Trans Pacific Partnership Agreement (TPPA): Implications for Malaysia's Domestic Value-Added Trade

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Abstract: The paper critically examines the existing literature on evaluating the 'gains' and 'losses' of entering any trade agreements, especially for developing countries. Most of the studies use Computable General Equilibrium Analysis (CGE) for undertaking such an analysis. Highlighting the limitations of CGE analysis, which mainly emerge from its inconsistent and unrealistic assumptions, the paper argues that it is important to estimate the impact of entering trade agreements on member countries' domestic value added (DVA) exports rather than on 'gross exports'. Given the rising importance of Global Value Chains, many developing countries are experiencing a decline in their DVA exports, although their gross exports are rising. This can lead to over estimation of production-linked gains from trade. Malaysia is also experiencing a decline in its DVA exports. In this context, the paper estimates the impact of Trans Pacific Partnership Agreement (TPPA) on DVA trade of Malaysia with other partner countries. The paper suggests that an appropriate indicator to use for assessing net gains from TPPA is bilateral value-added exports, which captures only direct domestic value-added trade between partner countries and reflects the 'net payment ' received in gross exports. This is different from 'exports of value-added' indicator reported in OECD-WTO TiVA, which adds direct as well as indirect DVA exports of a country to its partner country. Dynamic gravity model using 'bilateral trade in value added' instead of 'bilateral trade' is estimated. The results of the model show that TPPA12 will result in rise in DVA exports of mainly three countries, viz USA, Japan and New Zealand. Malaysia will experience a decline in its DVA exports of USD 17 billion on an average per annum. This will lead to deterioration in its BOT with TPPA partner countries.

The paper further estimates the impact of tariff liberalization among TPPA member countries on Malaysia's sectoral trade. The analysis is undertaken using partial equilibrium analysis at a HS six-digit disaggregated product classification in order to identify the products that may experience a change in their trade post TPPA. Trade creation as well as trade diversion is estimated for these products along with their source of imports and destination of exports. The results show that due to the existing FTAs among TPPA member countries, the impact of tariff liberalisation will not be that much. Malaysia's balance of trade will worsen by around USD 1.5 billion per annum with imports rising by around USD 3 billion and exports by around USD 1.5 billion. Malaysian industries which will face a rise in imports above USD 100 million per annum are vehicles, followed by iron and steel sector, mineral fuels, plastics and articles, boilers and rubber and articles, aluminium and articles and tobacco. Most of the increase in imports comes from USA and Japan.

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1. Introduction

With the growing realisation that multilateral trade negotiations may take much longer time to conclude than what was envisaged in the beginning of the Doha Development Agenda in 2001, the focus of policymakers, especially from the developed countries, has shifted towards mega free trade agreements (FTAs). These agreements are plurilateral in nature engaging developed as well as developing countries. The motivations behind these mega FTAs include quick economic as well as strategic gains. One such mega FTA is the Trans Pacific Partnership Agreement (TPPA) engaging countries across different continents. TPPA negotiations began as Trans-Pacific Strategic Economic Partnership Agreement in 2005 which included 4 countries namely Brunei, Chile, New Zealand, and Singapore. In August 2014, the agreement was being negotiated between 12 countries of the Asia pacific region. These include along with the original members, Australia, Canada, Japan, Malaysia, Mexico, Peru Vietnam and United States of America (USA). TPPA aims at expanding this initial group to include additional countries throughout the Asia-Pacific region[2].

TPPA stands out from other regional trade agreements in terms of its nature and scope. It goes much beyond the existing trade agreements in the Asia pacific region and includes 29 chapters on traditional as well as new issues, which include investments, services, financial services, competition, government procurement, labor, Intellectual property, environment etc. Further, all TPPA negotiating partners have entered into a confidentiality arrangement which makes any analysis of the implications of TPPA on member countries extremely challenging until they release the text.

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[2] http://www.ustr.gov/about-us/press-office/fact-sheets/2011/november/united-states-trans-pacific-partnership

While there exist a number of empirical studies that have examined the implications of TPPA on the member countries, given the confidentiality in the negotiations, most of the analyses have been limited to the impact of TPPA on trade. Most of the studies have used various versions of Computable General Equilibrium Models (CGE) to simulate the impact of TPPA on exports and imports of partner countries, including trade diversion and trade creation, thereby estimating the impact on member countries' GDP, employment and welfare.

Studies using general equilibrium models like CGE for estimating the costs and benefits of TPPA viz. Petri et al (2011), PIIE (2012), Cheong (2013), Xin (2014), Litkara (2014) Kenichi K. (2011) etc. assess the likely impact on both- the participating and the non-participating countries and regions- under different trade block scenarios, which are *a-priori* estimations using simulations. These models have been heavily criticised for their unrealistic assumptions. These limitations are elaborated in section 3 of the paper. However, one of the main limitations of these models is they assume that exports arising from the enhanced market access due to FTAs like TPPA will continue to originate from 'within' the country analysed, i.e., countries will continue to use the same proportion of inputs from other sectors of their economy as they have been doing pre FTA. The models accordingly estimate the rise in output and employment associated with increase in exports.

However, in the emerging global scenario, with rising importance of the global value chains (GVCs) and trade in intermediate products being 70% of the total trade (UNCTAD 2013), many countries have large proportion of exports comprising of imports of intermediate products. In fact, in many countries, linking into GVCs has actually declined the 'domestic value-added content' in their exports (Banga 2014). Mega FTAs like TPPA, with liberal provisions on foreign direct investments and trade in services, are more likely to increase the imports of inputs of member countries which are used in their exports. This would imply that an estimated "rise in exports" by models like CGE, may not be translated into rise in output and employment but may actually be fed by imports from partner countries, declining the existing domestic value-added content of exports of some member countries. This can have adverse implications for domestic production and employment for some of the courtiers engaged in TPPA. This aspect has been completely ignored by the existing literature.

In the case of Malaysia, it is found that like many other developing countries, Malaysia has been experiencing a fall in domestic value added content in its exports to the world. This

declined from 60% in 1995 to 58% in 2005, after which the domestic value added in exports rose to 62% in 2009. However, unlike its global trend, with respect to other TPPA partner countries, Malaysia's Domestic Value Added Exports (DVA Exports) have been steadily declining over the years. This decline has been experienced with respect to all major TPPA members like US, Mexico, New Zealand, Singapore and Japan. Maximum decline in DVA exports of Malaysia has been with US, where it has declined from 65% in 1995 to 42% in 2009. This implies that if Malaysia's exports to US increase by $100, only $42 will be retained within Malaysia and the rest will trickle out of the country. Only $42 will add to total production and generate production linked employment. Studies therefore need to adjust accordingly the expected production-linked gains of exports. On the other hand, DVA exports of most of the TPPA partner countries to Malaysia have increased over the years. For example, US increased its DVA exports to Malaysia from 85% in 2005 to 89% in 2009, for Singapore the respective increase was from 58% to 64%; New Zealand- 69% to 74% and Canada- 55% to 58%[3].

Rise in DVA exports is important for a country in order to get the commensurate production-linked gains of exports. The gains from any regional trade agreement to a country will come not from increased 'exports' per se, but from increased 'domestic value-added exports'. Further, there can be no employment gains if DVA exports actually declines after the trade agreement. It has therefore become increasingly important for developing countries to focus more on *producing more for trade '* and not *'exporting more'*. All regional and bilateral FTAs should be analysed with respect to their contribution to DVA exports and not gross exports. Accordingly, the analysis in this paper is based not on 'trade' but on 'trade in domestic value-added'. The paper estimates the impact of TPPA12 on its member countries, focusing on DVA exports. The analysis is undertaken in greater detail for Malaysia, given its trend of declining DVA exports.

To measure the net domestic value-added created by trade in TPPA, a new dataset is used which has been made available by WTO-OECD. This database uses harmonized input-output (I/O) tables of different countries. Analyses based on input-output tables provide a useful alternative to trade data. An important advantage of I-O tables is that they classify goods according to their use (as input into another sector's production or as final demand); and

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[3] Source- WTO-OECD Trade in Value Added database

include information on inputs of/in services sectors, allowing for the analysis to include services trade. This database, released in 2013 on Trade in value-added (TiVA), covers 58 countries (including all OECD countries; BRICS countries; Newly Industrialised Countries Tier-1 (NICs1); NICs2, Cambodia, Brunei Darussalam and 'Rest of the world') for the years 1995, 2000, 2005, 2008 and 2009 using harmonized input-output tables of these countries.

Using data on domestic value-added exports and domestic value-added imports of all TPPA member countries (12), the paper estimates the impact of TPPA12 on Malaysia's domestic value added exports, further on its balance of trade. To undertake this analysis, the paper deviates from the existing literature using CGE for impact analysis of TPPA and estimates a dynamic gravity model, using existing bilateral domestic value-added trade of member countries and gravity variables. Gravity models are being increasingly used for estimating impact of regional FTAs[4]. Given the various provisions of TPPA, which aim at removing various restrictions and regulations among the TPPA member countries, predicted bilateral trade in domestic value-added based on gravity model, will be much closer to post TPPA reality as compared to the other trade models. Further, the paper estimates the impact of tariff liberalisation on different sectors of the Malaysia.

The rest of the paper is organised as follows: section 2 briefly examines the provisions of TPPA; section 3 reviews the literature on impact analysis of TPPA on Malaysia and provides a critique of CGE models; section 4 reports the methodology and data used; section 5 examines the existing trends in Malaysia's bilateral domestic value added trade with TPPA partner countries; section 6 presents the results of the Trade-in-Value-Added Gravity Model (TiVA-Gravity) for all TPPA member countries; section 7 estimates the impact of tariff liberalisation on Malaysia's trade with TPPA member countries including sectoral estimations based on partial equilibrium analysis; section 8 summarises and concludes.

