

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Implications of India-ASEAN Regional Cooperation: An Empirical Analysis

Introduction

At Independence, the North Eastern Region was among the most prosperous regions of India. Sixty years on, the north-eastern region as a whole, and the states that comprise it, are lagging far behind the rest of the country in most of the important parameters of growth. It is recognized that the Partition of India and the denial, since the India-Pakistan war of 1965, of transit facilities to physically link all but 29 kilometres of the North East to the rest of India has severely limited the economic prospects of the North East. There is no doubt that the Government of India is serious about initiating a fast and rapid development process in the Northeast region (NER). The NER Vision 2020 which was released by the Prime Minister on 2 July 2008 aptly signifies the government's sincerity of intention to chalk out a meaningful path of development for the region. It is further recognized that an imaginative leap in foreign policy, defence policy and internal security policy, as much as in investment, infrastructure and commercial policy, is required to end the Region's geo-political isolation and put it on the path to accelerated and inclusive growth.

In the early 1990s, after the downfall of the Asom GanaParishad (AGP) government in Assam, the central government took on the role of developer by pumping a lot of money into the system, assuming that it will act as double edged sword. That is it will serve dual purpose - to contain extremism by bribing extremists to agree to return life in the region, to normal on the one hand, and to create an inducement mechanism, either with increased funds in the form of developmental 'packages' or 'projects', or through bribery that eventually trickles down to the public on the other. This can be termed as the first 'paradigm of development' experimented within Assam. Instead of lowering militancy, the policy contributed to increased militancy in the region, and the 'cheap/easy money' helped in the manifold expansion of corruption without any impact on growth. The policy therefore was a fiasco and a self-defeating experiment. Failing in this strategy, policy makers involved with the development of the Northeast began toying with another idea which involves the opening of a land route from the Northeast to the booming markets of East Asia, via Myanmar and China.

Protagonists of this idea trying to define it as the 'new paradigm of development' within India's Look East Policy framework, by arguing that 'South-East Asia in fact begins from the Northeast of India'! The essence of the argument is that the new land route, apart from being an alternate land route for India, would also contribute to an enlargement in the size of markets for the Northeast. It would enable the region to carry out a major industrialisation drive by tapping the markets of East and South-East Asia. While the idea is fascinating, closer introspection would reveal that the lack of an 'outside market' is not necessarily the sole constraint to development in the Northeast. In fact, in the initial phase of development, the outside market maybe irrelevant. Hence, the objective of this paper is to critically review this new 'paradigm of development' in the light of the past history of the Northeast, since exposure to international trade is not something new for the region. For this we will use the gravity model for trade due to Tinbergen (1962). An understanding of past failure helps us assess how relevant the Look East Policy is today or if it could be relevant in the future. However, before we take a critical look at this issue, we will examine the background to the circumstances in which the Look East Policy was enunciated by the Government of India.

The Look East Policy and India's Engagement with the ASEAN

India announced its "Look East" policy under the Prime Ministerial regime of Mr. Narashimha Rao in 1991 in an attempt to increase its engagement with the East Asian countries. The policy was motivated by the launch of economic reform and liberalization, the slow pace of regional cooperation and trade liberalization in South Asia, the rise of China, the economic success of Southeast Asian nations, and strong desire for greater integration with the world as India was the only major country in the world which had yet to become a member of a regional free trade club. With the disintegration of the Soviet Union and the gradual incorporation of Eastern Europe into the Western European economy, India had lost two of its privileged market links. Consequently, in 1992, it became a sectoral dialogue partner; for tourism, commerce, investment, and science and technology; of the Association of Southeast Asian Nations (ASEAN). India committed full dialogue partnership with ASEAN in December 1995, became a member of the ASEAN Regional Forum (ARF) in July 1996, and with annual 'ASEAN plus One' became summit-level dialogue partner since December 2002.

The second phase of "Look East" policy, under the Prime Ministerial regime of Atal Behari Vajpayee, commenced after a decade where thrust was given to enlarge the geographical scope with south-east Asian nations, to accelerate the signing of FTAs with the Asian groupings, proliferate physical connectivity (via air and road links) to Southeast Asia. In North East Vision 2020, it has been clearly mentioned that for making the Look East Policy meaningful for the region by connecting it with Southeast Asian Markets. For this, it has been emphasized that connectivity of north – east states of India with ASEAN should be strengthened.

The India-ASEAN Free Trade Agreement (AIFTA), under the broader framework of Comprehensive Economic Cooperation Agreement between India and the ASEAN (13th August 2009, Bangkok), came into effect on January 1, 2010 in relation to Malaysia, Singapore and Thailand and later with other countries of ASEAN. Initially the agreement is for trade in goods and now both the parties are pushing further for FTA in Services and Investment.

The North-East Challenge

There is fervent enthusiasm to bring the Northeast India upfront in India's Look East policy. This enthusiasm is driven by various factors and motives. One of the reasons is the entry of Myanmar to the ASEAN Club in 1997. Since Myanmar is strategically situated between India and Indo-China, Indian policy makers may have viewed this as an alternative way to reach out to East Asia and Southeast Asia through Myanmar[1] via the northeast. The geographical proximity of the Northeast border to the large and expanding Chinese markets is expected to facilitate expansion of Indian trade with China and help the Northeast integrate with East and Southeast Asia. The Northeast being a 'top priority' for the Indian government today, this seems to be a justifiable reason for its inclusion in the Look East Policy. Clearly, this demonstrates a development concern for the Northeast. The security concerns—both external

[1]The Tamu (Myanmar)-Moreh border post was opened in April 1995. The construction of a 160 km road on Burmese territory from Tamu to Kalewa and then to Kalemyo in the Kabaw Valley is an important step towards this direction. However, the road connecting Kalemyo to Mandalay is still in very bad shape. The Kaladan Multimodal Transport Project (on the Kaladan River) plans to connect Mizoram to the Burmese harbour city of Sittwe. This would facilitate trade through the new transport corridor going around Bangladesh. It would then connect the Northeast to the Indian Ocean. There is a third project aimed at reviving the old Ledo Road (also known as the Stillwell Road). This road connects Assam to the southwestern Chinese province of Yunnan through the Upper Burma jungle (Kachin state).

and internal—have come to play a key role in the context of the Northeast. The external security concern is of course the 'China factor' as mentioned above. Even today China does not openly accept Tawang as part of India. While relations with the military regime in Myanmar are stable, its growing economic links with China create border concerns for India. The external security problems are also linked with internal security problems within the Northeast. These are serious security considerations generally for the country and especially for the Northeast, which justify including the Northeast as a priority concern within the framework of the Look East Policy.

Motivation for the Study

There seems to be scope for gains from FTA[23] to India and in particular, to the Northeast India. It is argued that India-ASEAN integration will lead to increased trading opportunities for the Northeast region with the promising markets of East and Southeast Asia (Baruah 2005: 12). International trade is expected to play the role of an 'engine of growth' to transform the Northeast into a modernised industrial region. Thus, how the FTA under the Framework Agreement on Comprehensive Economic Cooperation between the ASEAN and India will boost the trade potential and welfare of the Northeast India is an interesting field of study and it needs to be quantified as far as possible. In order to assess India's gain from trade due to AIFTA, we shall be using an extended version of gravity model which will be discussed in detail in the following section.

Hypothesis, Methodology and Data

At the outset, let us state the hypothesis of the study.

Hypothesis: Northeast India may potentially gain from economic cooperation between India and the ASEAN nations.

The hypothesis will be empirically tested in the next section. The methodologies and data required for empirical analysis are discussed elaborately in the following sub-sections.

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[2]The detailed provisions of Free Trade Agreement under the Framework Agreement on Comprehensive Economic Cooperation between India and ASEAN are enlisted in the Appendix A1.
[3] Refer Table A1 in the appendix for India-ASEAN trade figures.

Model to quantify gains from trade: The Gravity Model

For the empirical analysis of the trade potential between India and ASEAN, the Gravity model is incorporated. The gravity model provides a cross-section alternative to inter temporal extrapolation. Using this approach, the intensity of trade between two trading countries is projected as a function of a number of basic determinants. Firstly, a reference group of countries which are assumed to exhibit "normal" trade relations are considered in the reference or base model. The estimates of parameters based on the reference group are then applied to the countries whose potential trade flows are of interest. The gravity equation states that the bilateral trade between two countries is directly proportional to the product of the countries' GNPs and inversely proportional to the distance between them. Other variables that are included in the model are country size represented by the population, and dummy variables such as common border, common colony, and common language. These dummy variables capture the idea as to how contiguity, geographical and cultural proximity between the trading countries act as stimulus to the extent of trade between them. Our model will be:

$$\ln IMPORT_{ijt} = \beta_0 + \beta_1 \ln GNP_{it} + \beta_2 \ln GNP_{jt} + \beta_3 \ln DIST_{ij} + \beta_4 \ln GNPPc_{it} +$$
$$\beta_5 \ln GNPPc_{jt} + \beta_6 \ln ComBorder_{ij} + \beta_7 ComOffLang_{ij} + \beta_8 ComEthnicLang_{ij} +$$
$$\beta_9 Col_{ij} + \beta_{10} \ln(1 + tariff_{ijt}) + \beta_{11} ASEAN_t + \beta_{12} EU_t + \beta_{13} Mercoser_t +$$
$$\beta_{14} NAFTA_t + \beta_{15} APTA_t + \sum_k \alpha_k years_k + \epsilon_{ijt}$$

The subscript i and j designate reporter country i and partner country j and subscript t designate the time period (i.e. the years under consideration). The variables of the gravity model are discussed as follows. The dependent variable, $IMPORT_{ijt}$ denote the value of total import to country i from country j at time t. On the right hand side of the model, the gross national products at time t of both the reporter and partner countries (GNP_{it} and GNP_{jt} respectively) and GNP per capita (at time t) of both reporter and partner countries ($GNPPc_{it}$ and $GNPPc_{jt}$) have been included. GNP per capita can be taken as the proxy for degree of development in the country and therefore, allows us to examine the link between a country's trade and its stage of development (Brulhart, 1999). The explanatory variable, $DIST_{ij}$ symbolize the distance between the trading centers or capitals of the two trading countries. Then the model has dummy variables - $ComBorder_{ij}$, $ComOffLang_{ij}$, $ComEthnicLang_{ij}$ and Col_{ij}. $ComBorder_{ij}$ indicates whether the two countries share common border, $ComOffLang_{ij}$ indicates whether the two countries have common official language, $ComEthnicLang_{ij}$ indicates whether two countries have common ethnic language (i.e., spoken by at least 9% of

population in both the countries) and Col_{ij} indicates whether two countries have ever had a colonial link. The variable, $tariff_{ijt}$, is nothing but the average tariff rate on bilateral trade between the countries at time t. To capture the intensity of bilateral trade agreements on the volume of imports, agreement dummies – $ASEAN_t$, EU_t, $MERCOSER_t$,$NAFTA_t$, $APTA_t$ – are included in the model. These dummy variables take value 1 if the two trading countries under consideration belong to the particular agreement at a particular year under consideration and 0 otherwise. The year dummies, $years_k$, have also been included in the model to capture year specific variations. The model is closed with the error term to capture random factors, other than the explanatory variable, affecting the volume of imports. All the variables are expressed in logarithmic form, except for the dummy variables. The logic behind including the average rate of tariff rate in the form of $\ln(1 + tariff)$ is to keep the margin for an average tariff rate of zero. The regression coefficients are the βs.

The explanatory variables GNP and GNP per capita of the reporter and partner countries capture the idea that larger countries will tend to trade more with each other, and the countries that are more similar in their relative sizes will also trade more. The geographical proximity, reflected by the distance variable, promotes bilateral trade flows as it reduces transport and information costs. Sharing borders, colony, and ethnic and official language creates affinity between the countries in terms culture and hence preference. This will lead to an increase the trade flows between any given pair of countries. The tariff variable captures the influence of average rate of tariff on the bilateral trade. A negative coefficient is expected on the distance and tariff variable (as both restrict the trade flows) and positive coefficients in all other variables. The coefficients on the population variable and year dummies are ambiguous.

Since the variation across the years has been captured through the year dummies, the gravity equation is estimated using unbalanced pooled OLS regression for 166[4] countries for the period 1990 to 2010. The time period is decided subject to the availability of the data. It has been tried to consider as wider a time period as possible so that the estimates of the coefficients of the models are robustly calculated. This gives us the benchmark gravity model. After the model is estimated, the likely increase in the potential trade between India and ASEAN with India's FTA with the ASEAN nations can be predicted based on the OLS coefficients of the benchmark Gravity Model.

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[4] The list of 166 countries is given in the Appendix A2.

Database

1. Annual data on aggregate imports in goods and services (in $ '000) for the period 1988 to 2010 for 166 countries and their major trading partners is sourced from UN COMTRADE.

2. The data on population, GNP per capita[5] and aggregate tariff[6] is taken from World Bank Database (World Development Indicators).

3. Data on distance, language, colony and border is gathered from CEPII database[7].

Estimation Results

In our attempt to determine the elasticities of various factors determining the trade between trading partners the baseline extended version of gravity model as stated in the previous section. The coefficients so estimated using this model will be used for simulation exercise in the next section.

The table below displays the results of the Ordinary Least Squares (OLS) estimation on pooled cross-section data from 1990 to 2010. Year dummies 1991, 2007, 2008, 2009, and 2010 have been dropped as they have found to introduce the problem of multicollinearity in the model. This means that the effect of these years on the logarithm of imports will already be captured by the other years. Hence, it is judicious to drop these years as explanatory variables. Similarly, the dummy variables MERCOSER, SAFTA and NAFTA are dropped as these variables are also introducing multicollinearity in the regression model.

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[5] GDP per capita is in terms of purchasing power parity. It is calculated keeping base year to be 2005 and is expressed in international dollars.

[6] The aggregate tariff of a given country is the simple mean of applied tariff on all traded goods and in percentage terms.

[7] CEPII is a French research center in international economics. It produces studies, researches, databases and analyses on the world economy and its evolution. Founded in 1978, it is part of the network coordinated by the Economic Policy Planning for the Prime Minister. CEPII makes available a "square" gravity dataset for all world pairs of countries, for the period 1948 to 2010, allowing the estimation of international flows as a function of GDP, population and trade costs. The main variables relating to trade costs come from GeoDist, the CEPII distance dataset. A few variables are added to GeoDist. Furthermore, Gravity is arranged in such a way that it can be easily merged with any matrix of bilateral flows (trade, FDI, migrations, or other types of bilateral flows), using standard ISO codes for countries and for any year between 1948 and 2006.GDP and populations come mainly from the World Bank Development Indicators (WDI). Regional trade agreements and currency unions are built from Baier and Bergstrand (2007), the WTO web site, Frankel (1997) and Glick and Rose (2002).