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[4] See Bergstrand and Egger (2011) for developments of gravity models since1960s and their use in explaining the impact of regional FTAs. http://www3.nd.edu/~jbergstr/Working_Papers/Gravity_Survey.pdf

2. TPPA Provisions: Brief Review

The TPPA is a potential free trade agreement aimed at creating a platform of economic integration across the Asia Pacific region. This is an expansion of the 2005 Trans-Pacific Strategic Economic Partnership Agreement (TPPA) that included originally 4 countries namely Brunei, Chile, New Zealand, and Singapore. In August 2014, the agreement was being negotiated between 12 countries of the Asia pacific region. Other countries such as South Korea, Taiwan, Philippines, Laos, Colombia and Indonesia, Cambodia, Bangladesh, Thailand and India have also expressed their interest to be a member of the TPPA. Though most of the countries involved in the agreement are already into some sort of trade agreements, either bilateral or multilateral, for years the present partnership treaty goes beyond the existing partnership agreements in terms of its scope.

The text of the negotiation is based on 29 chapters which cover both the traditional areas in FTAs and the new issues. Of the 29 draft chapters only eight deal with traditional trade issues. The traditional issues in TPPA chapters cover the market access, technical barriers to trade, sanitary and phytosanitary measures, rules of origin, customs cooperation, investment, services and legal and institutional aspects of the negotiation. The new FTA issues include government procurement, competition, intellectual property, labour and environment issues. The negotiation covers the legal texts which prescribe rules and disciplines on the subject areas; and market access which confers access opportunities for goods, services, procurement and investment. The legal texts cover all aspects of commercial relations among the TPPA countries are virtually complete except in some areas where the differences remain. In the later stage, further negotiations and discussions are required on specific issues that still remain sensitive.

The first round of negotiations on TPPA commenced in March 2010 and the original participant's countries were Australia, Brunei, Chile, New Zealand, Peru, Singapore, United States and Viet Nam. During the third round at Brunei Darussalam, Malaysia joined the negotiations and in December 2012, at the 15th Round, Mexico and Canada were accepted as members to TPPA. Similarly, Japan joined in the 18th round held in Malaysia.

Given the confidentiality agreement between the partner countries, provisions in most of the chapters have remained out of the public domain. Some of the leaked chapters include investment chapter. TPPA's investment text emphasizes a substantive legal protection to the

investment and the investors of each TPPA country in its TPPA partner countries. The TPPA envisages elevating individual foreign firms to equal status with the sovereign nations. The negotiations aim at providing the investors a non-discriminatory and a minimum standard of treatment and restrict performance requirements for foreign investments. The text aims to include provisions for expeditious, investor-state dispute settlement. Though the investment chapter has not been officially released by the trade negotiators but the leaked document reveals that TPPA would restrict the signatories from regulating foreign firms operating within their boundaries.

The TPPA would expand on the investor privileges found in the North American Free Trade Agreement (NAFTA) and subsequent NAFTA-style deals. The leaked documents claim that TPPA includes the provisions to acquire land, natural resources, factories without adequate government review and the right to move capital without limits for foreign investors. Risks and costs of offshoring to low wage countries are reduced and special guarantees are provided for "minimum standard of treatment" for relocating firms. Under this regime, foreign investors can directly sue the host government before tribunals of three private sector lawyers operating under World Bank and UN rules to demand taxpayer compensation for any domestic law that investors believe will diminish their "expected future profits." Similarly, on cross border services the TPPA partner countries have agreed on most of the cross border service text that is likely to include a open market for services trade. On goods negotiations, although not much is in public domain, it is expected TPPA will include a 'yarn forward' rule of origin, which is a standard USFTA requirement. This rule requires the TPPA nation to use a member-produced yarn in textiles in order to receive duty-free access.

3. Critical Review of Existing Empirical Literature on Implications of TPPA on Malaysia

Although the confidentiality clause in the negotiations of TPPA has severely limited the researchers in estimating more accurately the likely impacts of TPPA on participating countries, there are a growing number of studies which estimate the likely impact of the TPPA on trade in both participating as well as non-participating members. Majority of these studies use the Computable General Equilibrium (CGE) model with Global Trade Analysis Projects (GTAP) database for the quantitative assessments. These studies analyse various scenarios with possible trade blocs and implications for member countries of TPPA under

different scenarios. Some of these studies include Petri et al (2011), PIIE (2012), Cheong (2013), Xin (2014), Litkara (2014) and Kenichi K. (2011).

Although, CGE models continue to be popular models for analysing implications of regional FTAs on 'included' and 'excluded' countries, there exists a growing literature with consensus on the limitations of CGE modelling and its unrealistic assumptions which invariably lead to 'over-estimation' of gains, especially for small developing countries. We trace this growing literature on critique of CGE models listing the limitations of CGE models highlighted in this literature.

1. CGE models are designed in such a manner that liberalization will always lead to increase in 'overall gains'

According to Taylor and Arnim (2006), most of the CGE models assume (i) fixed or 'full' employment of labour and capital is maintained everywhere in the world (ii) each country's trade deficit (or surplus) stays constant after liberalisation; and (iii) completely flexible taxes on households enable each country's internal economy to adjust smoothly. This implies that the models are designed in such a way that 'the price system' will always respond to liberalisation in a way that it leads to increases in overall well-being. These assumptions are made in most of the studies assessing implications of TPPA including the PIIE (2012). These assumptions can have some important implications as follows:

➢ The assumption of 'full employment' would imply that as liberalisation takes place and tariffs decline, more competitive sectors will expand and absorb all the resources including labour which are released from the contracting and less competitive sectors. However, this is never the case in real world where the less competitive sectors contract at a much faster rate as compared to the expansion of competitive sectors. Given the sector-specific labour requirements of skills, etc., much of the labour remains unabsorbed leading to large scale unemployment. All this is assumed away by the model assumption of 'full employment'. According to Raza et al (2014) models that assume full employment will always produce positive gains in GDP.

➢ 'Constant trade balance' is assumed which implies that the budget deficit of the government is assumed constant. If revenues change due to tariff reduction or other trade policies, government expenditures must adjust endogenously to satisfy the fixed budget deficit. However, in real world this is never the case.

➢ Completely flexible taxes on households are assumed or as stated in PIIE (2012) and Petri et al (2011), "any changes in government budget are automatically compensated by income tax rates on households". This assumption along with the above two assumptions ensures that the two most important and variable indicators of macroeconomic performance do not change in any country. This will automatically generate gains in the long term.

➢ According to Charlton and Stiglitz (2005), CGE models do not capture persistence unemployment in developing countries. Trade liberalization can simply move workers from low productivity protected sectors into unemployment, lowering country's GDP and increasing poverty. CGE models fail to capture this effect because of its unrealistic assumptions.

2. 'Armington Assumption' in CGE Models is unrealistic and underplays displacements of domestic production due to trade policies

Many studies are pointing out the inconsistency in assumptions of CGE models. One particular study in this context is by Arvind Panagariya and Duttagupta (2001), who argue that CGE models which show 'gains' for a country from its own preferential liberalization are able to do so by using internally inconsistent assumptions. 'Armington assumption' used in all CGE models, including Petri et al (2011), implies that there exists 'product differentiation' which implies that no country, howsoever small, produces something which is also produced by another country in the world. In other words, domestic and foreign products are imperfect substitutes. This assumption is not only unrealistic but can have far reaching implications on calculation of welfare effects in CGE models. For example,

➢ The Armington assumption implies that home and foreign goods are imperfect substitutes so that if the price of one goes down, more of it will be consumed (and less of the other product will be consumed) but there will never be complete substitution. This will imply that CGE models underestimate the extent of domestic displacement that can take place due to imports of cheaper products.

➢ According to Tokarick (2005), this assumption implies that each country has some degree of market power (even for bulk commodities) and if prices change, no country can ever shift from exporting to importing a commodity. Further, it has to be pointed out that in real world product differentiation may not be location-specific but is

producer-specific, for example, cars produced by Honda in Japan will be similar to cars produced by Honda in any other country. This is not allowed in the CGE modeling. Cars produced by Honda will differ by country of origin.

➢ According to Arnim and Taylor (2007), higher the Armington elasticites assumed higher will be the *welfare gains* in CGE models. "If the fiscal deficit is assumed to be fixed, then a tariff reduction must be offset by higher income taxes which will induce a drop in consumption. Consumption should increase, on the other hand, because import prices fall. The Armington assumption, however, forces the pass-through of tariffs into supply prices to be less than 100%. Cutting tariffs thereby reduces consumption, a thoroughly non-intuitive result. As it turns out, the consumption crunch is lower (and welfare gains higher), the higher the Armington elasticity of substitution".

3. CGE models estimate 'static gains' or 'long-term gains', ignoring short-term 'adjustment costs' and therefore overestimate the 'total gains'

Most of the CGE models provide static results, i.e., change 'before' and 'after' a tariff change or a tariff simulation. Recent models have estimated 'dynamic gains' which are generally long-term. Petri et al (2011) provides results for 'long term' i.e., after ten years; automatically assuming away the displacements that may take place in terms of employment losses through contraction in domestic production. Further studies have pointed out that CGE models ignore important costs to the economy while estimating gains and losses. Some of these costs are:

➢ According to Raza et al (2014), the costs of 'regulatory changes' are never estimated by CGE models. The reduction of Non-tariff measures (NTMs) will invariable entail both short term adjustment costs and long term social costs, which are completely neglected, overestimating the gains from removal of NTMs. Some of the important macroeconomic adjustment costs include (i) changes to the current account balance, (ii) losses to public revenues, and (iii) changes to the level of unemployment.

➢ The 'tariff equivalent' used for estimating the impact of removing NTMs is often controversial. Most of the gains in CGE modeling arise due to removal of NTMs, if NTMs are modeled into the simulations. Bertram and Terry (2014) have highlighted the problems in some of the studies like Petri et al (2011) which use NTMs to model the overall gains to the participating members of TPPA.

4. CGE models do not capture 'vertical intra-industry trade' and therefore are unable to capture change in 'domestic value-addition' in 'likely increases in exports'

Majority of the studies using CGE models suggest that the TPPA agreement will benefit the smaller economies like Vietnam, Peru and Malaysia. PIIE (2012) shows that for Malaysia's exports, following TPPA, will rise by US$ 16 billion. The study uses CGE and Release 8 of GTAP dataset (with 2007 database) and corresponding increase in GDP is estimated to be around 4.7%; Cheong (2013) using CGE model and Release 8 of GTAP (2007 database) estimates that GDP in Malaysia with TPPA12 will rise by 0.7%. Both the studies use Armington assumption of similar products of different countries being imperfect substitutes leading to difference in their prices. They also use nested CES production function in the production technology in each sector.

While different studies arrive at different results using different assumptions, although using same models and GTAP dataset, one of the major limitations of all these studies is that their assumptions take into account the change in horizontal intra-industry trade across countries but fail to take into account the change in vertical intra-industry trade. These assumptions imply that producers can decide whether to sell their products in domestic markets or exports and consumers can similarly decide whether to use domestic products or imported products. However, these do not take into account the 'imports of intermediate products' that may be needed for 'increased exports' in each sector, especially post FTA. Given the rising importance of Global Value Chains, the studies grossly overestimate the related results of rise in exports with respect to change in GDP and resulting change in employment.

This paper takes an alternative approach and estimates the maximum potential 'domestic value-added trade' that can take place between TPPA 12 member countries, if no restrictions exist and trade takes place only with respect to pure gravity variables, which include existing trade costs due to physical distance and relative purchasing power of the importer economic distance between the member countries, the paper estimates potential bilateral trade in value-added as well as potential bilateral exports which can take place between TPPA 12 member countries. One of the benefits of this approach is that the model is able to estimates trade in 'domestic value-added' and predicts impact of TPPA on domestic value-addition because of change in exports. It is able to provide a picture of balance of trade which may result for

Malaysia due to TPPA. Given that TPPA goes much beyond trade and will also remove other non-tariff barriers and restrictions, gravity model provides a better fit than CGE models.

4. Methodology and Data Used

The paper uses theoretically justified Gravity model to estimate the implications of regional FTA on member countries' total and bilateral trade in domestic value-added. This is, to the best of our knowledge, the first paper to use Trade in Value-Added Gravity model (TiVA Gravity) for estimating the impact of TPPA. One of the main reasons for lack of literature in this area has been lack of data on bilateral trade in value-added. This paper uses WTO-OECD dataset on Trade in Value-Added (TiVA) which provides information on bilateral value-added trade for 58 countries (including all OECD countries; BRICS countries; NICs1; NICs2, Cambodia, Brunei Darussalam and 'Rest of the world') for the years 1995, 2000, 2005, 2008 and 2009 using harmonized input-output tables of these countries.

Gravity models are extensively being used for estimating the impact of regional FTAs and predicting bilateral and regional trade along with estimating trade creation and trade diverting impacts of FTAs. Originally proposed by Tinbergen (1962) for international trade, the gravity model predicts bilateral trade flows between any two countries as a positive function of their size and negative function of the distance between them, where distance is a proxy for trade costs. Studies use gravity model to explain bilateral trade, regional trade and impact of regional FTAs, particularly whether these will result in trade creation or diversion. More recently, gravity models are being used to estimate welfare effects of RTAs .

This study estimates Dynamic TiVA Gravity Model for the period 1995-2009 for 24 countries[5] using panel data estimations (GMM-Arellano and Bond 1991). Most of the earlier studies have used static model, which may result in biased results as trade is a dynamic process[6]. Use of panel data and country-pair fixed effects in the model account for the endogeneity of the integration effects and the existence of dynamic effects[7]. Dynamic models using GMM for estimating gravity models are also found to be more robust (Martínez-Zarzoso et al, 2009).

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[5] 12 TTPA member countries are included with two of their major trading partners who are not members of TPPA. Countries are selected for which domestic value added data is available are included.
[6] For detailed discussion see Eichengreen and Irwin 1997 and Bun and Klassen (2002)
[7] See Baier and Bergstrand 2007 and Baldwin and Taglioni, 2007

Two specifications are estimated, using 'bilateral trade in value-added' (bilateral TiVA) as dependent variables. These are with and without including the impact of tariff liberalisation on bilateral TiVA. The data on size variables have been extracted from the World Development Indicators. Distance variable is extracted from CEPII. The bilateral value-added data is used from WTO-OECD TiVA. The growth rate of bilateral value added exports between two distinct periods is applied to arrive at the continuous series of value-added trade for the period 1995-2009.

TiVA Gravity model is estimated, using relative GDPs and relative populations (or per capita incomes). Relative distance is used to capture bilateral trade costs. `Following Baier and Bergstrand (2007),` country-pair dummies are used to account for typical time invariant regressors, such as common language or border. Likewise time dummy is used to correct for potential trends in world trade. Similar model is estimated to explain bilateral trade by Bun and Klassen (2002). Impact of Tariffs in partner country is also estimated. TPPA member dummy is introduced. Arellano-Bond test for zero Autocorrelation in first differenced error has been undertaken. The model estimated is as follows:

$$\ln TiVA_{ijt} = \beta_0 + \beta_1 \ln TiVA_{ijt-1} + \beta_2 \ln(POP_{it} \times POP_{jt}) + \beta_3 \ln(GDP_{it} \times GDP_{jt}) + \beta_4(Distance_{ij}) + \beta_5 \ln Tariff_{jit} + \lambda ij + e_{ijt}$$

Where, $TiVA_{ijt}$ is bilateral trade in domestic value added between i and j in year t; GDP_{it} = GDP of country i at point t, GDP_{jt} = GDP of country j at point t; POP_{it} = population of country i at point t; Pop_{jt} = Population of country j at point t; $Tariff_{jt}$ is the simple average of tariffs in the importing country; Distance ij measures the great-circle distance between the capital cities (or economic centers) of country i and λij is the country pair dummy; and e_{ijt} = error term.

5. Existing Trends in Domestic Value Added Trade (DVA) in TPPA12

5.1 What Indicators to use for Bilateral Value-Added Trade for assessing gains and losses in FTA?

Gross exports may rise or fall with a partner country but what matters is the extent to which a country will gain bilaterally in terms of value-added trade, especially in a FTA with the

partner country. To estimate the bilateral value-added trade between two countries it is important to use the right indicator. OECD-WTO TiVA estimates and reports 'exports of value-added' from one country to another[8]. This includes both direct domestic value-added exports from one country to its partner country and indirect exports of domestic value added from one country to the partner country, which reaches the partner country via its exports of intermediaries to some third country. This indicator may not be a useful indicator when estimating bilateral trade, especially under a FTA. For example, if Malaysia's direct domestic value-added exports to USA is USD 100 million and it exports intermediaries to some African country, which is not a part of TPPA, of USD 40 million. This African country uses the intermediate products imported from Malaysia in its exports to USA. Then the indicator used by TiVA would show export of domestic value added of Malaysia to USA as USD 140 million. However, in TPPA it should be only 'direct net bilateral domestic value-added trade between USA and Malaysia' that should be considered as indirect exports will continue with or without FTA since the preferential tariffs and other non-tariff agreements do not include indirect exports. A better indicator which would reflect the net bilateral value-added trade of Malaysia with USA would be 'Gross Exports of Malaysia to USA minus Foreign Value Added of USA in Malaysia's Exports'. This would reflect the 'net payments' which Malaysia receives from its value-added exports to USA.

On similar lines, the 'participation index' estimated and reported by TiVA as an indicator of the extent of participation of a country in Global Value Chain may not be the right ratio to estimate. According to this ratio, the extent of participation of USA in global value chains is found to be lower than countries like Saudi Arabia or India. A better ratio that could be used as an indicator is the share of a country in total value added created by global trade, as suggested by Banga in her article "Linking into Global Value Chains Is Not Sufficient: Do You Export Domestic Value Added Contents?" Journal of Economic Integration, Vol.29, No.2: 267-297.

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[8] OECD-WTO TiVA defines this as "Value-Added embodied in Foreign Final Domestic Demand shows how industries export value both through direct final exports and via indirect exports of intermediates through other countries to foreign final consumers (households, charities, government, and as investment). It can most readily be interpreted as 'exports of value-added'.

Using the suggested ratio of 'gross exports of Malaysia to partner country minus partner country's foreign value added in gross exports of Malaysia' bilateral value-added exports of Malaysia to 12 partner countries in TPPA is estimated.

It is important to note that Malaysia has been experiencing a rise in both its exports and imports but has maintained a favourable balance of trade over the years. BOT increased from $16.4 billion in 2009 to $21.2 billion in 2012, although it declined thereafter to $19.9 billion in 2013.

5.2 Trends in Malaysia's Bilateral Value-Added Exports to TPPA Member Countries

With respect to TPPA member countries, Malaysia's gross exports to USA increased from USD 23 billion in 1995 to USD 34 billion in 2005 and further declined to USD 30 billion in 2008. In 2009, the gross exports declined to USD 23 billion. This trend of rising gross exports of Malaysia is found for almost all TPPA member countries (Figure 1).