Table 1: Results of the baseline Gravity Model

Dependent Variable: lnIMPORT$_{ijt}$ Independent Variables	Coefficients* (with Standard Errors)	p-values
Constant	-37.78813 (.1721003)	0.000
lnGNP$_{it}$	.9206158 (.0037394)	0.000
lnGNP$_{jt}$	1.054469 (.0037793)	0.000
lnDist$_{ij}$	-1.102866 (.0093088)	0.000
lnGNPPc$_{it}$	.2213305 (.0066785)	0.000
lnGNPPc$_{jt}$	.4133166 (.0061211)	0.000
ComBorder$_{ij}$	.9268286 (.046525)	0.000
ComOffLang$_{ij}$	.8100729 (.0321198)	0.000
ComEthnicLang$_{ij}$	.3867929 (.0314001)	0.000
Col$_{ij}$	.739958 (.0659553)	0.000
ln (1+ tariff$_{ijt}$)	-.0610932 (.0104121)	0.000
ASEAN$_t$	1.282149 (.1092614)	0.000
EU$_t$	.1842128 (.0617071)	0.003
APTA$_t$	-1.288217 (.3810162)	0.001
BIMSTEC$_t$	.4045285 (.1950063)	0.038
year_92	-.1211741 (.1341614)	0.366
year_93	.5593153 (.1077049)	0.000
year_94	.2411064 (.0845886)	0.004
year_95	.3405961 (.0826832)	0.000
year_96	.0837834 (.0806162)	0.299
year_97	.2167124 (.0799315)	0.007
year_98	.1156101 (.0799278)	0.148
year_99	.0800216 (.0792839)	0.313
year_00	-.0333724 (.0787758)	0.672
year_01	-.1741419 (.0785054)	0.027
year_02	-.1772004 (.078654)	0.024
year_03	-.1347116 (.0789846)	0.088

year_04	-.152068 (.0800865)	0.058
year_05	-.1997069 (.0789362)	0.011
year_06	-.1654463 (.0790872)	0.036

*5% level of significance

For this model, the value of coefficient of determination (R-square), which gives how well the variation in dependent variable is explained by the variations in the explanatory variables or the independent variables, is 0.58. This value is pretty good and indicates that the gravity model is well fit. Almost all the gravity variables are highly statistically significant at 5% level of significance and retain their expected signs. The estimated coefficients on the log of GNPs of reporter and partner countries are approximately 0.92 and 1.05, suggesting that volume of import increases with country size almost proportionately. Also, the coefficients attached to the per capita GNP of both the reporter and partner countries are statistically significant and positive - 0.22 and 0.41 respectively. This is in line with the theory of standard gravity model that says that countries with similar and large levels of output (GNP) will trade more than countries with dissimilar or lower levels of GNP. This explanation is also supported by the Helpman-Krugman theory (1985). In addition, the Linder (1961) hypothesis says that countries with similar levels of per capita income will have similar preferences and similar but differentiated products, and thus will trade more with each other. The results confirm the importance of distance and common border in bilateral trade flow between countries. Distance is taken as a proxy for transport cost. Also, sometimes it reflects the extent of cultural differences. Greater geographical distance is believed to be the representation of greater cultural differences among the countries. Greater cultural variance hinders trade by impeding communication and negotiations and search for new avenues of trade. The dummy of common border is, in addition to the inclusion of the distance variable, accentuating the fact that effective distance between neighbouring countries that may often engage in large volumes of border trade. Our analysis gives the coefficient on the log of distance to be around -1.1029, indicating that when distance between two countries is increased by 1%, trade between them falls by about 1.1%. The coefficient on common border dummy variable is about 0.9268. This means that two countries sharing a common border trade 2.52 times [exponential of 0.9268 = 2.52] more than two otherwise similar countries. The results reflect considerable positive effect of common official and ethnical language and common colonial link on the net volume of trade. The rationale behind this is result is quite obvious as common official or ethnic language is expected to reduce the transaction costs as

speaking the same language helps facilitate trade negotiation and shared history (captured by dummy variable of common colony) is expected to reduce transaction costs caused by cultural differences. The coefficients attached to the population variables of both reporter and partner countries are negative. The estimated negative coefficient of -0.0611, on log of (1+tariff), advocates that if the tariff is reduced, there will be a noteworthy increase in the amount of import from the partner country to the reporter country. The coefficients corresponding to the dummies ASEAN, EU, BIMSTEC are all significantly positive supporting the notion that if both the reporter and partner countries are the members of any of the economic community of ASEAN, EU or BIMSTEC the trade transactions (as captured by log of imports in this model) between the countries increase considerably. However, the coefficient corresponding to APTA is negative and is statistically significant. This might be an indication that APTA is not performing well in terms of trade. The coefficients of the year dummies which are positive with respect to the base year reflecting increase in import in every year are statistically significant and this may be due to globalization and new-regionalism. The coefficients of the year dummies which are negative with respect to the base year are statistically insignificant and hence they are not significantly influencing the variations in the logarithm of imports.

Likely Increase in Trade: Simulation Exercise

We use the coefficients estimated from the above baseline gravity model to calculate the likely increase in the bilateral imports from ASEAN to India and vice-versa due to India becoming a member of ASEAN and also due to phased reduction of tariff rates based on the current levels of tariffs and also due to infrastructure development as a result of which the non-tariff barrier lowers. We assume distance to capture the extent of non-tariff barrier. For simplicity, we make an assumption of homothetic preference, i.e., the ratio demand of commodity baskets in states relative to the country as a whole remains equal. This means that the composition of preferred consumption of all the states of India is determined strictly by the relative prices of the goods, and not by the level or distribution of income in different states or regions. Therefore, it can be consequently assumed that the ratio of imports/exports of the states as compared to imports/exports of India as a whole is constant.We also assume that estimated imports equal potential imports. The comparison between potential imports is made under the following two scenarios:

- India is not a member[8] of ASEAN (in this case, the dummy variable, ASEAN, in the gravity model takes value zero)

- India is a member of ASEAN (in this case, the dummy variable, ASEAN, in the gravity model takes value one)

Further, the second scenario is again dealt under the following hypothetical sub-scenarios:

i)   25% across the board tariff cuts by India and ASEAN

ii)   50% across the board tariff cuts by these countries

iii)   75% across the board tariff cuts by these countries

iv)   100% across the board tariff cuts, i.e., free trade between them.

The difference between the 'estimated import' and the 're-estimated import' integrating the 4 scenarios respectively will give the net change in volume of import between India and ASEAN when India becomes a member of ASEAN and as they eventually move from Preferential Trade Agreement to Free Trade Agreement.

The following tables give the simulation results, based on the gravity model, of likely increase in India's imports from ASEAN and vice-versa if India and ASEAN become partners in trade and if India's and ASEAN's existing tariffs are reduced by 25%, 50%, 75%, 100% i.e., free trade.

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[8] Here member means that India is a full strategic partner of ASEAN. When it is a strategic member of ASEAN, the ASEAN dummy takes value 1. This is because as a strategic partner, India accrues all advantages of a full economic member of ASEAN. However, all other socio-political benefits of being a member of ASEAN are not given to India. But, in this study we are not concerned about socio-political benefits. The term member, henceforth, means strategic partner.

Table 2: India's imports from ASEAN under different tariff scenarios

India's Import from ASEAN (When India is not a member of ASEAN)	Increase in India's Import from ASEAN (When India is a member of ASEAN)				
Tariff Rate (as in 2009): 9.15	*Tariff Rate (as in 2009): 9.15*	*25% tariff cut*	*50% tariff cut*	*75% tariff cut*	*100% tariff cut*
20.72	74.66	75.83 (1.57%)	77.45 (3.73%)	79.99 (7.13%)	86.02 (15.21%)

The base year chosen for simulation and comparison is 2009. This is because in 2010 India signs FTA with the ASEAN nations. As can be seen from the above tables, when India becomes a member of ASEAN, its import from the group, Singapore and Thailand increases approximately by 54 units. Due to PTAs and FTAs, the India will gain from trade. If India offers 25% tariff reductions on all of its imports from the ASEAN, its total imports from the latter will increase by 1.57 % and if such reductions are extended to 50% across the board, the increase is by 3.73% and with 75% reduction in tariff the rise is 7.13%; and if there is FTA between these two countries, India's imports from ASEAN will be increased by 15.21%.

Table 3: ASEAN's imports from India under different tariff scenarios

ASEAN's Import from India (When India is not a member of ASEAN)	Increase in ASEAN Import from India (When India is a member of ASEAN)				
Tariff Rate (as in 2009): 5.00	*Tariff Rate (as in 2009): 5.00*	*25% tariff cut*	*50% tariff cut*	*75% tariff cut*	*100% tariff cut*
10.25	36.95	37.48 (1.44%)	38.19 (3.35%)	39.23 (6.18%)	41.23 (11.56%)

As can be seen from the above table, when India becomes a member of ASEAN, the ASEAN nations import more from India. If ASEAN offers 25% tariff reductions on all of its imports from India, its total imports will increase by 1.44% and if such reductions are extended to 50% across the board, its imports from India will be increased by 3.35% and with 75% reduction in tariff the rise is 6.18%. If there is FTA between these two countries, ASEAN's imports from India will be increased by an impressive 11.56%.

On comparing both the tables, it can be observed that FTA between India and ASEAN will be advantageous to ASEAN and disadvantageous to India (as India's imports are higher than that of ASEAN's) in the short run because of high tariff regime in India and low tariff regime in ASEAN. However, in the long run, FTA between India and ASEAN can be advantageous to both ASEAN and India, if the certain obstructions can be answered (which we shall discuss in a while)

Impediments to Trade and Measures that can be taken thereof

The immediate question that arises from the analysis is that why the opening is up of trading opportunities for the Northeast region with the promising markets of East and Southeast Asia does not seem to be fulfilling the expectation of "engine of growth". Following possible factors may be hampering the opportunity.

Tariff Regime: When India gives duty free access to ASEAN countries, tariff revenue previously collected on the imports from ASEAN turns into exports revenues for the exporting sectors of ASEAN community as a whole, which is obviously very high because of high tariff regime in India. In this process ASEAN exporters will be much gainers compared to Indian exporters. This is because tariffs in ASEAN community are low (with Singapore displaying the ideal average tariff rate of zero); Indian exporting firms have less to gain from the tariff free access in ASEAN economies. Conversely, when member countries of ASEAN give duty free access to India, tariff revenue previously collected from the imports from India turns into export revenues for the export firms of India, which will be obviously very low because of lower tariffs in the ASEAN nations. Since tariffs in India are very high, ASEAN exporting sectors have more to gain from the duty free access to India and Indian exporting firms will gain much less because of duty free access to ASEAN, which is having very low tariffs. As long as India continues to have higher tariffs than ASEAN, the danger of potential losses from the transfer of tariff revenue to the ASEAN firms in the form of higher profits will remain. Hence, it is more rational to move towards PTA in a phased manner on selected items and services over a time horizon and then eventually move to FTA with free flow of goods, services, investment, labour, and capital. Also, in order to tap gains from trade with the ASEAN, India has to develop a more mature and organized infrastructure and connectivity. Apart from this, trade also needs to be facilitated by a host of administrative measures which facilitate the growth of trade.

Governance and Security: Governance and security should assume central importance in any development agenda for the Northeast region. The problem arises partly from the complete failure on the part of mainstream India to assimilate the region and partly from diversities within the region itself. The region is inhabited by diverse communities from different ethno-linguistic origins, religious beliefs and tribal practices, cultural ethos and inherited heritages and above all, an irreconcilable historical past. Their interests are often in conflict with each other and their aspirations are not easily reducible to any common denominator. What is necessary is a rise of legitimate sub-nationalism which could unite the region into a collective unity of economic and political interests. Unless this is achieved, political instability is bound to arise. The question of governance therefore should be posed in a broader perspective in the context of the Northeast. It is not sufficient to club all the states into one group—say, the Northeast—it is necessary to be able to create a unified economic and political vision for the Northeast. One possible way might be through increasing

interdependences amongst the states by means of greater economic unification of the region. A necessary prerequisite for such unification is synchronisation of development policies of the states. What needs to be emphasised is that without a centralised approach to governance in the Northeast, it is not possible to achieve permanent peace in this region. And unless there is permanent peace, no development efforts will ever bear any fruit. This essentially means that a Northeast political vision must precede a Northeast economic vision.

Law and Order: The Northeast has constantly been grappling with ethnic violence and terrorism of innumerable forms. There has been continuous violent upsurges and the absence of law and the order have had a alarming impact on the performance of the economy. This has injected uncertainty and insecurity in the minds of economic agents who take decisions regarding production and investment within the region. It is a fact that there has been a substantial transfer of development funds from the centre to this region. Thus of funds for development are no longer constraints to growth in the region.Yet the economy is stagnating or moving slowly due to continuous insurgencies in this area.

Existence of Markets: Market-driven growth is based on the assumption of the existence of an efficient market system. A market, by providing price signals, determines the patterns of resource allocation in society. Freedom of action and individual rights are necessary prerequisites for the free interplay of demand and supply forces to determine the true scarcity values of goods and services leading to optimal allocation of resources in a market economy. However, for an efficient market to exist certain basic preconditions need to be fulfilled like existence of proper law and order and well defined property rights. This will enable smooth and efficient transaction between agents can be carried on by those involved in the transaction without any fear or coercion. However, markets in the Northeast do not exist due to deterioration in law and order.

Development of Infrastructure: Infrastructure development is crucial for the growth and development of any region. By infrastructure development we mean an improvement in the delivery systems of essential services such as water supply, sanitation, electricity, roadsand transport and telecommunication. Physical infrastructure is crucial to increase connectivity within the region, as improved connectivity would leadto an increase in the size of the market in the region. Transportation and inadequate power has been a major problem for the growth of industrial and other development activities in the north-east region.