Figure 1 Malaysia's Gross Exports to TPPA Member Countries: 1995-2009
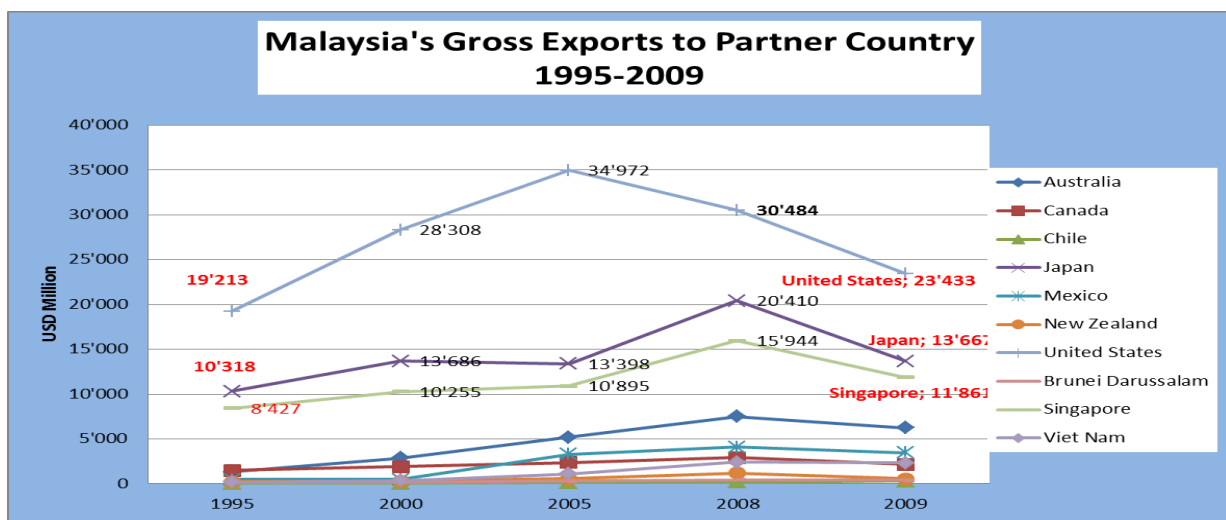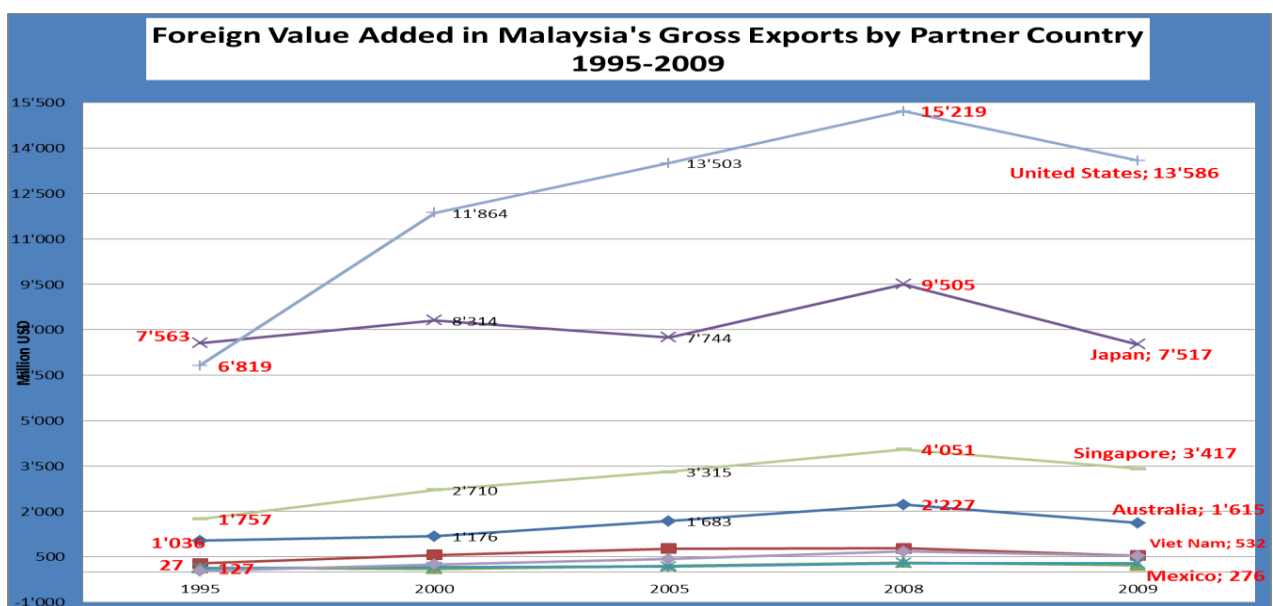

Source: WTO-OECD TiVA

However, foreign value-added by partner TPPA member countries in Malaysia's gross exports has also been rising in this period (Figure 2). This rise has been much faster than the rise in Malaysia's gross exports to them, which would imply a fall in 'net payments' to Malaysia from partner countries for its gross exports. Foreign value added by USA in

Malaysia's Gross Exports increased from USD 6.8 billion in 1995 to USD 15 billion in 2008. In 2009 it declined to USD 13.5 billion. If this is subtracted from Malaysia's gross exports to USA in 2009, it is found that 'net payment' to Malaysia from USA for its gross exports would be around USD 10 billion (USD 23.4 billion minus USD 13.5 billion). Foreign value added (FVA) by Japan in Malaysia's gross exports increased from USD 7.5 billion to USD 9.5 billion in 2008. FVA of Singapore and Mexico in Malaysia's exports more than doubled in this period, while that from Vietnam increased by more than 20 times (snapshot from the OECD-TiVA is presented in Appendix Table A.1).

Figure 2: Foreign Value-Added by TPPA member countries in Gross Exports of Malaysia

Source: WTO-OECD TiVA

These two trends show that Malaysia's net payments for its value-added exports to TPPA partner countries have been declining over the years. This decline in domestic value added exports has been experienced for all major TPPA members like USA, Mexico, New Zealand, Singapore and Japan. Maximum decline in Domestic Value Added exports of Malaysia has occurred for USA where it has declined from 65% in 1995 to 42% in 2009 (Figure 1). This implies that even if Malaysia's gross exports to USA rise, Malaysia will not gain 100% from it in terms of rise in production and employment. *Only 42% of exports to USA will lead to related rise in domestic production*. The rest will go back to USA as payments for its foreign value-added in Malaysia's gross exports. Studies estimating the impact of rise in exports of

Malaysia to USA on output and correspondingly on employment need to adjust the gains from exports and lower them by at least 58%.

Using the ratio 'gross exports of Malaysia *minus* foreign value added in its exports by partner countries in TPPA', as an indicator of its net gains from TPPA, we arrive at Malaysia's bilateral domestic value added exports with TPPA member countries.

Figure 3: Malaysia's Bilateral Domestic Value-Added Exports to TPPA Members
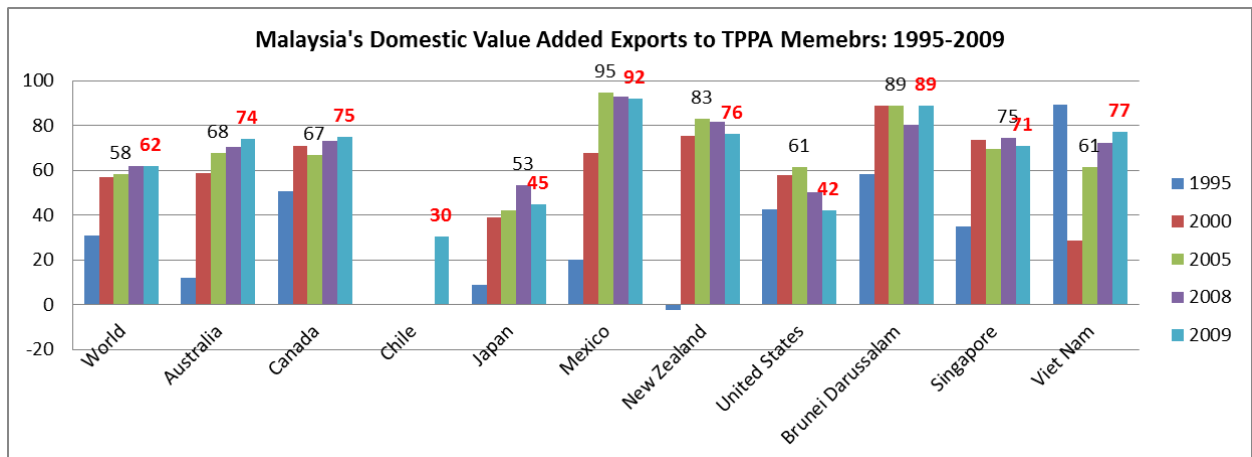
Source: WTO-OECD TiVA

Using the same indicator, we estimate the share of different countries in Malaysia's total domestic value-added exports to the world. It is found that share of USA has declined steadily from around 20% in 1995 to around 7% in 2009 (Figure 4). *All TPPA members together have a share of not more than 40% in total value added exports of Malaysia*, while their share in Malaysia's total exports is around 60%. The importance of exporting to these countries for raising Malaysia's domestic production should be accordingly downsized.

Figure 4: Share of TPPA members in Malaysia's Global Domestic Value Added Exports
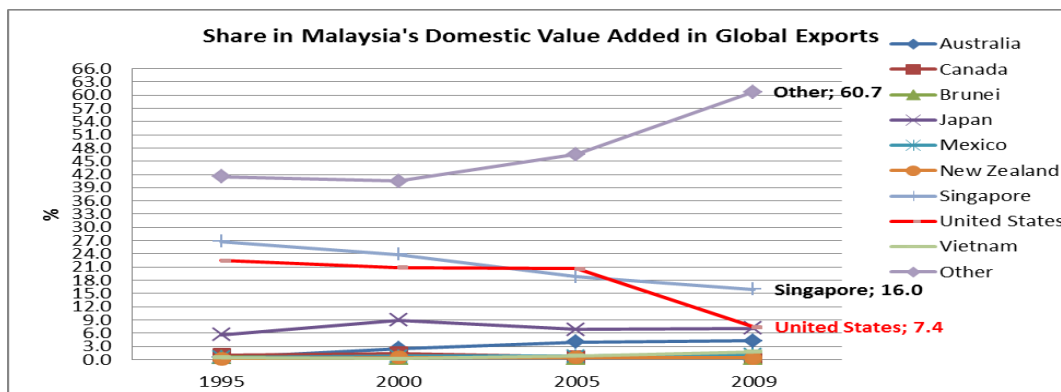
While Malaysia's bilateral DVA exports to TPPA members have been steadily declining, the TPPA's member countries foreign value added in Malaysia's exports has been rising. Malaysia is therefore becoming an important destination for the exports of these countries, especially USA. Bilateral domestic value added exports of USA to Malaysia (Gross exports of USA to Malaysia minus foreign value-added by Malaysia's in gross exports of USA) is around 89% while that of Japan is 85% (Figure 5).

Figure 5: Share of TPPA Members in Malaysia's Domestic Value Added Imports
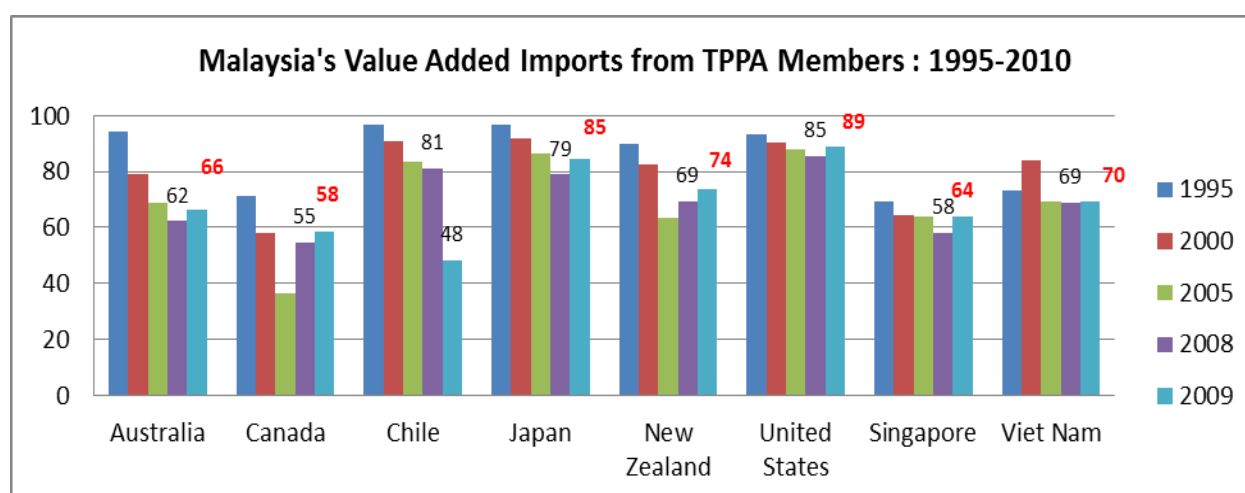
Source: WTO-OECD TiVA

In the context of falling bilateral DVA exports of Malaysia to TPPA partner countries, which reflects declining net payments for its exports to these countries, we estimate the gravity model to assess the implications of TPPA on Malaysia's DVA trade with TPPA member countries.

6. Estimations of 'Trade in Value-Added' Gravity Model (TiVA Gravity Model)

6.1 Estimated TiVA Gravity Model

Table 1 reports the results for the estimated TiVA Gravity model for bilateral trade in value-added. The results show that the first lag of TiVA is statistically significant and robust indicating that trade is a dynamic process and therefore dynamic panel data estimates are better than static estimates of gravity model. Distance and relative sizes in terms of GDP and population (or per capita income) are found to be statistically significant and of the right signs. Distance, as a proxy of trade costs, has a negative impact on bilateral DVA exports

while higher relative purchasing power increases bilateral DVA trade. Preferential tariffs between bilateral pairs in TPPA may lead to on an average, an increase of around only 1% in bilateral DVA trade. Most of the TPPA12 countries are already enjoying tariff preferences with their partners under some or the other FTAs.

Table 1: Results of Dynamic Panel Data Estimations of Trade in Value-Added Gravity Model (TiVA- Gravity Model)

	Bilateral Trade in Value-Added (1)	Bilateral Trade in Value-Added (3)
Variables↓	Coefficient (t-stat)	Coefficient (t-stat)
Bilateral Trade in Value-Added (Lag1)	0.51*** (77.3)	0.70*** (97.0)
Bilateral Trade (Lag 1)		
Relative Per Capita Income	0.31*** (92.7)	0.16*** (52.2)
Relative Distance	-0.93*** (-20.5)	-0.91*** (-18.5)
Tariff in Importing Country		-0.01*** (-14.58)
Country pair Dummy	YES	YES
Constant	1.47*** (23.8)	0.64*** (13.4)
prob> Wald chi2	0.00	0.00
Number of observations	7100	6220

Note: A two-step Dynamic Arellano- Blundell-Bond estimations are carried out. Panel data consists of 24 countries including 12 TPPA member countries for the period 1995-2009. Arellano-Bond test for zero autocorrelation in first-differenced errors is performed for all specifications. No autocorrelation is found in the above specifications. Peru and Brunei were dropped from estimates due to significant gaps in their data.

6.2. Potential Trade in Domestic Value-Added of TPPA Members using TiVA Gravity Model

Using the estimated dynamic TiVA gravity model, bilateral trade in DVA is predicted between TPPA12 member countries. As discussed, this model is estimated using panel data for the period 1995-2009. The model estimates the maximum potential of trade that 12 TPPA member countries can have in terms of Domestic Value Added, based just on gravity. This model is a closer fit to reality given the TPPA provisions. These provisions aim at removing

all restrictions and regulations with respect FDI and trade in services; and remove all existing non-tariff and tariff barriers[9].

Studies may point out that TPPA will be a win-win situation for all countries in terms of rise in exports, but it is important to estimate the change in domestic value-added in exports post TPPA in order to reach to any conclusions about rising exports and related gains in terms of production and employment. The results are reported in Table 2. The first three columns report the existing exports, imports and balance of trade (BOT) in 2013. These show that the exports of TPPA12 member countries in 2013 are around USD ($) 1.8 trillion. Of this, USA has the largest share of $588 billion, followed by Canada ($366 billion), Mexico, Japan and Singapore. The rest of the countries' export less than $100 billion. In 2013, Malaysia exports around $93.7 billion to other TPPA12 member countries and imports around $73.8 billion. It therefore has a positive balance of trade (BOT) vis-à-vis TPPA member countries of around $19.8 billion. BOT of US is found to be negative with respect to TPPA countries. This is of the amount $278 billion in 2013 implying that USA imports much more from TPPA countries than it exports to them.

Existing DVA exports, DVA exports as a percentage of Total Exports and Predicted DVA exports per year post TPPA are reported in columns 4, 5 and 6. It is found that DVA exports to TPPA partner countries as a proportion of total exports are as high as 80% in many of the TPPA countries. But in USA, Malaysia and Singapore it is much lower at around 50%. In Vietnam it is around 75%. Post TPPA, predicted DVA exports per annum increase in USA, Japan and New Zealand. USA has a potential to increase its exports of domestic value added to TPP12 countries by around $155 billion. (52% of its existing DVA exports); while Japan's potential increase in DVA exports is $ 87 billion (49% of its existing DVA exports).

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[9] *"TPPA will provide new market access for Made-in-America goods and services, strong and enforceable labor standards and environmental commitments, ground breaking new rules on state-owned enterprises, a robust and balanced intellectual property rights framework, and a thriving digital economy. It will also include commitments that will improve the transparency and consistency of the regulatory environment to make it easier for small- and medium-sized businesses to operate across the region. By opening these new markets to American products, TPPA will help ensure that we are not left behind by our competitors in a vital region of the world"…*http://www.ustr.gov/TPPA

Table 2: Results of Dynamic Gravity Model on Potential Domestic Value Added Trade in TPPA12 Members

	Exports to TPPA countries in 2013 (USD '000)	Imports 2013 (USD '000)	Balance of Trade in 2013 (USD '000)	Domestic Value Added (DVA) Exports in 2013 (USD '000)	DVA Exports as a Percentage of Total Export in 2013 (USD '000)	Predicted DVA Exports (USD '000)	Percentage Change in Predicted DVA exports Post TPPA (USD '000)	DVA exports minus Imports in 2013 (DVA BOT) (USD '000)	Predicted DVA BOT (USD '000)	Change in DVA BOT (USD 1000)
United States	588'022'109	866'456'611	-278'434'502	297'594'585	51	453'359'888	52	-568'862'026	-413'096'723	155'765'303
Australia	59'183'792	79'278'324	-20'094'532	50'691'678	86	43'739'436	-14	-28'586'646	-35'538'888	-6'952'242
Canada	366'910'069	290'596'827	76'313'242	312'736'706	85	231'259'350	-26	22'139'879	-59'337'477	-81'477'356
Chile	23'669'310	25'173'043	-1'503'732	18'844'895	80	16'670'559	-12	-6'328'148	-8'502'484	-2'174'336
Japan	208'720'414	221'692'156	-12'971'743	178'534'468	86	265'793'217	49	-43'157'688	44'101'061	87'258'749
Mexico	318'409'018	225'915'853	92'493'165	249'929'963	78	179'666'617	-28	24'014'110	-46'249'236	-70'263'346
Malaysia	**93'727'339**	**73'889'475**	**19'837'864**	**54'449'405**	**58**	**36'818'591**	**-32**	**-19'440'070**	**-37'070'884**	**-17'630'814**
New Zealand	15'142'569	10'901'781	4'240'788	12'134'276	80	12'571'410	4	1'232'495	1'669'629	437'134
Singapore	124'895'701	111'967'839	12'927'862	60'664'577	49	55'105'381	-9	-51'303'262	-56'862'458	-5'559'196
Vietnam	57'324'332	34'258'772	23'065'560	42'752'994	75	34'930'880	-18	8'494'222	672'108	-7'822'114

Source: COMTRADE and Gravity Model Estimations Note: Peru and Brunei were dropped from gravity model estimations due to significant gaps in their data.