Comparative Advantage: Let us now examine in what kinds of commodities the Northeast region could develop a comparative advantage, to enable it to export to the East and Southeast Asian countries. India's exports to the East and Southeast Asia is dominated by mineral fuels and oil, metallic products, jewelry products, chemicals, iron and steel, ships, boats and floating structures, electrical machinery and equipment, vehicle parts, food and animal fodder and cotton products. Tea, coffee and rubber constitute a very small portion of India's exports to East Asia. Thus, the majority of India's export items consist of manufacturing goods. It is obvious therefore that the Northeast does not seem to have a comparative advantage in any of India's exports to these countries. However, the Northeast has potential advantages in many resource-based products which have not yet been properly tapped. Being rich in forest resources, with favorable climatic conditions for horticultural and floricultural products, the region can export a wide variety of forest-based products such as rubber, vegetables, valuable flowers, processed wood products and furniture. However, to develop a comparative advantage in these products, large-scale production and specialization is necessary.

Conclusion

The long – standing desire of India to be a member of the ASEAN bloc has now come into a reality. The emerging trading arrangements with the ASEAN bloc have generated a lot of euphoria about the future prospect of economic growth in India. In particular, it has been argued that it will create enormous prospects of trade led industrialization and growth for the North-eastern region. Such expectation is founded on the fact that the North-East India shares with the ASEAN nations a common border and long historical ties, linguistic and cultural similarities and a common heritage of civilization. This commonness should facilitate rising trade with these nations for the North – eastern states and hence the region is expected to gain from it. In this paper we try to quantify the bilateral trade flows and welfare gains from the view point of the Northeast region by using an extended version of the gravity model and also conducting a simulation exercise. Our results show that at least in the short run the Northeast region is unlikely to derive much gain from trade. Perhaps, the region suffers from other constraints to foster industrialization and hence we conclude that mere trading opportunities per se may not be sufficient inducement for industrialization and growth.

Appendix

A1. Provisions of Free Trade Agreement under the Framework Agreement on Comprehensive Economic Cooperation between India and ASEAN

Article 2 of the Framework Agreement of on Comprehensive Economic Cooperation between the Republic of India and the Association of South East Asian Nations, the Parties agree to enter into negotiations in order to establish an India-ASEAN Regional Trade and Investment Area (RTIA), which includes a Free Trade Area (FTA) in goods, services and investment, and to strengthen and enhance economic cooperation through the following:

a. *"progressive elimination of tariffs and non-tariff barriers in substantially all trade in goods;*

b. *progressive liberalisation of trade in services with substantial sectoral coverage;*

c. *establishment of a liberal and competitive investment regime that facilitates and promotes investment within the India-ASEAN RTIA;*

d. *provision of special and differential treatment to the New ASEAN Member States"*

Trade in Goods: A Snapshot of Article 3

"With a view to expediting the expansion of trade in goods, the Parties agree to enter into negotiations in which duties and other restrictive regulations of commerce (except, where necessary, those permitted under Article XXIV (8) (b) of the WTO General Agreement on Tariffs and Trade (GATT)) shall be eliminated on substantially all trade in goods between the Parties".

Each ASEAN member also as each one of the ASEAN nation has separate tariff reduction schedule vis-à-vis India. In spite of the variability among the tariff schedules they share certain common features as outlined in Article 4 and Annex 1 of the Agreement (goods section). The tariff lines are divided into four broad categories (see Table 1), viz., Normal Track, Sensitive Track, Special Products, Highly Sensitive Lists and Exclusion List according to the intensity of tariff reduction or elimination commitments Normal Track products are divided into two sub-groups Normal Track 1 and 2. In Normal Track 1 for India, Brunei, Indonesia, Malaysia, Singapore, and Thailand the reduction process will commence on 1 January 2010 and complete elimination would be achieved by 31 December 2013.

Philippines, Cambodia, Lao PDR, Myanmar, and Viet Nam are given a grace period up to 31 December 2018 for completely eliminating the tariffs. In Normal Track 2, complete elimination would be achieved before 31 December 2016 for Brunei, Indonesia, Malaysia, Singapore, Thailand and India. But, Cambodia, Lao PDR, Myanmar, and Viet Nam can wait till 31 December 2021 for achieving complete elimination.

Trade in Services: Article 4

The negotiations related to trade in services include (as it appear in the Article 3 of the agreement):

- *"progressive elimination of substantially all discrimination between or among the Parties and/or prohibition of new or more discriminatory measures with respect to trade in services between the Parties, except for measures permitted under Article V(1)(b) of the WTO General Agreement on Trade in Services (GATS)*
- *expansion in the depth and scope of liberalization of trade in services beyond those undertaken by India and ASEAN Member States under the GATS; and*
- *enhanced cooperation in services between the Parties in order to improve efficiency and competitiveness, as well as to diversify the supply and distribution of services of the respective service suppliers of the Parties"*

Trade in Investment: Article 5

"To promote investments and to create a liberal, facilitative, transparent and competitive investment regime, the Parties agree to:

- *enter into negotiations in order to progressively liberalize their investment regimes*
- *strengthen cooperation in investment, facilitate investment and improve transparency of investment rules and regulations*
- *provide for the protection of investments"*

A2. List of 166 Countries

Afghanistan	Albania	Algeria	Angola	
Antigua&Barbuda	Argentina	Armenia	Australia	Azerbaijan
Bahamas	Bahrain	Belize	Bangladesh	Barbado
Belarus	Benin	Bermuda	Bhutan	Bolivia
Brazil	Botswana	Bosnia&Herz	Brunei	Bulgaria
Burkina Faso	Burundi	Cambodia	Cameroon	Canada
Cape Verde	Central Africa Rep	Chad	Chile	China
Colombia	Comoros	Congo DR	Congo, Rep.	CostaRica
Coted'Ivoire	Croatia	Cuba	Cyprus	CzechRep.
Djibouti	Dominica	Dominican Rep	Ecuador	Egypt
El Salvador	Equatorial Guinea	Eritrea	Estonia	Ethiopia
Fiji	Gabon	Gambia	Georgia	Ghana
Grenada	Guatemala	Guinea	Guinea-Bissau	Guyana
Haiti	Honduras	Hong Kong	Hungary	Iceland
India	Indonesia	Iran	Israel	Jamaica
Japan	Jordan	Kazakhstan	Kenya	Korea
Kuwait	Kyrgyz Republic	Lao, PDR	Latvia	Lebanon
Lesotho	Liberia	Libya	Lithuania	Macao
Macedonia, FYR	Madagascar	Malawi	Malaysia	MaldivesMali
Malta	Mauritania	Mauritius	Mexico	Mexico
Moldova	Mongolia	Morocco	Myanmar	Mozambique
Namibia	Nepal	Niger	New Zealand	Nicaragua
Nigeria	Norway	Oman	Pakistan	Panama
Papua New Guinea	Paraguay	Peru	Poland	Philippines
Qatar	Romania	Rwanda	RussianFed.	Samoa
Sao Tome & Principe	Saudi Arabia	Senegal	Serbia & Montenegro	
Seychelles	Slovenia	Sierra Leone	Singapore	SlovakRep.
Somalia	SolomonIsland	South Africa	Sri Lanka	Sudan
St.Kitts&Nevis	St. Lucia	St. Vincent	Suriname	Swaziland
Switzerland	Tanzania	Thailand	Togo	Tonga
Trinidad & Tobago	Tunisia	Turkey	Turkmenistan	Uganda
USA	Ukraine	United Arab Emirates	Uruguay	Uzbekistan
Vanuatu	Venezuela	Vietnam	West Bank & Gaza	
Yemen	Zambia	Vietnam		

Table A1: India's Trade with ASEAN Member Countries (in US$ Million); Source: Annual Report 2010-11 0f Ministry of Commerce, India

Country	2008-09			2009-10			2010-11(up to September 2010)		
	Exports	Imports	Total Trade	Exports	Imports	Total Trade	Exports	Imports	Total Trade
Brunei	17.64	397.52	415.16	24.43	428.65	453.08	10.65	85.87	96.52
Cambodia	46.9	2.72	49.62	45.54	5.05	50.59	28.08	3.35	31.43
Indonesia	2559.82	6666.34	9226.16	3059.52	8551.62	11611.14	2242.07	4301.66	6543.73
Lao PDR	9	0.53	9.53	16.93	20.05	36.98	2.39	0.13	2.52
Malaysia	3419.97	7184.78	10604.75	2835.38	5176.24	8011.62	1989.96	2929.93	4919.89
Myanmar	221.64	928.97	1150.61	207.97	1289.35	1497.32	129.87	610.72	740.59
Philippines	743.77	254.77	998.54	748.71	312.71	1061.42	371.47	204.96	576.43
Singapore	8444.93	7654.86	16099.79	7568.29	6163.91	13732.2	4643.38	3488.34	8131.72
Thailand	1938.31	2703.82	4642.13	1740.1	2930.13	4670.23	1088.47	1976.11	3064.58
Vietnam	1738.65	408.66	2147.31	1838.87	521.8	2360.67	1102.12	449.72	1551.84
ASEAN	19140.63	26202.97	45343.6	18085.74	25399.51	43485.25	11608.47	14050.8	25659.27
India's total Trade	185295.36	303696.31	488991.67	178662.17	286822.8	465484.94	105351.89	161449.28	266801.17
Trade with ASEAN as %age of total	10.33%	8.63%	9.27%	10.12%	8.86%	9.34%	11.02%	8.70%	9.62%

References

Barua, A. (2012), "Regional Trade Arrangements and the WTO: Implications for India with Special Reference to the North East". In *India-ASEAN Economic Integration: Opportunities and Challenges for India's North-East. Macmillan Publishers, 2012*

Barua, A and Das, S. (2008), "Perspectives on Growth and Development in the Northeast: The Look East Policy and Beyond". *Margin – The Journal of Applied Economic Research 2 : 327-350*

Bhattacharya, S.K. and BhattacharyaB.N. (2007), "Gains and Losses of India-China trade Cooperation – a Gravity Model Impact analysis".*CESIFO Working Paper No. 1970 category 7: trade policy*

Brulhart, M and Kelly, M. (1999), "Ireland's trading potential with Central and Eastern European countries: a Gravity Study". *The Economic and Social Review, Vol 30: 159-174*

Dash, P. K. (2010), "India-ASEAN: Trade in goods agreement". *SME Times, 20 January 2010. New Delhi, India*

Economic Survey 2011-2012. *Ministry of Finance, Government of India.*

Economic Survey 2012-2013. *Ministry of Finance, Government of India.*

Helpman, E. and Krugman, P. (1985), "Market structure and foreign trade: Increasing returns, imperfect competition and the international economy". *The MIT Press*

Regional Integration: the ASEAN Vision in 2020. *IFC Bulletin no. 32*

Trade, Structural Transformation and Income Convergence: A Comparative Analysis of the EU and the ASEAN Experiences

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Abstract

The present study proposes a comparative analysis of the role of trade in income convergence across the EU and the ASEAN nations via its impact on structural transformation in these two blocks of countries. While linear trend analysis of Theil index of inequality shows that both the EU and the ASEAN have experienced income convergence during 2000-2017, polynomial trend analysis shows that the process may not have continued over later period. Panel data analysis of Chenery-Syrquin model shows while that trade has enhanced service-orientation in the EU and has brought down the income shares of agriculture and industries; it enhanced both industry-orientation and service-orientation in the ASEAN and has brought down the income share of agriculture. The poor countries within the EU seem to have gained in the share of both industry and services, although the gain in share of services is lesser as compared to the gain in share of services of the high-income countries in the EU. The lower income countries within the ASEAN have gained in terms of shares of services and industrial orientation, however, the gains have not been considerable enough to sustain the process of income convergence in the ASEAN.

JEL Classification: F0, F1, F6, O1, O4

Keywords: Trade, Structural Transformation, Chenery-Syrquin Model, Theil Index of Inequality, Income Convergence, Economic Integration

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I.   Introduction

Economic growth is almost invariably associated with structural transformation within an economy (See, Duarte and Restuccia, 2010; Caselli and Coleman, 2001; Hnatkovska and Lahiri, 2014) which result in reallocation of productive resources essentially from the primary agricultural sector to the industrial and service sectors (See, Fisher, 1939; Clark, 1940; Lewis, 1954 and Kuznets,1966). The general pattern of the structural transformation process was quantitatively demonstrated by Chenery (1960), Chenery and Taylor (1968) and Chenery and Syrquin (1975, 1989) among many others. The central argument that emerges is that as a nation initiates its development process with primary production, the economy characterizes structural transformation in terms of shifting of resources away from the primary to newly emerging sectors which leads to creation of new employment opportunities, increase in skill formation via enhancement of education, infrastructure development, change in consumption demand and above all income distribution between different classes in society. One of the important questions that arise from such structural transformation is whether economic growth reduces income inequality and leads to equalization of income or widens income differences within the country. A similar question may be addressed in a globalized framework by asking whether a similar tendency may be witnessed across countries as well (See, Kuznets, Miller and Easterlin, 1960; Kim, 1998).

The central argument of this paper is posed within an explicit presupposition that the forces of international trade expedite the process of structural transformation in a much more vigorous manner (See, Matsuyama,1992, 2009; Coleman II, 2007; Deardorff and Park, 2010) by inducing a shift of resources towards the production of export specialization. Export specialization in staple goods leads to increased income as shown by Douglass North (1961), an important aspect of trade and growth virtually ignored by the entire edifice of neoclassical trade and growth literature. Besides, there of course are the usual gains from specialization and trade as demonstrated by Samuelson that trade allows an economy to enjoy an expanded consumption availability set compared to what the country can command under autarky. With the increase in income, consumption demand shift from the primary to industrial luxury goods and therefore more of such goods will be produced within the economy. As a consequence, the distribution of income would change. The issue that we are concerned with in this paper is whether income distribution is converging or diverging. To the best of our knowledge, there has been limited empirical analysis

on the linkages between trade, structural transformation and income convergence. For instance, Sposi (2015), Betts et al. (2017) and Teignier (2018) have studied the role of international trade in structural transformation for South Korea during its growth miracle period and found that international trade accelerated the transition out of agriculture sector into industrial and services sector. Teignier (2018) argues, in addition, that international trade could have played an even larger role if South Korea had not simultaneously introduced agricultural protection policies. Another recent study by Sarma et al (2017) noted the that Viet Nam has experienced sustained and rapid economic growth since the *Doi Moi* economic reforms of 1986. The authors find that structural transformation occurred across all income quantiles, but the shift from agriculture to manufacturing was more prominent for those at the centre of the income distribution.

Unfortunately, there is a very scant literature dealing with how trade impacts income convergence by inducing structural transformation in a group of countries. In view of this lacuna, our study is chiefly motivated to fill this gap in literature. The objective of this paper is to study the role of trade in income convergence via its impact on structural transformation in the European Union (EU) and Association of Southeast Asian Nations (ASEAN). The motivation for this study stems from two compelling reasons. *Firstly*, all the earlier studies on income convergence in the EU (Armstrong, 1995; Ben-David, 1993, 2001; Dewhurst and Mutis-Gaitan, 1995; Leonardi 1995; Kutan and Yigit 2009; Boldrin and Canova, 2001; Barua et al 2006; Villaverde and Maza, 2008 etc.) and ASEAN (Jayanthakumaran and Lee, 2009, 2013; Sperlich and Sperlich, 2012; Mu Shun Wang, 2012; Solarin, 2014 etc.) are based on the traditional concepts of *beta* and *sigma* convergence (developed by Barro Sala-i-Martin, 1992) which in turn are based on the Solow – Swan model (1956). However, economic growth is an evolutionary process where an economy transforms from an agricultural specialization to industries to services and how such evolution contributes to income convergence is unexplained by the single sector growth model of Solow – Swan underlying the Barro Sala-i-Martin analysis of convergence. Hence, adopting the Barro Sala-i-Martin (1992) analysis of convergence will not be suitable for analyzing the underlying process of structural change that an economy experiences as the forces of trade get unfolded. In this study, the analysis of convergence in the EU and ASEAN is based on Theil index of inequality which provides a multi-sectoral analytical framework, allowing us to capture structural transformation of the economies. *Secondly*, thus far there hasn't been any comparative study on the link between trade, structural transformation and income convergence for the EU and the ASEAN. As these two

particular groups present a wide range of differences[1] in terms of time of formation and advancement, levels of development etc., they make interesting case for comparative study to understand whether countries at different stages of development and different levels of openness experience differently towards convergence. The time period of our study is 2000-2017, which is marked with unfolding of great economic dynamism in the EU as well as the ASEAN[2].

The paper is structured as follows. We provide extensive discussion on the methodology used in the study and the sources of data in Section II. Section III empirically examines the role of trade in structural transformation in the EU and the ASEAN, which is followed by comparative analysis of these two groups of countries in Section IV. Section V concludes the discussion.

II. Methodology and Data

A. Methodology

At the outset, we will first carry out a trend analysis of Theil indices of inequality with respect to income (GDP) and its sectoral components in order to gauge how the ASEAN and the EU economies have performed in terms of convergence during 2000-2017. This will be followed by the examination of the link between trade and income convergence via structural transformation. This involves two steps. The first is to examine which sectoral component of income has had the major contribution in determining the trend in overall income inequality in the region and the second is to determine whether trade has impacted the expansion of that particular sectoral share

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[1] EU is a customs union, while ASEAN is a free-trade zone. This means EU countries are all tied to each other – monetarily and financially- more intricately than the ASEAN nations. In terms of trade openness, ASEAN opened up to trade only in the 1990s, whereas EU has been open since the 1950s.

[2] The Maastricht Treaty (1993) was followed by the completion of the Single Market which implemented the "four freedoms"—of people, goods, services, and capital within EU, introduction of Euro as single official currency and inauguration of EU's monetary authority, European Central Bank in Germany. Post the Maastricht Treaty, the period 2000-2017 saw the biggest enlargement of EU to date, with now 28-member countries (starting with initial 6 founding members), with considerably less developed economies joining the EU. As far as ASEAN is concerned, data prior to 2000 will reflect confounding impact of trade and other factors of per capita income convergence as the impact of East Asian Crisis of 1997 will overshadow the impact of these factors considered for the study. After the East Asian Financial Crisis of 1997, a revival of the Malaysian proposal called for better integration of the economies of ASEAN. The full import of The ASEAN Free Trade Area, established on 28 January 1992, will be reflected in post 2000 data. Since 2007, ASEAN countries have gradually lowered their import duties to member nations. The target is zero import duties by 2016. The Jakarta Charter, 2008 aims at moving closer to "an EU-style community". The charter turned ASEAN into a legal entity and aimed to create a single free-trade area. Thus, the ASEAN and EU nations have witnessed major economic developments post 2000, making 2000-2017 an interesting period to attempt a comparative analysis.

of income in the low-income countries of the region. By implication, we can say that trade has impacted income convergence by propelling structural transformation in favour of the poorer countries in the region.

1. Theil Index of Inequality

Theil index of inequality in income[3], Ty, is defined as follows:

$$T_y = \sum y_i \log\left(\frac{y_i}{p_i}\right) \text{ --- (1);}$$

where *y* indicates income measured in terms of GDP. The subscript *i* stands for a country *'i'* in the region (EU or ASEAN, as the case may be). In the mathematical specification (1), p_i is country *i*'s share of population in total population of the region and y_i is country *i*'s share of income in the total income of the region.

The inequality measure takes non-negative values only. An equal distribution is denoted by $T_y=0$, which happens when every country's population and its share in income are equal. A rise in the value of T_y over time means that income inequality is rising over time. Thus, an extremely unequal distribution implies that $T_y= log(P/P_i)$ where a single country owns all income while all other countries have zero income. In the same way we can define the levels of inter-country inequality in the sectoral components of GDP (viz., agriculture, industry and services), by replacing the indicator 'y' by variables representing agriculture, industry and services. Decomposing outputs into three major sectors (agriculture, industry and services) will help us to examine the structural shift the economy experiences with rise in income and openness in trade.

2. Preliminary Investigation into the Relationship between Income Inequality and the Inequalities in its Sectoral Components

As a preliminary investigation into the relationship between income inequality and the inequalities in its various components (viz., share of agriculture in income, share of industry in income and share of services in income), a regression analysis is performed where Theil index of income inequality is regressed on the Theil inequalities in its components. Precisely, we do an Ordinary

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[3] The advantage of Theil measure of inequality over other measures of inequality, like Gini etc., is that it is independent of size-variations among regions as has been shown by Azad (1992). Also, Theil index of inequality can be decomposed into inequality within and between differently defined population subgroups.

Least Squares (OLS)[4] estimation of the following regression model for the EU and the ASEAN countries separately:

$$Income\ Theil\ Index_t = \beta_0 + \beta_1 Theil\ Index\ of\ Agriculture_t +$$
$$\beta_2 Theil\ Index\ of\ Industry_t + \beta_3 Theil\ Index\ of\ Services_t + \epsilon_t - - - (2);$$

ϵ_t is the error term which satisfies the assumptions of the OLS model.

3. Chenery Syrquin Equation for Structural Transformation

Next, in order to determine the structural change across the regions due to trade, we will estimate the following semi-log version of augmented Chenery-Syrquin model which also accounts for the non-linear income and size (population) effect:

$$X_{it} = \beta_0 + \beta_1(lnY_{it}) + \beta_2(lnY_{it})^2 + \beta_3(lnN_{it}) + \beta_4(lnN_{it})^2 + \beta_5 lnTRADE_{it} + \beta_6 PCD *$$
$$lnTRADE \text{-----}(3)$$

X is the dependent variable representing various sectoral shares (i.e., X represents the share of agriculture in GDP, share of industry in GDP and share of services in GDP; therefore, we estimate three regression equations), Y_{it} is per capita income (GDP) of country i at time t; N_{it} is the population of country i at time t; $lnTRADE_{it}$ is logarithm of total trade as percentage of GDP for country i at time t and PCD is "poor country" dummy variable[5]. PCD dummy for the EU and the ASEAN is constructed so that it takes value 1 for countries that have per capita income levels below the median[6] income level of the EU/ASEAN in the year 2000[7]. Thus, $PCD*lnTRADE$ is the interaction term in the regression model that captures the impact of trade openness on sectoral shares in low income countries of the EU and the ASEAN.

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[4] Our methodology is borrowed from Barua et al. (2010) who employ similar methodology for Indian economy.

[5] A similar exercise was done by Barua et al, 2010 in the Indian context. However, their definition of "poor/special state status dummy" differs from the way we define "poor country dummy" in the contexts of the EU and the ASEAN countries respectively. Barua et al. 2010 have defined "special state status" as representing Indian states where the Indian government provides economic incentives to encourage manufacturing orientation in the state.

[6] We are taking median instead of mean, because we are interested in the relative position of a country with respect to other countries in the group in term of per capita income. While median by definition represents the value posited in the middle of a series, mean is the average of all the values in the series. Thus, the median is more useful than the mean when there are extreme values in the data set as it is not affected by the extreme values. This is true for our case, as in both the EU and the ASEAN, some countries have extremely high values of per capita income and some countries have extremely low values of per capita income.

[7] In case of EU, PCD takes value '1' for Bulgaria, Romania, Latvia, Lithuania, Poland, Estonia, Slovak Republic, Hungary, Croatia, Czech Republic, Malta, Slovenia, Portugal, and Greece. In the case of ASEAN, PCD takes value '1' for Cambodia, Lao PDR, Myanmar and Vietnam.

The regression equation is purported to explain that the output share of each sector depends on per capita income as well as the size of the population and trade openness. The process of structural transformation encompasses a reciprocal relationship between increasing income and the change in the proportion of the supply and demand. While the per capita income variable captures the income effect of demand and the operation of Engel's law, the population size variable represents the extent of demand, which affects the size of production and economies of scale. From the results obtained by recent standard cross-country results in literature (Ho, 2015; Barua et al., 2015; Mensah et al., 2016; Kanbur et al., 2017 etc.), we expect that the coefficients of these variables will take positive values for share of industries and services, implying that as income rises the demand for industrial and services output will rise following Engel's law and therefore it leads to a rise in the share of these sectors in GDP. Similarly, as the size of the population increases, the scale of production also rises with associated effects on reduction of the cost of production. The latter effect also will have an upward thrust on the share of industries and services. Corollary to this, we expect that both the share of agriculture and population; and share of agriculture and income to be inversely related to each other.

According to Chenery (1979), such relationship between income and the proportion of supply and demand is impacted by overall macroeconomic policies as well as sector-specific policies. Although, Chenery (1979) didn't highlight that macroeconomic policy could also relate to trade policy, in our augmented Chenery-Syrquin model (3) we have included the trade variable as trade encourages high degree of specialization, expansion of market and allocation of economic activity across broad sectors across different countries of the regions. The presumption is that trade openness will allow resources to be shifted away from primary agricultural sector to the industrial enterprises and eventually to services sector, since the lower income countries have comparative advantage in relatively unskilled labour-intensive industries. However, this structural transformation may increase or decrease income inequality depending on whether the impact on sectoral shares is unevenly or evenly spread out across the countries of the EU and ASEAN which will be captured by the estimated coefficient on the interaction variable of poor country dummy, PCD and trade. The dummy variable, PCD can be interpreted as the variable capturing the structural orientation of poor countries of the region.

B. Data Source

Annual data, from 2000 to 2017, on all our variables of interest, viz., total population and gross domestic product (GDP),value added share of agriculture, industry and services in GDP and total trade which is expressed as the sum of exports and imports of goods and services measured as a share of gross domestic product, for all the countries of the EU and the ASEAN are taken from World Development Indicators (WDI) Database of World Bank.
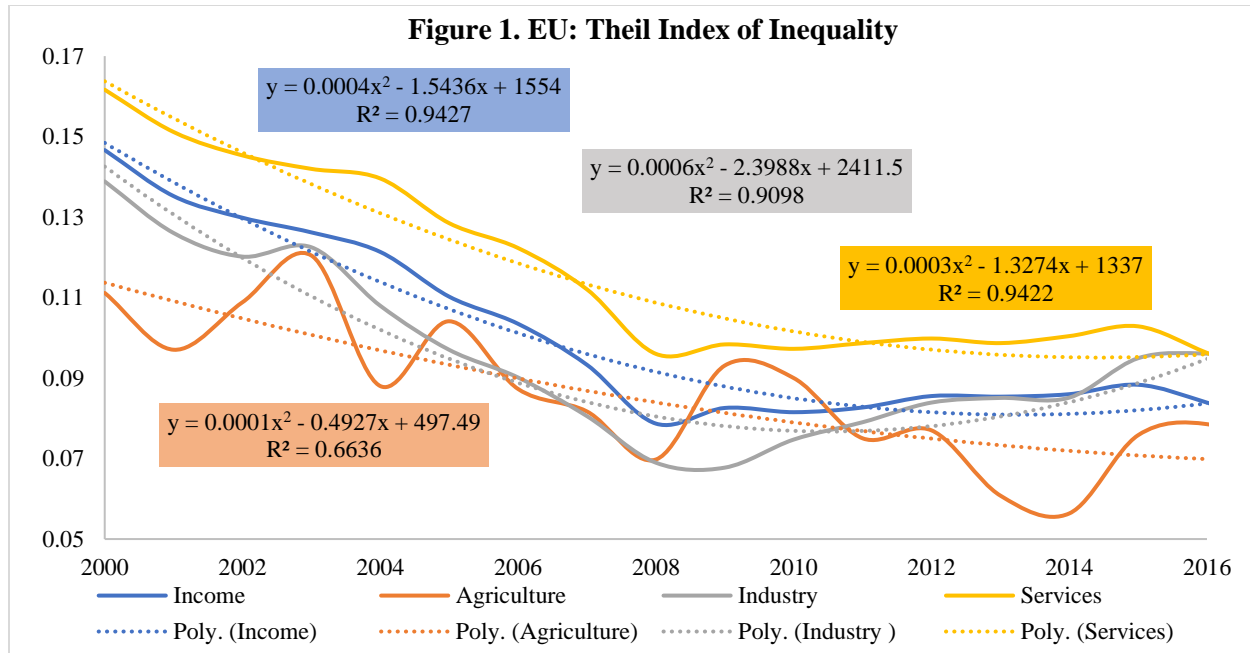
III. Empirical Results

A. EU

1. Trend Analysis of Theil Indices of Inequality

Figure 1 below presents Theil indices of inequality with respect to income and its sectoral components for the EU. We calculated average annual growth rates of inequality indices and we find negative trend for GDP and all its components- agriculture, industry and services and all the estimates are significant[8]. This suggest that inter-country inequality has come down in all the sectors of the economy. The average annual growth rate, particularly in case of industry, convince us that some measure of nonlinearity may exist in the behaviour of inequality over time and therefore non-linear polynomial trend is estimated for all Theil indices. It is found that the coefficient of time and its higher value up to second degree are significant (Figure 1). It can be concluded from the polynomial trend that inter country inequality across the EU nations with respect to income and its sectoral components that even though inequalities are on declining trend, with progressing years, there is tendency of inequality to rise.