Predicted DVA exports post TPPA decline in Malaysia by around $17 billion reducing its domestic value added content in exports by 32% of existing DVA exports. This is not surprising if viewed with respect to the declining trend in Malaysia's DVA exports to TPPA12 over the years as elaborated in the earlier section. Decline in DVA exports can have severe employment implications in export sectors. Estimating the implications for BOT, it is found that for Malaysia in 2013, DVA exports minus imports were minus $19 billion. This has a potential to worsen to around minus $37 billion per year. BOT when estimated in terms of DVA exports and imports is found to worsen for all countries except USA, Japan and New Zealand. These three countries will be the net 'gainers' post TPPA in terms of DVA exports.

Given the provisions of TPPA which removes all restrictions to FDI and trade in services, this is not very surprising. Most of the 'value' in manufactured exports come from pre-manufacturing and post-manufacturing services embedded in manufacturing products. Developed countries have competitive advantages in these services and therefore would gain more in terms of DVA exports in any trade agreement with developing countries which include complete services liberalisation[10].

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[10] See Banga (2014) for distribution of gains in GVCs.

7. Implications of Tariff Preferences in TPPA on sector-specific Trade and BOT

7.1 Existing Tariff Profiles of TPPA12 Countries

Although TPPA goes much beyond tariff liberalisation, there is always an interest in examining the sectors which will gain and those which will lose in terms of tariff liberalisation. What is intriguing about TPPA is that all the countries are already in FTAs with most of the TPPA partner countries (Table 3). This is especially true for countries like Chile and Singapore. However, it is important to note that the existing FTAs have 'exclusion lists'. If TPPA aims at a higher scope of tariff liberalisation with smaller scope for excluding tariff lines, it will be important to examine the impact of tariff liberalisation.

Table 3: Existing FTAs among TPPA member countries in 2013

	Australia	Brunei	Canada	Chile	Japan	Malaysia	Mexico	New Zealand	Peru	Singapore	USA	Vietnam
Australia		✓		✓		✓		✓		✓	✓	✓
Brunei	✓			✓	✓	✓		✓		✓		✓
Canada				✓			✓		✓		✓	
Chile	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Japan		✓		✓		✓	✓		✓	✓		✓
Malaysia	✓	✓		✓	✓			✓		✓		✓
Mexico			✓	✓	✓				✓		✓	
New Zealand	✓	✓		✓		✓				✓		
Peru			✓	✓	✓		✓			✓	✓	
Singapore	✓	✓		✓	✓	✓		✓	✓		✓	✓
USA	✓		✓	✓			✓		✓	✓		
Vietnam	✓	✓		✓	✓	✓				✓		

Table 4 reports the existing tariff profiles of TPPA12. It can be seen that the average applied MFN tariffs are quite low for some countries like Singapore and New Zealand. But these could differ widely across sectors. Canada, Malaysia, Mexico and Vietnam have average MFN applied tariff as high as 16% in agriculture sector while Mexico and Vietnam have around 8% applied tariffs in non-agriculture sector.

Table 4: Average Applied MFN Tariffs (%)

	Total	Agriculture	Non-Agriculture
Australia	2.7	1.2	2.9
Brunei	2.5	0.1	2.9
Canada	4.3	16.2	2.4
Chile	6	6	6
Japan	4.6	16.6	2.6
Malaysia	6.5	11.2	5.8
Mexico	7.8	16.1	8.4
New Zealand	2	1.4	2.2
Peru	3.7	4.1	3.6
Singapore	0.2	1.4	0
USA	3.4	4.7	3.2
Vietnam	9.5	16.1	8.4

These variations become even more evident when product level tariffs are observed in some sectors and in some countries. Table 5 provides highest tariffs by product category in TPPA countries. These products include dairy, clothing, beverages, tobacco, sugar and electrical machinery.

Table 5: Highest tariffs by product in TPPA countries

Country	Product	Average Applied MFN Tariffs
Australia	Clothing	8.9
Brunei	Electrical machinery	13.9
Canada	Dairy Products	246.8
Chile	Most Products	6.0
Japan	Dairy Products	178.5
Malaysia	Beverages and Tobacco	119.7
Mexico	Sugar and confectionary	59.3
New Zealand	clothing	9.6
Peru	clothing	13
Singapore	Beverages and tobacco	2.4
USA	Dairy	19.1
Vietnam	Beverages and tobacco	43.6

Source: WTO Tariff profile 2012 and Williams (2013), CRS Report for Congress in USA

7.2 Implications of Tariff liberalisation under TPPA

To estimate the impact of tariff reduction in TPPA12, SMART simulations are used which are based on Partial equilibrium. One of the advantages of this approach is that it allows estimation of tariff reduction at a much disaggregated level, for example, implications of removing tariffs on broken rice (at HS six digit disaggregation). Such a disaggregated product level estimations of tariff liberalisation is not possible in any other model. SMART simulations are appropriate to use for TPPA 12 analysis as only few products have high tariffs in member countries and implications for removing these tariffs on exports, imports, trade creation and trade diversion should be estimated. This also resolves a number of "aggregation biases." However, it needs to be remembered that this result of partial equilibrium analysis applies to only that product/sector and ignores inter-sectoral linkages.

Using SMART simulations, we first estimate the impact of removal of all six digit product level tariffs in TPPA12 countries. Existing applied tariffs are used and all tariffs among TPPA12 countries are brought down to zero. The simulation results are reposted in Table 6. The results show that post tariff liberalisation, Malaysia's exports may rise to TPPA partner countries from $93.7billion to $95.2 billion, but imports will rise from $73.8 billion to $76.8

billion resulting in adverse BOT of around $1.4 billion per annum. Malaysia's BOT post TPPA will deteriorate the most with respect to Japan, followed by USA, Australia and Singapore. Malaysia gains with respect to Vietnam in terms of improving its BOT by $ 460 million.

Table 6: Tariff Liberalization in TPPA 12 post TPPA

	Malaysia's Imports in 2013 (1000 USD)	Malaysia's Exports in 2013 (1000 USD)	BOT in 2013 (1000 USD)	Malaysia's Estimated Imports post TPPA (1000 USD)	Malaysia's Estimated Exports post TPPA(1000 USD)	ESTIMATED BOT Post TPPA (1000 USD)	Estimated Change in BOT of Malaysia Post TPPA (In 1000USD)
Australia	5'241'604	9'259'055	4'017'451	5'490'744	9'265'447	3'774'704	-242'748
Brunei	329'924	821'963	492'039	344'866	847'281	502'415	10'376
Canada	1'001'993	802'325	-199'668	1'029'746	826'391	-203'355	-3'686
Chile	416'529	163'815	-252'714	422'283	185'220	-237'063	15'652
Japan	17'913'423	25'318'759	7'405'337	19'395'128	25'453'784	6'058'656	-1'346'681
Mexico	329'916	1'294'655	964'738	351'549	1'333'137	981'588	16'850
New Zeal:	872'309	1'383'086	510'777	900'841	1'388'237	487'396	-23'381
Peru	75'373	117'571	42'198	77'003	124'805	47'802	5'604
Singapore	25'459'926	31'872'411	6'412'485	25'519'103	31'873'331	6'354'228	-58'257
United St:	16'204'454	18'461'304	2'256'850	16'882'749	18'839'527	1'956'778	-300'073
Vietnam	6'044'023	4'232'394	-1'811'629	6'425'155	5'075'400	-1'349'755	461'874
TPPA11	73'889'475	93'727'339	19'837'864	76'839'166	95'212'561	18'373'395	-1'464'469

To identify the sectors for which the imports will rise the most, sector-wise tariff liberalisation between TPPA12 countries is undertaken. Existing applied tariffs are used in the simulation with rest of the world. Table 7 reports the sector-wise results. Results are reported only for the sectors where imports will rise by more than $10 million because of tariff removal post TPPA. Industries which will face a rise in imports more than $100 million pa are vehicles, followed by iron and steel sector, mineral fuels, plastics and articles, boilers and rubber and articles, aluminium and articles and tobacco. Trade creation implies that as import tariffs reduce in partner countries, varieties of products produced by the partner country becomes cheaper and consumers buy new varieties from partner countries. Trade diversion on the other hand would imply that imports coming from non TPPA countries divert to TPPA partner countries. In vehicles, $470 million will be new imports entering per annum in Malaysian markets post TPPA.