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[8] See Appendix 1

Figure 1. EU: Theil Index of Inequality

$y = 0.0004x^2 - 1.5436x + 1554$
$R^2 = 0.9427$

$y = 0.0006x^2 - 2.3988x + 2411.5$
$R^2 = 0.9098$

$y = 0.0003x^2 - 1.3274x + 1337$
$R^2 = 0.9422$

$y = 0.0001x^2 - 0.4927x + 497.49$
$R^2 = 0.6636$

Source: Author's calculation using World Development Indicator, World Bank Database

2. Relationship between Theil Index of Inequalities of Income and its Sectoral Components

Model (2) is based on time series data on Theil indices of inequalities with respect to income, value added of agricultural, value added of industry and value added of services. Unlike cross sectional data, time series data cannot be considered to be randomly sampled, therefore, each observation cannot be assumed to be identically and independently distributed (i.i.d.). Also, the error terms may be correlated over time, which is the violation of one of the basic assumptions of OLS estimation. Other important assumptions of OLS estimation are – error terms should be homoscedastic and there should be no multicollinearity. We performed the White test to detect the presence of heteroscdasticity of the error terms. The p-value of the White test is 0.408 which means that the null hypothesis of constant variance of error term cannot be rejected which indicates absence of heteroskedasticity in our data. Durbin-Watson test for autocorrelation shows the presence of autocorrelation in our data[9]. Further, we calculate VIF which is found to be 5.5, thus even though multicollinearity is present in our data, it is unlikely to be an issue in our estimation.

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[9] Durbin-Watson d-statistic (4, 18) = 2.4348. This value is greater than $d_U = 1.604$ at 1 per cent level of significance.

In order to correct for heteroscedasticity and autocorrelation in our data, we estimate the model (2) corrected with Newey-West estimator which can be used to improve OLS when the residuals are heteroskedastic and/or autocorrelated. The regression results are reported in Table 1 below.

Table 1: Regression Results of Income Inequality: EU

Theil Index of Income	Coefficient
Theil Index of Agriculture	**-0.043**
	(0.105)
Theil Index of Industry	**0.338****
	(0.148)
Theil Index of Services	**0.762*****
	(0.191)
Constant	**-0.016*****
	(0.005)
Number of Observations	18
Test for overall significance of the model	F (3,14) = 306.74
(H0: All slope coefficients are zero)	Prob. >F = 0.00

Newey West standard errors in parenthesis. ***significant at 1% level of significance. **significant at 5% level of significance

The regression results for the EU (Table 1) unequivocally show that Theil index of income inequality move in the same direction as the Theil indices of inequalities with respect to industry and services, as the estimated coefficients of these indices are significant and take positive signs. This means that a decline in inequality in any of these two sectoral components of income will feed into the decline in overall income inequality. However, inequality in agriculture has a dampening effect on Theil index of income inequality, though it is not significant. Thus, reduction in inequality in the industrial sector and services sector have significantly led to the reduction in inequality in income.

3. Estimation of Augmented Chenery Syrquin Model

Closed Economy Framework

We have a strongly balanced short panel data. With the pooled sample, we estimate the model in the closed economy set up by both the techniques of fixed effect (FE) model and random effect (RE) model which is followed by the Hausman test to find the desirability of the model. The Hausman test favours RE estimation over FE specification for models pertaining to share of industry and services; and it favours FE estimation over RE estimation for model pertaining to share of agriculture. But we have considered the results of RE estimation for our analysis for all sectoral shares because FEM eliminates the effects of omitted heterogeneity leading to the FE loss of valuable information stemming from the variation between individuals. This results in higher standard errors and thus imprecise parameter estimates (Durlauf et al 2005). In our case, the dependent variables (the sectoral shares of GDP) and all the explanatory variables included in our study exhibit greater between-country variations than within-country variations[10], indicating that a significant amount of valuable information would be lost if FE specification model is adopted. In such cases, it is better to draw analysis hinged on the estimations obtained from RE specification.

In case of all the three panel regression models with share of agriculture, industry and services as dependent variable, Wald test for group-wise heteroscedasticity gave p-value =0.00 indicating that the error variance varies across countries, meaning error terms for all these three models are heteroscedastic. In addition, Wooldridge test for autocorrelation yielded p-value = 0.00 for our panel data, for all the three models with three sectoral shares, implying presence of first order autocorrelation. As panel diagnostic tests indicate that error terms in our model are heteroscedastic and autocorrelated that need to be addressed before estimation. Since regression models pertaining to all sectoral shares of income are infested both by heteroscedasticity and autocorrelation, and the form of heteroscedasticity is unknown, the estimation is done using Feasible Generalized Least Squares (FGLS) method. The results of RE estimations, corrected for autocorrelation and heteroscedasticity are presented in Table 2.
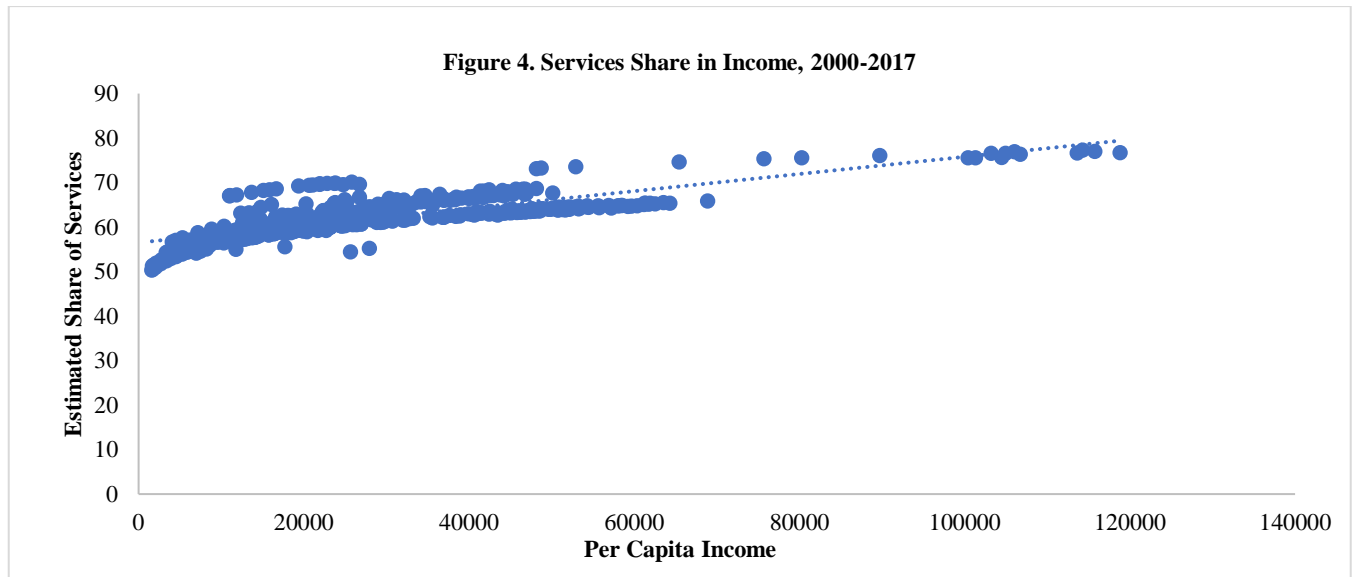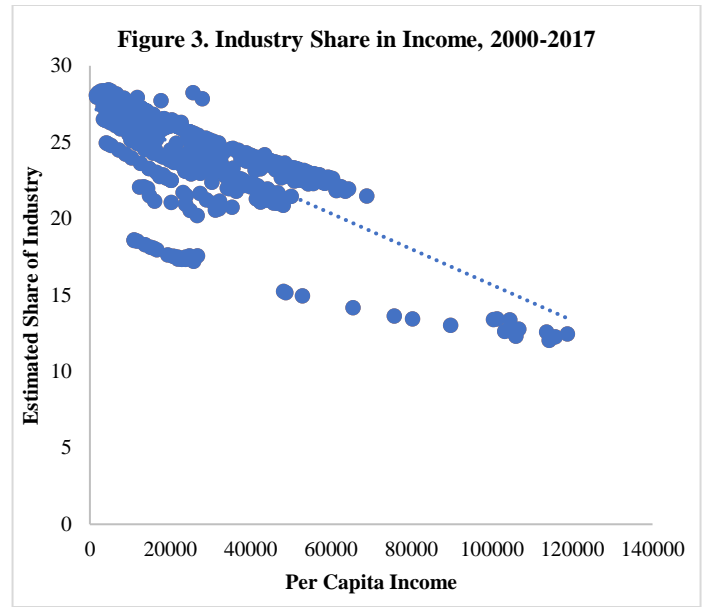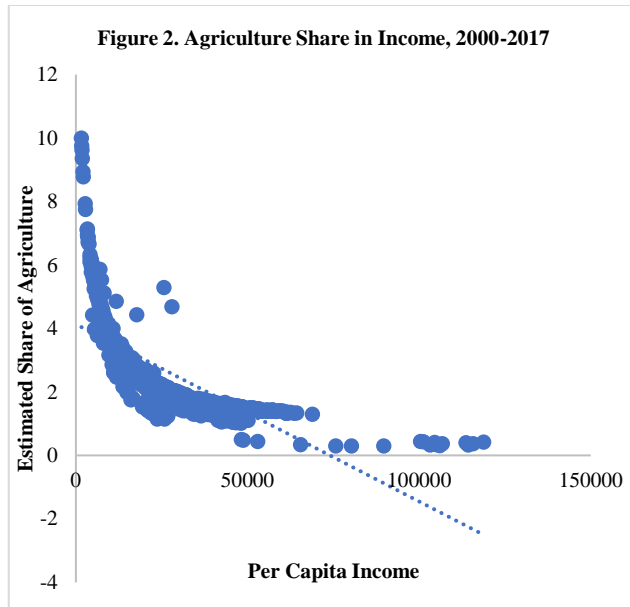
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[10] See Appendix 2

Table 2. Structural Change Equation for EU in Closed- Economy Framework

	Dependent Variable		
	Share of Agriculture	Share of Industry	Share of Services
lnY	-11.921***	11.109**	-3.168
	(0.845)	(4.642)	(4.472)
(lnY)²	0.519***	-0.687***	0.389*
	(0.043)	(0.238)	(0.229)
ln P	3.589***	24.543***	-33.812***
	(0.515)	(2.829)	(2.725)
(lnP)²	-0.112***	-0.752***	1.056***
	(0.016)	(0.090)	(0.087)
Constant	40.929***	-216.689***	323.077***
	(5.677)	(31.182)	(30.039)
N	504	504	504
Test for overall significance of the model (H0: All Slope Coefficients are zero)	Wald chi2(4) = 1764.06	Wald chi2(4) = 234.48	Wald chi2(4) = 599.33
	Prob > chi2= 0.00	Prob > chi2= 0.00	Prob > chi2= 0.00

***Significant at 1%, **Significant at 5%., *Significant at 10% Figures in parentheses represent the standard errors.

As can be inferred from the results of Table 2, we notice that while the share of agriculture is significantly negatively related to per capita income and significantly positively related to square of per capita income, the share of industries is significantly positively related to per capita income and significantly negatively related to square of per capita income. The share of services is negatively related to per capita income and positively related to square of per capita income; however, only the coefficient of the latter variable is significant. The population variable is highly significant in explaining variations in all the sectoral shares of income, supporting the operation of economies of scale in structural transformation.

Now we plot the graphs depicting the relationship between per capita income and its sectoral shares. The graphs of estimated values of sectoral shares against per capita income are given in figures 2, 3 and 4 respectively.

Figure 2. Agriculture Share in Income, 2000-2017

Figure 3. Industry Share in Income, 2000-2017

Figure 4. Services Share in Income, 2000-2017

We draw the following observations from the above figures. Firstly, we see that the shares of agriculture and industries have declined over time and over higher per capita income countries in the EU. The relationship between estimated shares of agriculture and industry and per capita income are depicted by negatively sloped curves indicating that low-income countries are characterized by greater agriculture and industrial orientation. The slope in figure 2 is steeper as compared to that in figure 3, which implies that the decline in share of agriculture (agricultural orientation) over higher income countries is greater than that in share of industries. Secondly, the services orientation has increased for countries with higher per capita income. Thus, our results

validate the process of structural transformation in the EU and are consistent with standard cross-country results.

Open-Economy Framework

We now turn to the effects of trade openness on structural orientation across the countries of the EU and the efficacy of trade in bridging the gap in structural transformation between the higher income and the lower income countries. We re-estimate Chenery-Syrquin model incorporating the trade and the interaction variables as explanatory factors.

Although the Hausman test indicates that FE specification is better fit to our panel data, we have chosen RE specification over FE because our dependent and all the explanatory variables exhibit greater between-country variations than within-country variations, indicating that a significant amount of valuable information would be lost if FE specification model is adopted. Panel diagnostic tests indicate that error terms in our model are heteroscedastic and autocorrelated all the three models with three sectoral shares that need to be addressed before estimation. Since the form of heteroscedasticity is unknown, the estimation is done using FGLS method. The estimation results for the models for the sectoral shares, corrected for autocorrelation and heteroskedasticity is reported in Table 3.