Table 7: Change in Malaysia's Imports Post TPPA: Sector-specific Results of Tariff liberalization

HS CODES	Change in imports Post TPPA from TPPA countries (1000 USD)	Trade creation or New Imports (1000 USD)	Trade Diversion (1000 USD)	Percentage of DVA in Exports
87 -- VEHICLES OTHER THAN RAILWAY OR TRAMWAY ROLLIN	552'533	470'293	-82'240	56
72 -- IRON AND STEEL	496'815	277'627	-219'187	33
73 -- ARTICLES OF IRON OR STEEL	339'385	219'065	-120'320	33
27 -- MINERAL FUELS, MINERAL OILS AND PRODUCTS OF THE	222'243	139'129	-83'113	33
39 -- PLASTICS AND ARTICLES THEREOF	208'164	155'847	-52'317	63
84 -- NUCLEAR REACTORS, BOILERS, MACHINERY AND MECH	181'563	113'688	-67'875	73
85 -- ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS	136'532	85'155	-51'377	48
40 -- RUBBER AND ARTICLES THEREOF	114'364	40'995	-73'368	63
76 -- ALUMINIUM AND ARTICLES THEREOF	110'038	82'532	-27'505	63
24 -- TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTE	106'765	90'983	-15'782	84
70 -- GLASS AND GLASSWARE	64'616	43'616	-20'999	33
71 -- NATURAL OR CULTURED PEARLS, PRECIOUS OR SEMI-PF	62'268	72'325	10'057	33
48 -- PAPER AND PAPERBOARD; ARTICLES OF PAPER PULP, C	61'340	38'545	-22'794	69
10 -- CEREALS	51'228	33'712	-17'516	84
22 -- BEVERAGES, SPIRITS AND VINEGAR	50'610	29'672	-20'939	84
35 -- ALBUMINOIDAL SUBSTANCES; MODIFIED STARCHES; GL	45'322	48'253	2'932	63
32 -- TANNING OR DYEING EXTRACTS; TANNINS AND THEIR [	43'160	36'744	-6'415	63
21 -- MISCELLANEOUS EDIBLE PREPARATIONS	40'472	21'906	-18'567	84
74 -- COPPER AND ARTICLES THEREOF	36'097	23'599	-12'499	33
28 -- INORGANIC CHEMICALS; ORGANIC OR INORGANIC CON	30'646	15'507	-15'139	63
38 -- MISCELLANEOUS CHEMICAL PRODUCTS	26'146	19'266	-6'880	63
83 -- MISCELLANEOUS ARTICLES OF BASE METAL	15'614	10'926	-4'688	33
18 -- COCOA AND COCOA PREPARATIONS	13'624	4'575	-9'049	84
93 -- ARMS AND AMMUNITION; PARTS AND ACCESSORIES TH	12'659	2'457	-10'202	50
82 -- TOOLS, IMPLEMENTS, CUTLERY, SPOONS AND FORKS, C	11'030	8'351	-2'679	33
62 -- ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, N	9'461	2'980	-6'481	77

Note: HS combined codes are reported at 2-digit disaggregation

Table 8 reports the partner TPPA countries from where imports increase into Malaysia in the top importing sectors. We find that most of these imports come from USA and Japan with share of Japan being as high as 97% in rise in imports of vehicles and 90% in iron and steel. US share in increased imports of electrical machinery post TPPA is around 60%.

Table 8: TPPA Partner countries Exporting to Malaysia Post TPPA: Top Sectors

	Imports increase Post TPPA- Share of TPPA partner countries in rising Imports of Malaysia
87 -- VEHICLES OTHER THAN RAILWAY OR TRAMWAY ROLLING STOCK, AND PARTS AND ACCESSORIES THEREOF	Japan (97%)
72 -- IRON AND STEEL	Japan (90%)
	Australia (8%)
73 -- ARTICLES OF IRON OR STEEL	Japan (66%)
	USA (24%)
	Australia (6%)
84 -- NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF	USA(58%)
	Japan (34%)
39 -- PLASTICS AND ARTICLES THEREOF	Japan (44%)
	USA (29%)
	Singapore (16%)
85 -- ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS THEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS, AND PARTS AND ACCESSORIES OF SUCH ARTICLES	USA (61%)
	Japan (31%)

Table 9 reports at further disaggregated level the items of increased imports from Japan post TPPA. New varieties of medium sized cars and small sized cars will enter Malaysian markets from Japan while more specialised electrical machinery would be imported from USA

Table 9: Main Products of Imports post TPPA from USA and Japan at HS 6-Digit

HS code	Product Description	Trade Total Effect (1000 USD)	New Imports or Trade Creation Effect (1000 USD)	Trade Diversion Effect (1000 USD)
Main Items of Imports from Japan				
870323	Medium sized cars	268'509	142'575	125'935
870322	Small sized cars	150'215	128'578	21'637
870421	Trucks, with diesel or semi-diesel e	115'074	60'680	54'394
721030	Flat-rolled products of iron or non-	91'418	67'628	23'790
720918	Flat-rolled products of iron or non-	90'005	56'896	33'109
730419	Casing etc for oil & gas drill, iron n	83'240	54'923	28'318
711590	Other articles of precious metal or c	71'579	62'792	8'787
Main items of Imports from USA				
853710	Boards, panels, consoles, desks, ca	35'490	18'332	17'158
843143	Parts of boring or sinking machiner	27'754	16'648	11'106
854442	nsulated electric conductors, fitted	21'532	12'797	8'735
321511	Printing ink black	21'103	19'130	1'973
853690	Parts for electric motors, generators	20'824	10'361	10'463
350691	Adhesives Based On Rubber or Pla	20'566	19'170	1'396
321519	Printing Ink (Other than Black)	18'983	8'421	10'562
210690	Other food preparation	18'629	9'123	9'505
841480	Other air pumps, air or gas compres	18'347	9'182	9'165
854420	Co-axial cable & other co-axial elect	18'120	6'465	11'655

On the export side, Malaysia's exports rise by around $ 1.4 billion. Malaysia already has an existing FTA with most of the TPPA countries; the only countries Malaysia does not have an FTA with are Canada, Mexico, Peru and USA. While in terms of percentage change in existing exports, post TPPA, Malaysia exports to TPPA partner countries rise the most to? Vietnam followed by Chile, but in terms of share of countries in Malaysia' increased exports, the highest share is of Vietnam followed by USA and Japan (Table 10).

Table 10: Rise in Malaysia's Exports to TPPA Partner countries post TPPA

	Malaysia's Estimated Change in Exports post TPPA (1000 USD)	Percentage Change in Exports pre and Post TPPA	Percentage Share in Increased Exports post TPPA
Australia	6'392	0.1	0.4
Brunei	25'318	3.1	1.7
Canada	24'066	3.0	1.6
Chile	21'405	13.1	1.4
Japan	135'025	0.5	9.1
Mexico	38'482	3.0	2.6
New Zealand	5'151	0.4	0.3
Peru	7'234	6.2	0.5
Singapore	920	0.0	0.1
United States	378'223	2.0	25.5
Vietnam	843'006	19.9	56.8
TPPA11	1'485'222	1.6	100.0

Table 11 reports sectors where Malaysia's exports will rise to Vietnam post TPPA. These include Electrical machinery (particularly in HS 852872, which is Flat Panel Television); vegetable oils (HS 290321- palm oil); Mineral Fuels (HS 271019- other petroleum oils); Organic chemicals (HS 290321- Vinyl Chloride); boilers (HS 841510- air conditioning machines).

Table 11: Rise in Malaysia's Exports to Vietnam post TPPA: Sectoral Analysis

Product Code with Description	Change in Malaysia's Exports to Vietnam post TPPA	Share in Total Change in Exports of Malaysia to Viet...
85 -- ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS THEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS, AND PARTS AND ACCESSORIES OF SUCH ARTICLES	131'217	19.8
15 -- ANIMAL OR VEGETABLE FATS AND OILS AND THEIR CLEAVAGE PRODUCTS; PREPARED EDIBLE FATS; ANIMAL OR VEGETABLE WAXES	80'297	12.1
27 -- MINERAL FUELS, MINERAL OILS AND PRODUCTS OF THEIR DISTILLATION; BITUMINOUS SUBSTANCES; MINERAL WAXES	69'301	10.5
29 -- ORGANIC CHEMICALS	62'684	9.5
84 -- NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF	46'578	7.0
35 -- ALBUMINOIDAL SUBSTANCES; MODIFIED STARCHES; GLUES; ENZYMES	34'665	5.2
39 -- PLASTICS AND ARTICLES THEREOF	26'973	4.1
48 -- PAPER AND PAPERBOARD; ARTICLES OF PAPER PULP, OF PAPER OR OF PAPERBOARD	16'853	2.5
48 -- PAPER AND PAPERBOARD; ARTICLES OF PAPER PULP, OF PAPER OR OF PAPERBOARD	15'818	2.4
	Total	73.1

Since Malaysia does not have any existing FTA with USA, the simulations are undertaken to capture the change in trade between the two countries post TPPA tariff liberalisation. Table 12 reports the sectors where Malaysia has favourable BOT with USA of more than $10 million pa and sectors where it has negative BOT with USA of more than $10 million. It is seen that Malaysia will have a worsening BOT of more than $25 million in with USA in boilers, tobacco, articles of iron and steel, electrical machinery and glass and glassware, plastics. Favourable BOT will appear in textiles and clothing, rubber articles, wood pulp and wood articles and miscellaneous chemicals.

However, it needs to be noted that in textiles and clothing sector, the change in BOT is when all tariffs in USA and Malaysia and all other TPPA12 countries go down to zero and there is no 'yarn forward rule'. Effectively, Malaysia is free to buy its inputs from most competitive global seller.