Table 3. Structural Change Equation for EU in Open-Economy Framework

	Dependent Variable		
	Share of Agriculture	Share of Industry	Share of Services
lnY	- 12.709***	22.040***	-13.578***
	(0.929)	(3.065)	(3.256)
(lnY)²	0.565***	-1.240***	0.868***
	(0.049)	(0.165)	(0.175)
ln P	3.252***	6.184***	-7.654
	(0.509)	(9.720)	(10.004)
(lnP)²	-0.106***	-0.180***	0.242
	(0.016)	(0.312)	(0.321)
lnTRADE	-0.607***	-2.220**	1.981**
	(0.130)	(0.905)	(0.958)
lnTRADE*PCD	0.022	0.577*	-1.089***
	(0.031)	(0.319)	(0.331)
Constant	50.722***	-115.12	163.879**
	(6.156)	(78.396)	(80.829)
N	504	504	504
Test for overall significance of the model	Wald chi2(6) =1865.75	Wald chi2(6) = 129.37	Wald chi2(6) = 201.79
H₀: All slope coefficients are zero	Prob > chi2=0.00	Prob > chi2=0.00	Prob > chi2=0.00

***Significant at 1%, **Significant at 5%, *Significant at 10%. Figures in parentheses are the standard errors.

The results given in Table 3 clearly show that trade has significantly impacted all the sectoral shares of the EU economy (while the estimated coefficient of *lnTRADE* is significant at 1 per cent level of significance for the shares of agriculture, it is significant at 5 per cent level of significance for the share of industries and services). On the one hand, trade has significant effect on increasing the shares of services and on the other hand it has a significant effect on lowering the shares of agriculture and industries in the overall per capita income of the EU. Also, trade impacts agricultural orientation equally for high- and low-income countries of the EU (as the estimated coefficient for interaction variable for share of agriculture is insignificant). The decline in share of industries due to trade is greater for higher income countries as compared to that of lower income countries in the EU; the trade elasticity of share of industries is -2.22 while that for low income countries is -1.643. Simultaneously, the lower income countries in EU seem to have significantly gained in shares of services, however, the gain in share of services for low-income countries is lesser as compared to gain in share of services by high income countries.

In addition, our findings regarding the relationship of sectoral shares with per capita income and population remains the same as presented in Table 2; only that the income and population variable is rendered insignificant in explaining services shares with the inclusion of trade variable.
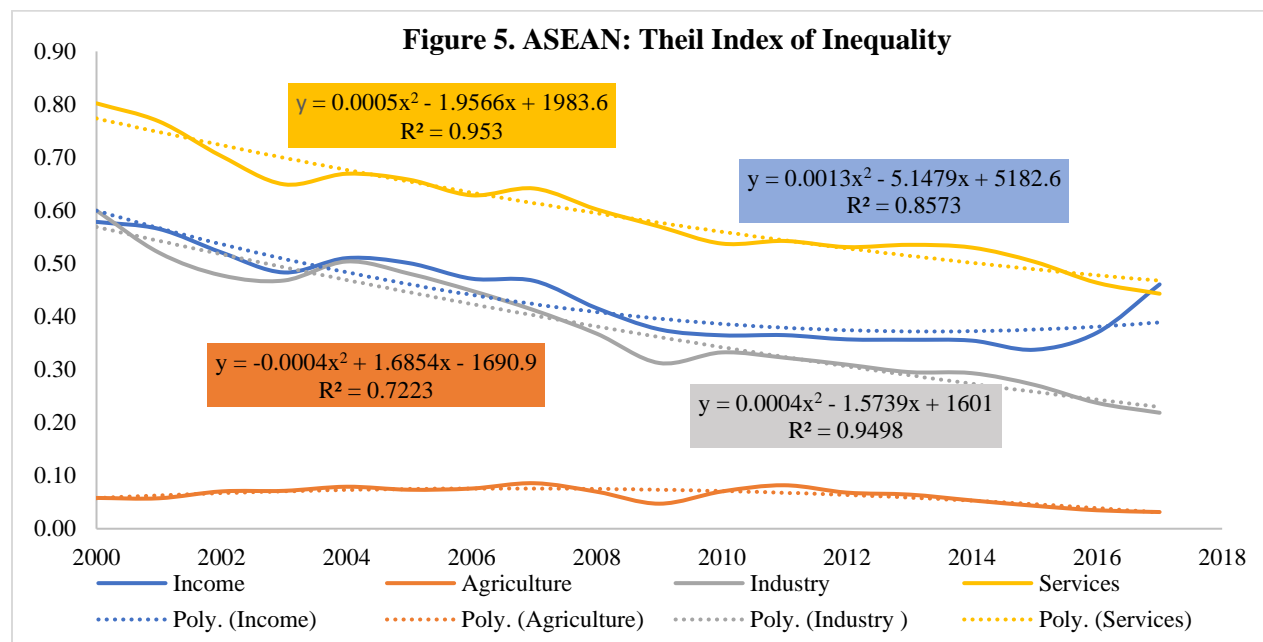
B. ASEAN

1. Trend Analysis of Theil Indices of Inequality

Figure 5 below presents Theil indices of inequality with respect to income and its sectoral components. It can be seen that, during 2000-2017, the levels of inequality are the lowest for agriculture followed by that for industry and income; the levels of inter-country inequality are the highest for services. The inter-country inequality for industry and income move almost in the same till 2015, post which, the direction in these two inequalities diverged. We calculated average annual growth rates of inequality indices and we find negative trend for GDP and all its components- agriculture, industry and services and all the estimates are significant[11]. This suggest that inter-country inequality has come down in all the sectors of the economy. The average annual growth rate, particularly in case of income and agriculture, convince us that some measure of nonlinearity may exist in the behaviour of inequality over time and therefore non-linear polynomial

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[11] See Appendix 3

trend is estimated for all Theil indices. It is found that the coefficient of time and its higher value up to second degree are significant (Figure 5).

Figure 5. ASEAN: Theil Index of Inequality

$y = 0.0005x^2 - 1.9566x + 1983.6$
$R^2 = 0.953$

$y = 0.0013x^2 - 5.1479x + 5182.6$
$R^2 = 0.8573$

$y = -0.0004x^2 + 1.6854x - 1690.9$
$R^2 = 0.7223$

$y = 0.0004x^2 - 1.5739x + 1601$
$R^2 = 0.9498$

Source: Author's calculation using World Development Indicators, World Bank Database

It can be concluded from the polynomial trend of income inequality that income inequality across the ASEAN nations showed a declining trend till 2015, after which the income inequality across ASEAN nations seems to have widened. Non linearity analysis also shows that perhaps the inequality in agriculture and services has declined during the later period after initially witnessing rise in the earlier periods (perhaps till 2014).

2. Relationship between Theil Index of Inequalities of Income and its Sectoral Components

As the regression model (2) is time series in nature, it is apposite to carry out diagnostic checks before the estimation. We performed the White test to detect the presence of heteroscedasticity of the error terms. The p-value of the White test is 0.2189 which means that heteroskedasticity is not a problem in our data. Durbin-Watson test for autocorrelation shows the absence of autocorrelation in our data[12]. Further, we calculate VIF which is found to be as high as 14.5 indicating the presence

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[12] Durbin-Watson d-statistic (4, 18) = 1.215072. This value lies in the range of d_L and d_U, i.e., between 0.614 and 1.604 at 1 per cent level of significance.

of multicollinearity in our model. Now, the problem of multicollinearity is a matter of degree and its severity cannot be quantified. Whether multicollinearity will be problem for our estimation or not will be reflected in estimation results. As the conditions of homoscedasticity and no autocorrelation are satisfied, we conduct OLS regression estimation the results of which are presented in Table 4. According to Table 4, estimated coefficients of Theil indices of agriculture and industry are significant, so is the overall F-statistic. So, we can say that even though multicollinearity is present in our data, we can draw reliable results from the obtained unbiased estimates[13].

Table 4. Regression Results of Income Inequality: ASEAN

Theil Index of Income	Coefficient
Theil Index of Agriculture	**-1.3539***
	(0.6445)
Theil Index of Industry	**0.7860***
	(0.3825)
Theil Index of Services	-0.0435
	(0.4059)
Constant	**0.2483***
	(0.1150)
Number of Observations	18
Test for overall significance of the model	F (2,14) =24.31
(H0: All slope coefficients are zero)	Prob > F =0.0000

Standard errors in parenthesis. *significant at 10% level of significance.

In the case of the ASEAN, the regression results (Table 4) clearly show that a decline in Theil index of inequality in industry positively contributed to the decline in income inequality; its

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[13] To check further on the consequence of multicollinearity on our estimations, we have tried a different specification by dropping the variable, Theil index of services. We didn't find any innocuous changes in result. The signs of estimated coefficients for Theil indices of agriculture and industry remain intact.

coefficients being significant and positive. Also, inequality in agriculture has a significant dampening impact on income inequality. The coefficients for Theil index of services is not significant.

3. Estimation of Augmented Chenery Syrquin Model

Closed Economy Framework

Here, we have strongly balanced long panel data. When the panel has few cross -sectional entities (country in this case) relative to number of time entity (year in this case), the individual country effects can be incorporated as explanatory dummy variables, leading to too many time (year) effects. Rather than trying to control for these, it is better to take advantage of the natural ordering of year as opposed to countries. Panel feasible generalised least squares (PFGLS) method for long panels allow for the error terms in the model to be auto-correlated and heteroscedastic. The results PFGLS method are presented in Table 5.
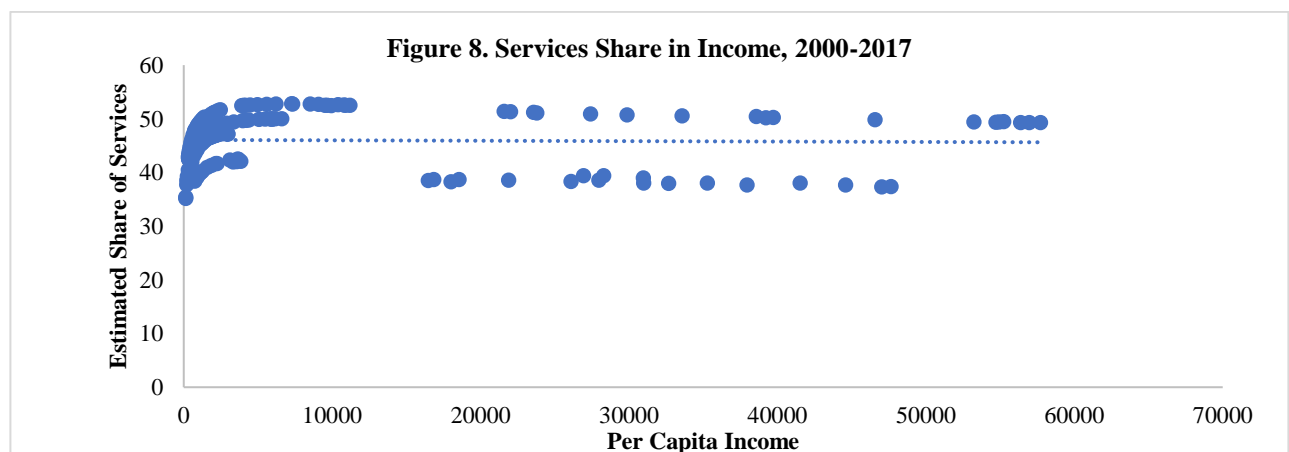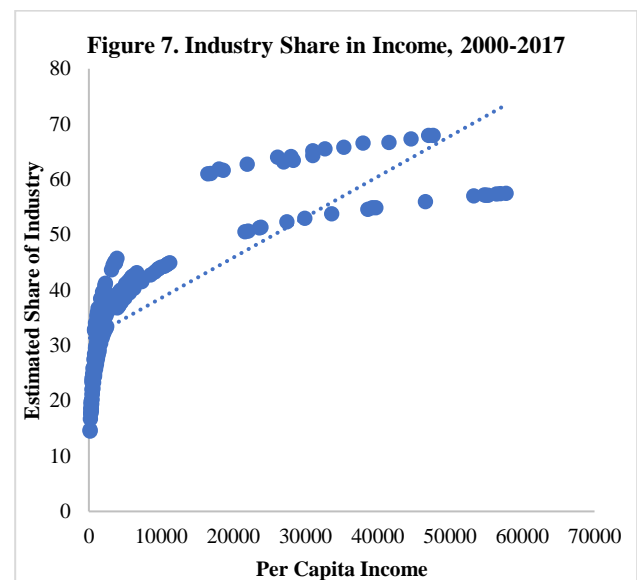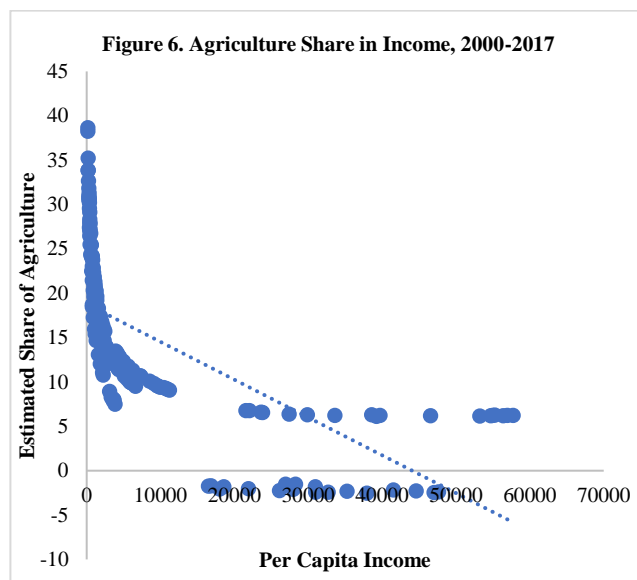
Table 5. Structural Change Equation for ASEAN in Closed Economy Framework

	Dependent Variable		
	Share of Agriculture	**Share of Industry**	**Share of Services**
lnY	-19.333***	6.013***	17.433***
	(0.913)	(1.740)	(1.955)
(lnY)²	0.874***	0.080	-0.964***
	(0.046)	(0.135)	(0.131)
ln P	24.143***	-34.235***	37.250***
	(2.236)	(7.475)	(5.448)
(lnP)²	-0.733***	1.045***	-1.142***
	(0.070)	(0.237)	(0.164)
Constant	-85.011***	261.670***	-329.054***
	(19.561)	(56.254)	(46.151)
N	180	180	180
Test for overall significance of the model H₀: All slope coefficients are zero	Wald chi2(4) =1770.05 Prob > chi2= 0.00	Wald chi2(4) =1969.82 Prob > chi2= 0.00	Wald chi2(4) =183.03 Prob > chi2= 0.00

***Significant at 1%. Figures in parenthesis are standard errors.

From Table 5 we observe that while the share of agriculture is significantly negatively related to per capita income and significantly positively related to square of per capita income, the share of services is significantly positively related to per capita income and significantly negatively related to square of per capita income. The share of industries is positively related to both per capita income and square of per capita income; the coefficients being highly significant. The population variable is highly significant in explaining the shares of agriculture, services and industry, supporting the operation of economies of scale in structural transformation in the ASEAN.

Next, we plot the graphs depicting the relationship between shares of agriculture, industry and services and per capita income. The graphs of estimated values of sectoral shares against per capita income are given in figures 6, 7 and 8 respectively.

Figure 6. Agriculture Share in Income, 2000-2017

Figure 7. Industry Share in Income, 2000-2017

Figure 8. Services Share in Income, 2000-2017

Following observations are drawn from the above figures. First, the share of agriculture has declined over time and over higher per capita income countries in the ASEAN. Second, the industrial and services orientation have increased for countries with higher per capita income. The slope in figure 7 is steeper while that in figure 8 is relatively flatter, which implies that the rise in share of industries (industrial orientation) over higher income countries is much greater than that in share of services. Thus, our results validate the process of structural transformation in the ASEAN and are consistent with standard cross-country results. Also, lower income countries displayed having higher orientation of agricultural and industrial sector and lower orientation of services sector as compared to high income countries.

Open-Economy Framework

We now turn to the effects of trade openness on structural orientation across the countries of the ASEAN and the efficacy of trade in bridging gap in structural transformation between the higher income and the lower income countries. Now we estimate augmented Chenery Syrquin model for ASEAN incorporating the trade and the interaction variables as explanatory variables.

Table 6. Structural Change Equation for ASEAN in Open Economy Framework

	Dependent Variable		
	Share of Agriculture	**Share of Industry**	**Share of Services**
lnY	-25.938***	2.877	22.089***
	(1.484)	(2.568)	(1.799)
(lnY)²	1.347***	0.115	-1.358***
	(0.082)	(0.185)	(0.130)
ln P	38.030***	-59.120***	40.011***
	(3.718)	(7.521)	(2.941)
(lnP)²	-1.181***	1.831***	-1.244***
	(0.120)	(0.237)	(0.087)
lnTRADE	-3.001***	1.139***	1.964***
	(0.235)	(0. 221)	(0.260)
lnTRADE* PCD	1.217	-0. 616***	-1.914***
	(0.205)	(0.210)	(0.246)
Constant	-155.344***	472.777***	-364.750***
	(30.551)	(56.742)	(24.244)
N	180	180	180
Test for overall significance of the model	Wald chi2(6) = 3351.68	Wald chi2(6) =749.36	Wald chi2(6) = 561.98
H₀: All slope coefficients are zero	Prob > chi2 = 0.00	Prob > chi2 = 0.00	Prob > chi2 = 0.00

***Significant at 1%. Figures in parentheses are standard errors.

From Table 6, we note that the share of trade has significant effect on shares of agriculture, industry and services; trade has negative impact effect on agricultural share of the ASEAN, it has positive

impact on industrial and services sector. It can also be inferred from the table that the overall agricultural orientation of the ASEAN has declined significantly due to trade openness, with magnitude of decline being greater for higher income countries of the ASEAN (as trade elasticity for high income countries is -3.001 and that for low income countries is -1.784). Also, the lower income countries in the ASEAN seem to have gained in both the shares of industry and services due to trade, however, the gain in share of these two sectors for low-income countries is lesser as compared to that for high income countries. This is because trade elasticity for industry- orientation for lower income countries is placed at 0.523 while that for higher income countries is placed at 1.139; and trade elasticity for services orientation for lower income countries is placed at 0.05 while that for higher income countries is placed at 1.964. This explains that poorer countries in the ASEAN have significantly gained in terms of both services and industrial orientation as a result of trade, though the relative gain is still less as compared to that by the high-income countries. Since income of the poor countries in the ASEAN were much lower than the richer countries, the increased orientation in industries and services were not as large. Thus, trade has triggered the process of income convergence among the ASEAN nations by fuelling the growth of industrial and services sector among the low-income countries, even though the process of convergence is not complete as the gains accrued to low income countries due to trade is still falling short as compared to that accrued to high income countries of the ASEAN. In addition, our findings regarding the relationship of sectoral shares with per capita income and population remains the same as presented in Table 5. It can also be noted that while income has expected impact on the sectoral share; population has a negative impact on industry share in ASEAN which could be due to disproportionate expansion of working age population and population majorly being dependent population.

IV. Structural Transformation in the EU and the ASEAN: A Comparison

Regional integration has been a major research topic over the last two decades. The initial focus was on the assessment of the monetary policy and currency integration potential of the EU, later the research area further extends to cover the assessment of the success of the EU as well as the investigation of the integration potential of other regions like the East Asia, ASEAN, the South

Mediterranean countries, the East African Community (EAC) etc. Among these regions, economists such as Bayoumi and Eichengreen (1997) suggest that ASEAN as one of the highly credible candidates for a currency union after EU, although significant differences exist in the integration process between the EU and East Asia (Capannelli and Filippini, 2010). To emphasize, by establishing a single market and production base, the ASEAN Economic Community (AEC) aims at EU-style deeper and broader economic integration between ASEAN member countries. It is in this context; we have embarked on a comparative analysis of per capita income convergence in the EU and the ASEAN. In this section, we provide some broad comparative inferences on the role of trade on income convergence via its impact on structural transformation of the EU and the ASEAN.

While the expansion of the EU from 6 founding members to 28 members has significantly increased the EU's diversity, the region still remains dominated by the developed countries and symmetric in comparison to ASEAN, which features developed countries, middle-income developing countries and least-developed countries. This is well reflected by Theil indices of income inequality calculated for the EU and the ASEAN; income Theil indices for the EU is lower than those of the ASEAN in all the years during 2000-2017. A linear declining trend in the Theil index of inequality with respect to income and its sectoral components during 2000-2017 indicate that both the EU and ASEAN have witnessed a process of income convergence as well as convergence in economic structure, however income convergence process doesn't seem to be sustainable as polynomial trend analysis indicate a rise in inequality with progress of time (especially after 2015).

Our empirical on structural orientation of the EU and the ASEAN affirms while in the EU, reduction in inequality with respect to income was mainly due to lowering of inequality with respect to industries services; in the ASEAN, lowering of income inequality was due to reduction in inequality with respect to industry. Inequality in agriculture has a significant dampening impact on income inequality in the ASEAN. Also, we have been able to shown that the ASEAN economy as a whole is swiftly shifting from agricultural sector to industrial sector due to trade. And the economy of EU as whole, which is already characterized by very little share agriculture, is moving from industrial sector to services sector owing to trade.

In both the EU and the ASEAN, trade has accentuated the structural change process. In the case of the EU, trade had positive and significant impact in increasing the share of services and significant impact in lowering the share of agriculture and industries. Also, poor countries seem to have gained in the share of both industry and services, however, the gain in share of services for low-income countries is lesser as compared to gain in share of services by high income countries. In case of the ASEAN, trade has positively contributed in increasing the shares of industries and services and reducing the share of agriculture. Nevertheless, the gain in shares of services and industrial sectors for low-income countries is lesser as compared to that for high income countries.

V.   Concluding Remarks

In conclusion, we can summarize our main results. First, trade has remarkably facilitated in speeding up the structural transformation for both the EU and the ASEAN economies. Second, we have observed that both the two blocks of countries experience convergence in per capita income during the period of our study, i.e., 2000-2017. Nevertheless, polynomial trend analysis indicate that the convergence process may not have been sustainable over the later period, especially for the ASEAN. Thirdly, trade has enhanced service-orientation in the EU and has brought down the income shares of agriculture and industries. Also, the poor countries within the EU seem to have gained in the share of both industry and services, although the gain in share of services is lesser as compared to the gain in share of services of the high-income countries in the EU. Fourthly, in case of the ASEAN, trade has led to increase in the shares of industries and services in income and has reduced the share of agriculture in total income. Although the lower income countries within the ASEAN have gained in terms of shares of services and industrial orientation, the gains are not substantial to sustain the process of income convergence in the ASEAN. In the case of the EU, income convergence has been mainly due to bridging of gap in industrial orientation between the low-income and the high income- countries within the EU.

References

Armstrong, H.W. (1995), 'Convergence among Regions of the European Union 1950-1990', *Papers in Regional Science 74, 125-142*

Azad, N.A. (1992), 'Trade Performance and Trade Distribution: A Study of North vs. South', *Ph.D. Dissertation, Jawaharlal Nehru University, New Delhi*

Barro, R.J. and X. Sala-i-Martin. (1992), 'Convergence', *Journal of Political Economy, 100: 223-251*

Barua, A, Sauernheimer, K and Mohr, T. (2006), 'Globalization, Unification and Income Inequality in Europe: Some New Empirical Evidence', https://faculty.washington.edu/karyiu/confer/GJ06/papers/barua.pdf

Barua, A and Chakraborty, P. (2010), 'Does Openness Affect Regional Inequality? A Case Study for India', *Review of development Economics, Vol 14, Issue 3: 447-465*

Barua, A. and Sawhney, A. (2010), 'Structural Change, Economic Growth and Trade: Case for Regional Reallocation of Investment in India', *CITD Discussion Paper 10-06, JNU*

Barua, A. and Sawhney, A. (2015), 'Development Policy Implications for Growth and Regional Inequality in a Small Open Economy: The Indian Case', *Review of Development Economics, 19(3), 695-709*

Ben-David, D. (1993), 'Equalizing exchange: Trade Liberalization and Income Convergence', *Quarterly Journal of Economics 108(3)*

Ben-David, D. (2001), 'Trade Liberalization and Income Convergence: A Comment', *Journal of International Economics, Elsevier, vol. 55(1), pages 229-234*

Betts, C.M., G. R. and R. Verma (2017), 'Trade, Reform, and Structural Transformation in South Korea', *IMF Economic Review, Vol. 65, Issue 4*

Boldrin, M. and Canova, F. (2001), 'Inequality and Convergence in Europe's Regions: Reconsidering European Regional Policies', *Economic Policy, April 2001*

Capannelli, G. and Filippini, C. (2010), 'Economic Integration in East Asia and Europe: Lessons from a Comparative Analysis', *The Singapore Economic Review (SER), 2010*

Caselli, F., and J. Coleman (2001), 'The U.S. Structural Transformation and Regional Convergence: A Reinterpretation', *Journal of Political Economy, 109(3), 584.616*

Chenery, Hollis B (1960), 'Patterns of Industrial Growth', *American Economic Review, 1960, 50, 624–653*

Chenery, H.B. and Lance, T. (1968), 'Development Patterns: Among Countries and over Time', *Review of Economics and Statistics, 50(4): 391– 416*

Chenery, H.B. and Syrquin, M. (1975), 'Patterns of Development, 1950-1970', *New York: World Bank and Oxford University Press*

Clark, C. (1940), 'The Conditions of Economic Progress', *Revised and reprinted in 1951, London: Macmillan*

Coleman, Wilbur John II. (2007), 'Accommodating Emerging Giants', *Manuscript, Duke University*

Deardorff, A. and J. Park (2010), 'A Story of Trade-induced Industrialization', *International Economic Journal 24 (3), 283–296*

Dewhurst, J. H. and H. Mutis-Gaitan. (1995), 'Varying Speeds of Regional GDP Per Capita Convergence in the European Union, 1981-91', *Pp. 22-39 in H. W. Armstrong and R. W. Vickerman, Eds. Convergence and Divergence among European Regions. London: Pion*

Douglass C. North, 'The Economic Growth of the United States', *1790-1860. Pp. xv, 304. Englewood Cliffs, N. J.: Prentice-Hall, 196*

Duarte, Margarida and Restuccia, Diego (2010), 'The Role of the Structural Transformation in Aggregate Productivity', *The Quarterly Journal of Economics Vol. 125, No. 1 (Feb., 2010), pp. 129-173*

Durlauf, S.N., Johnson, P., and Temple, J. (2005), 'Growth Econometrics', *in Handbook of Economic Growth, P. Aghion and S.N. Durlauf, eds., North Holland, Amsterdam*

Fisher, A.G.B. (1939), 'Production: Primary, Secondary and Tertiary', *The Economic Journal, 15(1): 24-38*

Hnatkovskay, V. and Lahiri, A. (2014), 'Structural Transformation and the Rural-Urban Divide', *2014 Meeting Papers 746, Society for Economic Dynamics*

Ho, C.P. (2015), 'Population Growth and Structural Transformation', *MPRA Paper, 73860*

Jayanthakumaran, K. and Lee, S-W. (2009), 'Multilateralism, regionalism and income convergence: ASEAN and SAARC', *in K. Jayanthakumaran (Eds.), Advanced Technologies (pp. 1-18), India: In-Tech*

Kanbur, R. (2017), 'Structural Transformation and Income Distribution: Kuznets and Beyond', *IZA Discussion Paper 10636, Institute for Study of Labour (IZA)*

Kim, S. (1998), 'Economic Integration and Convergence: U.S. Regions, 1840– 1987', *Journal of Economic History 58: 659–83*

Kutan, A. and Yigit, T. (2009), 'European Integration, Productivity Growth and Real Convergence: Evidence from the New Member States', *Economic Systems, Vol. 33, Issue 2*

Kuznets, S. (1966), 'Modern Economic Growth: Rate, Structure and Spread', *New Delhi: Oxford and IBH Publishing Co*

Kuznets, S., Miller, R. and Easterlin, R.A. (1960), 'Analyses of Economic Change', *Vol. 2 of Population Redistribution and Economic Growth, United States, 1870–1950. Philadelphia: American Philosophical Soc., 1960*

Leonardi, Robert. (1995), 'Convergence, Cohesion, and Integration in the European Union.', *New York: St. Martin's Press*

Lewis, W. A. (1954), 'Economic Development with Unlimited Supplies of Labour', *The Manchester School, vol. 22, no. 2, pp. 139-191*

Matsuyama, Kiminori (1992), 'A Simple Model of Sectoral Adjustment', *Review of Economic Studies, 59, 375–388*

Matsuyama, Kiminori (2009), 'Structural Change in an Interdependent World: A Global View of Manufacturing Decline', *Journal of the European Economic Association, 7 (2-3), 478–486*

Mensah, J.T. Adu, G., Amoah, A., Abrokwa, K. and Adu, J. (2016), 'What Drives Structural Transformation in Sub-Saharan Africa?' *African Development Review, Vol. 28, Issue 2*

Mu Shun Wang (2012), 'Income Convergence within ASEAN, ASEAN +3: A Panel Unit Root Approach', *Journal of Applied Economic Letters, Vol. 19, 2012*

Sarma, V., Paul, S. and Wan, G. (2017), 'Structural Transformation, Growth, and Inequality: Evidence from Vietnam', *ADBI Working Paper Series, No.681*