Table 12: Malaysia's Trade with USA post TPPA

	Change in BOT of Malaysia with US post TPPA (1000 USD)
84 -- NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF	-95'325
24 -- TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTES	-76'736
73 -- ARTICLES OF IRON OR STEEL	-74'267
85 -- ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS THEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS, AND PARTS AND ACCESSORIES OF SUCH ARTICLES	-37'008
70 -- GLASS AND GLASSWARE	-27'357
39 -- PLASTICS AND ARTICLES THEREOF	-25'061
32 -- TANNING OR DYEING EXTRACTS; TANNINS AND THEIR DERIVATIVES; DYES, PIGMENTS AND OTHER COLOURING MATTER; PAINTS AND VARNISHES; PUTTY AND OTHER MASTICS; INKS	-22'661
48 -- PAPER AND PAPERBOARD; ARTICLES OF PAPER PULP, OF PAPER OR OF PAPERBOARD	-21'582
76 -- ALUMINIUM AND ARTICLES THEREOF	-17'583
35 -- ALBUMINOIDAL SUBSTANCES; MODIFIED STARCHES; GLUES; ENZYMES	-13'605
83 -- MISCELLANEOUS ARTICLES OF BASE METAL	-11'698
54 -- MAN-MADE FILAMENTS; STRIP AND THE LIKE OF MAN-MADE TEXTILE MATERIALS	10'396
27 -- MINERAL FUELS, MINERAL OILS AND PRODUCTS OF THEIR DISTILLATION; BITUMINOUS SUBSTANCES; MINERAL WAXES	11'055
23 -- RESIDUES AND WASTE FROM THE FOOD INDUSTRIES; PREPARED ANIMAL FODDER	11'440
44 -- WOOD AND ARTICLES OF WOOD; WOOD CHARCOAL	15'096
38 -- MISCELLANEOUS CHEMICAL PRODUCTS	42'186
47 -- PULP OF WOOD OR OF OTHER FIBROUS CELLULOSIC MATERIAL; RECOVERED (WASTE AND SCRAP) PAPER OR PAPERBOARD	45'349
62 -- ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, NOT KNITTED OR CROCHETED	50'641
40 -- RUBBER AND ARTICLES THEREOF	80'916
61 -- ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, KNITTED OR CROCHETED	88'214

8. Summary and Conclusions

The paper estimates the impact of TPPA on its member countries. Deviating from the existing studies, which largely focus on impact of TPPA on included and excluded countries' trade, the paper estimates its impact on Domestic Value Added trade between TPPA member countries. It is argued that the existing literature on impact analysis of TPPA largely uses Computable General Equilibrium Analysis (CGE) to simulate the impact of TPPA on exports and imports of partner countries, including trade diversion and trade creation, thereby estimating the impact on member countries' GDP, employment and welfare. However, with

the rising importance of global value chains, mega FTAs like TPPA, with liberal provisions on foreign direct investments and trade in services, countries are more likely to increase their imports of inputs which are used in their exports. This would imply that an estimated "rise in exports" by models like CGE, may not be translated into rise in output and employment but may actually be fed by imports from partner countries, declining the existing domestic value-added content of exports of some member countries. This can have adverse implications for domestic production and employment for some of the countries engaged in TPPA. This aspect has been completely ignored by the existing literature. They therefore tend to overestimate the production-linked gains like increase in GDP and employment.

The paper puts forward a further critique of studies using CGE models to assess the impact of TPPA. Some of these studies include Petri et al (2011), PIIE (2012), Cheong (2013), Xin (2014), and Kenichi K. (2011). There is a growing consensus on the limitations of CGE modelling and its unrealistic assumptions which invariably lead to 'over-estimation' of gains, especially for small developing countries. Literature argues that these models are designed in such a manner that liberalization will always lead to increase in 'overall gains' as they use inconsistent and unrealistic assumptions.

Using WTO-OECD Trade in Value Added database, the paper examines the trends in bilateral domestic Value- Added (DVA) exports of Malaysia to TPPA partner countries. The indicator used reflects the net payment which Malaysia receives from its gross exports to partner countries. This is estimated as 'gross exports of Malaysia to partner country minus partner country's foreign value added in Malaysia's gross exports.' It is found that like many other developing countries, Malaysia has been experiencing a fall in its domestic value added content in its exports to the world. This declined from 60% in 1995 to 58% in 2005, after which the domestic value added in exports rose to 62% in 2009. However, unlike its global trend, with respect to other TPPA partner countries, Malaysia's bilateral Value Added Exports has been steadily declining over the years, as foreign value-added from these countries in Malaysia's exports has been rising. This decline has been experienced with respect to all major TPPA members like USA, Mexico, New Zealand, Singapore and Japan. Maximum decline in bilateral value-added exports of Malaysia has been with USA, where it has declined from 65% in 1995 to 42% in 2009. But while Malaysia's bilateral value-added exports to TPPA members have been steadily declining, the TPPA's member countries value -added exports of to Malaysia have been rising.

Using data on bilateral domestic value-added exports and domestic value-added imports of all TPPA member countries, the paper estimates the impact of TPPA12 on Malaysia's domestic value added exports and on its balance of trade. To undertake this analysis, the paper deviates from the existing literature using CGE for impact analysis of TPPA and estimates a dynamic gravity model, using existing bilateral domestic value-added trade of member countries and gravity variables. The results show that predicted DVA exports to TPPA member countries decline in Malaysia by around $17 billion per annum post TPPA, reducing its domestic value added exports to these countries by 32% of existing exports. This is not surprising if viewed with respect to the existing declining trend in Malaysia's bilateral DVA exports to TPPA12. Estimating the implications for BOT, it is found that for Malaysia in 2013, bilateral DVA exports minus imports (Value Added BOT) was minus 19 billion. This has a potential to worsen to around minus $37 billion per year. BOT when estimated in terms of DVA exports and imports is found to worsen for most of the countries except USA, Japan and New Zealand. These three countries will be the net 'gainers' post TPPA in terms of DVA exports. The estimated BOT in DVA for Malaysia worsen significantly with respect to Singapore, Japan and Vietnam.

The impact of tariff liberalisation among TPPA member countries has been estimated using partial equilibrium. WITS SMART simulations are undertaken at HS six-digit disaggregated product level. The sectoral results show that post tariff liberalisation, Malaysia's exports may rise to TPPA partner countries from $93.7billion to $95.2 billion, but imports will also rise from $73.8 billion to $76.8 billion resulting in worsening of Malaysia's BOT of around $1.4 billion/ per annum due to the TPPA. Malaysia's BOT post TPPA will deteriorate the most with respect to Japan, followed by USA, Australia and Singapore. Post tariff liberalisation by all TPPA member countries, imports rise from Japan from $17.9 billion to $ 19.3 billion, leading to a negative change in BOT. New varieties of medium sized cars and small sized cars will enter Malaysian markets from Japan while more specialised electrical machinery would be imported from USA. Malaysia gains with respect to Vietnam in terms of improving its BOT by $ 460 million.

On the export side, Malaysia's exports rise by around $ 1.5 billion. Malaysia already has an existing FTA with most of the TPPA countries; the only countries where FTA does not exist are Canada, Mexico, Peru and USA. While in terms of percentage change in existing exports, Malaysia exports to TPPA partner countries rise the most in Vietnam followed by Chile, but

in terms of share of countries in Malaysia' increased exports, the highest share is of Vietnam followed by USA and Japan. Malaysia's exports will rise to Vietnam post TPPA. These include Electrical machinery (particularly in HS 852872, which is Flat Panel Television); vegetable oils (HS 290321- palm oil); Mineral Fuels (HS 271019- other petroleum oils); Organic chemicals (HS 290321- Vinyl Chloride); boilers (HS 841510- air conditioning machines).

Malaysia does not have any existing FTA with USA. Results show that post TPPA Malaysia will have a unfavourable BOT of more than $25 million per annum with USA each of the following sectors- boilers, tobacco, articles of iron and steel, electrical machinery and glass and glassware, plastics. Malaysia's BOT would improve post TPPA in textiles and clothing, rubber articles, wood pulp and wood articles and miscellaneous chemicals. However, it needs to be noted that in textiles and clothing sector, the change in BOT is when all tariffs in USA and Malaysia and all other TPPA12 countries go down to zero and there is no 'yarn forward rule'. Malaysia is therefore free to buy its inputs from the most competitive global seller.

Overall, the paper argues that any estimation of 'gains' and 'losses' from a trade agreement must take into account the implications for domestic value-addition in exports. If ignored, misleading results may follow. It is wrong to assume that production linked gains from higher exports like gains in terms of increases in GDP and employment will automatically follow. Many developing countries like Malaysia are experiencing a fall in their domestic value added exports and a rise in their imports of inputs which are used by their export sectors. In this scenario, policymakers should focus more on *'producing more for trade'* and not on just *'trading more'*.

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APPENDIX

Table A.1: Snapshot from OECD-WTO TiVA May 2013

Time	2009									
Industry	TOTAL									
Partner	Australia	Canada	Chile	Japan	Mexico	New Zealand	United States	Brunei Darussalam	Singapore	Viet Nam
Country										
Malaysia	1614.5	545.7	220.7	7517.2	275.7	127.7	13586.4	44.5	3417.1	532

Data extracted on 31 Dec 2014 13:17 UTC (GMT) from OECD.Stat

Indicator	Foreign value added content of gross exports									
Time	2008									
Industry	TOTAL									
Partner	Australia	Canada	Chile	Japan	Mexico	New Zealand	United States	Brunei Darussalam	Singapore	Viet Nam
Country										
Malaysia	2226.5	778.3	309.6	9504.5	291	218	15218.9	83	4051.3	673.3

Data extracted on 31 Dec 2014 13:17 UTC (GMT) from OECD.Stat

Indicator	Foreign value added content of gross exports									
Time	2005									
Industry	TOTAL									
Partner	Australia	Canada	Chile	Japan	Mexico	New Zealand	United States	Brunei Darussalam	Singapore	Viet Nam
Country										
Malaysia	1682.8	776.6	210.2	7744.2	171.5	96.7	13503.3	36.2	3314.6	425.7

Indicator	Foreign value added content of gross exports									
Time	2000									
Industry	TOTAL									
Partner	Australia	Canada	Chile	Japan	Mexico	New Zealand	United States	Brunei Darussalam	Singapore	Viet Nam
Country										
Malaysia	1176.2	561	102.5	8313.5	158.4	76.9	11863.9	22.4	2709.8	252.1

Indicator	Foreign value added content of gross exports									
Time	1995									
Industry	TOTAL									
Partner	Australia	Canada	Chile	Japan	Mexico	New Zealand	United States	Brunei Darussalam	Singapore	Viet Nam
Country										
Malaysia	1036.1	277	137	7563	126.7	78.8	6818.8	9.3	1756.5	26.6

Source: OECD-WTO TiVA, May 2013