Solarin, S.A., Ahmed, E.M. and Dahalan, J. (2014), 'Income Convergence Dynamics in ASEAN and SAARC Blocs', *New Zealand Economics Papers, Vol. 48, 2014*

Solow, R.M. (1956), 'A Contribution to the Theory of Economic Growth', *Quarterly Journal of Economics 70: 65-94*

Sperlich, S and Sperlich, Y. (2012), 'Income Development and Sigma convergence in South–South Agreement Areas', *http://dx.doi.org/10.2139/ssrn.2001542*

Sposi, M. (2015), 'Evolving Comparative Advantage, Structural Change, and the Composition of Trade', *Globalization Institute Working Papers 231, Federal Reserve Bank of Dallas*

Swan, T.W. (1956), 'Economic Growth and Capital Accumulation', *Economic Record 32: 334 – 361*

Teignier, M. (2018), 'The Role of Trade in Structural Transformation', *Journal of Development Economics, Elsevier, vol. 130(C), pages 45-65*

Villaverde, J. and A. Maza (2008), 'Productivity Convergence in the European Regions, 1980-2003: A Sectoral and Spatial Approach', *Applied Economics, 40(10), 1299-1313*

Appendices

Appendix 1. Trend Analysis of Theil Index with respect to (w.r.t) Income and its Components, EU 2000-2017

Inequality Index	Average Annual Growth Rate	t-value	Adj. R-Squared
GDP	-0.035	-6.30	0.695
Agriculture	-0.029	-5.09	0.594
Industry	-0.023	-2.93	0.308
Service	-0.032	-9.42	0.838

Source: Author's calculation using World Development Indicators, World Bank Database

Appendix 2. Decomposed Standard Deviations

Variable		Std. Dev.
Share of Agriculture	overall	1.78
	between	1.63
	within	0.84
Share of Industry	overall	5.58
	between	5.20
	within	2.15
Share of Services	overall	6.57
	between	6.22
	within	2.39
lnY	overall	0.79
	between	0.73
	within	0.35
(lnY)^2	overall	15.48
	between	14.40
	within	6.62
lnP	overall	1.40
	between	1.42
	within	0.10
(lnP)^2	overall	44.03
	between	44.61
	within	2.86
lnTRADE	overall	0.47
	between	0.46
	within	0.12
PCD*lnTRADE	overall	2.37
	between	2.40
	within	0.23

Appendix 3. Trend Analysis of Theil Index with respect to (w.r.t) Income and its Components, ASEAN 2000-2017

Inequality Index	Average Annual Growth Rate	t-value	Adj. R-Squared
GDP	-0.028	-5.98	0.671
Agriculture	-0.038	-3.27	0.363
Industry	-0.053	-18.88	0.954
Service	-0.030	-18.08	0.950

Source: Author's calculation using World Development Indicators, World Bank Database

Global Financial Contagion: Building a Resilient World Economy after the Subprime Crisis, by Shalendra D. Sharma (Cambridge University Press), 2014, US$ 36.99

Six years after the great financial crash shook the world in 2008 its after-effects continue to be felt as the global economy struggles to regain its lost momentum. The depth and impact of the great crash was unlike anything the world had seen since the Great Depression, and it is therefore not surprising that scholars continue to debate the reasons that led to the crisis, and the way out of it.

The profound impact of the crisis has led several scholars to grapple with its causes and to identify remedies that will prevent a repeat of such an event. In his recent book, *Global Financial Contagion: Building a Resilient Economy after the Subprime Crisis,* Shalendra D. Sharma, a professor in the Department of Politics at the University of San Francisco, provides a lucid summary of the origins of the crisis, its aftermath and the way forward. The author examines the evidence presented by a broad cross-section of economists on the economic crisis and sheds light on the economics and political roots of many of the economic problems. He expresses his ideas and views in ten well-organized and well-linked chapters. In these chapters he examines in detail how the economies – Eurozone, Russia, China, India, East Asia and the Middle East – have been impacted, what their responses w e r e and what will be G20's role in this direction.

The origins of the crisis and the US response

Sharma points out that the three decade long period of great moderation in the US led to complacencies and lax policies which fuelled the financial crisis. The deregulation of financial markets accompanied by easy monetary policy led to excessive risk-taking by financial institutions. The benign macroeconomic environment led to hubris among policymakers who turned a blind eye to the growing risks.

According to macroeconomist John Taylor, interest rates were held far too low for far too long, fuelling asset bubbles, particularly in the housing industry.

As Altunbas (2010) of BIS has shown using quarterly balance sheet data of banks in the US and EU, a loose monetary policy can affect risk-taking in at least two ways: (i) through their impact on valuations, incomes and cash flows which in turn can modify how banks measure risk and (ii) through a more intensive search for a yield process, especially when nominal return targets are in place. These two ways may be amplified if agents perceive that monetary policy will be relaxed in the case of decreasing asset prices in a financial downturn (the so-called insurance effect) causing a classic 'moral hazard problem'.

The problem of moral hazard was aggravated because of the bailouts during the loans and savings crisis of the 1980s and the subsequent bailout of Long Term Capital Management, orchestrated by the Federal Reserve of New York a decade ago. These bailouts set the wrong precedent, creating a belief that the Fed would 'send in the cavalry' to rescue the financial sector whenever financial institutions faced a liquidity squeeze. 'The unqualified optimism or the "irrational exuberance" that such a promiscuous culture spawned took the underestimation of both risk and risk taking to new heights by inducing banks, non-bank financial institutions, and institutional and individual investors to increase their leverage and take increasingly aggressive (and risky) gambles,' writes Sharma.

As if these trends were not egregious enough, regulators went a step further and repealed the Glass-Steagall Act of 1933 which had maintained clear walls between the transparent and regulated world of commercial banking and the less regulated world of investment banking, and which had been a bedrock of financial stability since the Great Depression. Under the old regime, commercial banks, investment banks and insurance companies had divergent interests and their lobbying efforts tended to offset each other. But its repeal led to the creation of huge financial behemoths with convergent interests, giving the financial industry disproportionate clout in shaping the country's political and economic agenda, the author argues.

There were several political roots of the economic crisis. The growing clout of the financial industry and the consequent policy environment of light-touch regulation was one cause of excessive risk taking. The other problem arose from the political agenda of inclusiveness in home-ownership. There was a great deal of bi-partisan support in the US for the excluded to own homes, leading to relaxation in under-writing standards of mortgages, creating the initial conditions for a perfect storm in the housing market. The growth of the securitization industry and its increasing opacity meant that there was no way to price risks accurately.

It was ultimately these structural problems, including the lack of transparency, that led to the banking panic. As Gary Gorton argued in a 2007 research paper, it was not the case that all bank assets became toxic all of a sudden but the bursting of the housing bubble which was evident in rising foreclosures and the illiquidity in the corporate repo-market (which was at the heart of the links between the traditional and parallel banking systems) which led to a crisis of confidence. The fact that it was impossible to identify the precise location or magnitude of the risk and hence to price it, especially for the CDO and CDO-squared's made all securitized transactions look toxic to investors causing a hurried exit from the repo market, accompanied by distress sales. The panic also led to a multiplier effect on the fall in home prices as mortgage-sellers discovered that there were few takers at the going prices as the reality of the credit excesses of the past sunk in.

There were profound political changes underlying the economic transformation in the US. The author documents the rising campaign contributions of the financial industry in the years leading up to the crisis and argues that the nexus between financial and political elites made such excessive financialization and deregulation possible, which might have aided growth in the short term but ended up creating the crisis. The other consequence of such an arrangement was a neglect of the anxieties of the lower and middle classes, who were increasingly feeling left out in the new economy. A palliative came in the form of

easy credit which worked in the short-run but ended up creating long-term problems. Sharma also cites Prasad and Rajan to buttress his case. According to Prasad (2012), the US has long promoted consumption-driven growth as an alternative to a welfare state. Hence, easy credit has served as an alternative to the country's poorly developed social welfare system. Rajan (2010) has argued that the political response to growing inequality in the US was in the form of easy credit, which provided the immediate gratification of greater consumption and jobs while postponing paying the inevitable bill to the future.

Sharma argues that the US response to the crisis was unimaginative, and the bailout packages of the Bush and Obama administrations were built on a false 'Keynesian' hope that state backed stimulus packages could lift the economy. The author is also critical of the Obama administration's efforts to correct historical inequalities by spending on education and universal healthcare though he does not outline what the alternative could be. Sharma writes that spending by the US treasury has failed to boost the economy to a sustained growth path. While it could be true that some of the spending has been wasteful, the author fails to examine the counter-factual: what the state of the US economy would have been in the absence of the stimulus packages.

The contagion effect

The rapid pace of globalization of the financial and real economy over the past few decades led to a contagion effect across continents, writes the author. Europe's economy was most vulnerable because of its deep linkages with the US, similar financial and real estate problems as the US and also because of the high levels of sovereign debt in peripheral European economies such as Greece and Portugal. As credit markets froze following the great cash, the vulnerabilities of the peripheral economies and the contradictions within the European Union came to the fore. Despite adopting similar stimulus packages as in the US, it has been even more difficult for Europe to stabilize its economy.

The monetary compact of the European Union (EU) without a similar fiscal compact has proved to be its weak spot. The difficulties of

coordination among economies that are recovering at different speeds within the union has only exacerbated risks and raised costs of funding for sovereigns with weak balance sheets. The author is of view that the chances of a breakup still remain and the future of the EU does not appear bright without deeper fiscal integration.

The author suggests 'Although confidence has improved (that is, risk aversion has been tempered) since the ECB (European Central Bank) offered to buy the bonds of struggling economies, namely Spain and Italy, the bloc must continue to improve investor confidence by aggressively pursuing and building on the gains of the past three years.'

The financial crisis not only impacted Europe but also left a deep scar on the rest of the world. Although the origins of the Great Recession and its rapid transmission lay in the financial sector, world trade was not immune for very long, writes Sharma. Emerging economies experienced twin shocks --- first, a sudden stop of capital inflows driven by global deleveraging (and the resultant unwinding of positions), and second, a collapse in export demand. Countries with poor or limited global financial linkages were mainly impacted through the trade channel, whereas countries with deeper financial linkages were impacted via the financial channel. The ones most adversely impacted were economies with high current account deficits, high levels of indebtedness, low foreign exchange reserves and imprudent credit growth. Most developing economies were negatively impacted because of large-scale drops in commodity prices, deterioration in their terms of trade and the tightening of global credit.

Sharma highlights two key factors behind the sharp contraction in global trade. The first is expanding vertical specialization, where countries specialize in a particular stage of a good's manufacture or assembly, causing increased dependency on global supply chains. The rationale is that intermediate goods typically cross borders several times before being assembled into a final product, and any disruption of product inputs negatively impacts all, especially countries 'downstream' or at the later phases of production as they have the higher imported content

in their exports. Second, since international trade requires various types of financing, the extremely tight credit conditions and the resultant shortage of liquidity (especially US dollars), coupled with rising cost of trade finance, contributed to a sharp fall in economic activity.

The global response and its limitations

The author argues that the global crisis has created a crisis of confidence in the market-driven economy and led the world to seek alternatives that can yield greater stability: 'In the aftermath of the crisis, the view that markets are inherently volatile, unpredictable, and prone to booms and busts, and thus require the guiding hand of a benevolent state to repair wrecked economies and protect average citizens from the corrosive impact of crises and crashes, they had no role in creating, seems to be again ascendant.'

The author also hypothesizes that this shift towards activist states that make important interventions in the economy may reflect 'only a fleeting and ephemeral pendulum swing' rather than a paradigm shift. He is doubtful that an activist Keynesian state can be the solution to today's problems. The solution, in his view, lies in the design of improved political institutions that can allow market economies to function efficiently, while tempering the excesses that markets and self-interested behaviour can sometimes lead to. In order to more effectively balance regulation and risk, the author suggests generating a creative synergy of markets and government, or what the 'varieties of capitalism' school has described as 'institutional complementarities'.

The importance of credible and effective institutions at a global level is as much as it is at the domestic level *albeit* it is much more difficult to put in place such institutions or even a credible framework at the global level. Like previous episodes, this crisis has also led to calls for a new international financial architecture that is resilient to financial shocks and is more equitable and sustainable. But the author is not very hopeful about progress on this front, nor does he see a decisive agenda for change backed by key economies.

The author quotes economic historian Charles Kindleberger to drive home his point that the absence of a powerful hegemony in today's world has led to a state of flux, with little progress towards rebuilding the global financial architecture and putting the global growth engine back on track.

'The conspicuous absence today of a global leader is again making the painstaking work of stabilising the international order exceedingly difficult,' writes Sharma. However, in the absence of a hegemony or concert of powers, a multilateral body such as the G20 can be expected to find a way out of the global mess but the author is not very optimistic about the grouping. He argues that after an initial phase of decisiveness and joint action in the immediate aftermath of the crisis, the cohesiveness within the group has disappeared and it is unable to make headway in addressing core issues of global imbalances.

Sharma also points out that the initial response to the crisis in the form of a coordinated global stimulus by major economies was a panic reaction driven more by self interest than anything else. As the economic recovery began proceeding at different speeds in different major economies, fissures surfaced within the G20. The widening distance between national and global interests meant that coordination became increasingly difficult. This was particularly so in relation to monetary policy. While the US tried to isolate China within the forum for failing to rebalance its economy and recalibrate its currency, Washington's own pursuit of self-interest by driving an expansionary monetary policy which endangered the fragile recoveries of emerging markets, was called into question.

Even in areas where the G20 agreed such as on the new Basel norms, implementation was delayed. The G20 has very little to show in terms of actual outcomes after that initial spark of bonhomie in the immediate aftermath of the crisis, contends Sharma. However, it is rightly pointed out that the institutional weakness of the G20 has prevented it from playing a truly decisive role in reshaping the world economy. The G20 lacks a formal adjudicating and enforcement system. It even

lacks a formal voting system so it is not possible to ascertain different members' views, and all agreements are those which are agreed upon by consensus. Its utility has diminished steadily since the crisis as argued by the author.

In *Global Financial Contagion*, Sharma may not be presenting a novel or original insight into the problems plaguing the global economy, but he manages to provide an accessible account of what went wrong in the run-up to the crisis and how efforts at global coordination have faltered since then. The book also exposes the problems with multilateral structures that are supposed to lead the way out of the current mess, and ends on quite a pessimistic note on the future of the global financial architecture and the global economy.

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