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# WHO ARE THE WINNERS AND LOSERS IN THE TRANS-PACIFIC PARTNERSHIP (TPP)

Artículo de investigación científica

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## *Resumen*

*Este estudio propone aplicar la metodología de evaluación de liberalización comercial (Metodología-TLE) de Ruiz Estrada (2004) al Acuerdo Transpacífico (TPP) de doce miembros. La metodología TLE ofrece nuevos índices. Hay cuatro fases básicas en la implementación de la metodología TLE. La primera fase es el diseño de una tabla de base de datos de aranceles de entrada múltiple por sector de producción (agricultura, industria pesada 1, industria ligera 2 y servicios) para cada miembro de la PPT. La segunda es la medición del índice de liberalización comercial por sector de producción (αi). Se divide por el índice de liberalización del comercio agrícola (α1), el índice de liberalización del comercio de la industria pesada (α2), el índice de liberalización del comercio de la industria ligera (α3) y el índice de liberalización del comercio de servicios (α4). La tercera fase es la medición del índice de cobertura de liberalización comercial (TLC). La última fase es la medición del índice de la etapa de liberalización comercial (TLS) para cada miembro de la PPT. El objetivo general de aplicar la metodología TLE es evaluar cómo cada miembro de TPP su cobertura y etapa de liberalización comercial. La metodología TLE no pretende ser un modelo de predicción en ningún caso. TLE-Metodología, en efecto, es un esquema simple y flexible, que puede aplicarse a cualquier caso de liberalización comercial en nuestro caso es la TPP doce miembros.*

***Palabras clave:*** *Liberalización del comercio, Comercio Internacional, Metodología-TLE, TPP, Unión Aduanera.*

## Abstract

This study proposes to apply the trade liberalization evaluation methodology (TLE-Methodology) by Ruiz Estrada (2004) to the Trans-Pacific Partnership (TPP) twelve members. The TLE-Methodology offer new indexes. There are four basic phases in the implementation of TLE-Methodology. The first phase is the design of a multi-input tariff database table by production sector (agriculture, heavy industry1, light industry2 and services) for each TPP member. The second is the measurement of the trade liberalization index by production sector (αi). It is divided by the agriculture trade liberalization index (α1), heavy industry trade liberalization index (α2), light industry trade liberalization index (α3), and services trade liberalization index (α4). The third phase is the measurement of the trade liberalization coverage (TLC) Index. The last phase is the measurement of the trade liberalization stage (TLS) index for each TPP member. The general objective to apply the TLE-Methodology is to evaluate how each member of TPP its trade liberalization coverage and stage. The TLE-Methodology is not intended to be a forecasting model in any case. TLE-Methodology, in effect, is a simple and flexible scheme, which can be applied to any case of trade liberalization in our case is the TPP twelve members.

**Keywords:** Trade liberalization, International Trade, TLE-Methodology, TPP, Custom Union

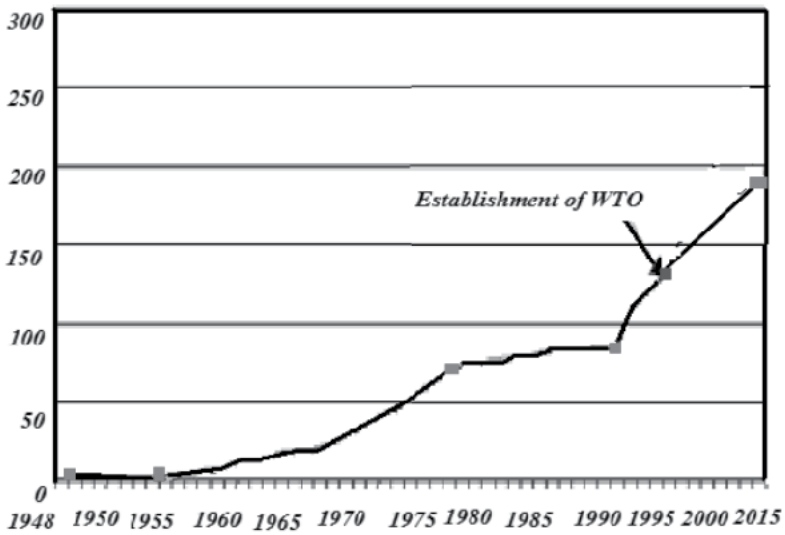
## Introduction

This research paper the literature about multilateralism vs. regionalism is growing among economists regarding the question of whether regional integration arrangements are favorable or non-favorable for the multilateral trade system. According to Bhagwati's (1993b) in phrase, or stepping stones toward multilateralism? Governments and economists are observing the ability of the world trade organization (WTO) to maintain the GATT's unsteady yet distinct momentum toward for a full liberalism, and as they contemplate the emergence of world-scale regional integration arrangements (RIA's). This research paper argues that the GATT/WTO's incapacity to solve trade differences among its members could be rectified through the expansion of large number of regional integration agreements around the world. The regional integration agreements basically are based on two schemes of regional integration, namely customs union and free trade areas.

According to world trade organization (WTO), the fast growth of Regional Integration Agreements around the world was generated between 1992 and 2015 (Figure 1). Around 186 regional integration agreements existing around the world were registered in the GATT/WTO under different status, and up till 2015 around the world. For this reason, many authors in international trade present strong claims in favor of regionalism under a deeper integration which can be applied multilaterally in relation of products, services, subsidies, and dispute issues); that it makes negotiation easier by reducing the number of international trade players in the world trade arena.

According to Bhagwati (1993a) maintain that regionalism reduces the motivation for multilateralism. They have several counter-arguments against the above favorable claims of regionalism. These agreements originated from the fast expansion in the number of regional integration agreements around the world. Further, Krugman (1991) argues in favor of multilateralism and supports the idea that multilateralism brings more benefits to the global international trade than regionalism. He asserts that if the number of custom unions and free trade areas increases, then trade welfare in the world trade will decrease respectively.

**Figure 1:**
**Evolution of Regional Integration Agreement's (RIA's) in the World registered by GATT/WTO (1948-2015)**




Source: World Trade Organization (WTO) Secretariat.

Moreover, two categories of regionalism are applied in this research paper. These two categories of regionalism, there are closed regionalism and open regionalism.

### a. Closed Regionalism

Closed regionalism is based on the import-substitution industrialization strategy or inward oriented model under the infant industry argument. The import-substitution industrialization strategy uses a common import tariff that is a form of government intervention to protect the domestic industries and to create a large market according to Balassa (1985). Closed regionalism has observed a series of phases in the process towards the creation of a single trading bloc. These six phases are (i) the preferential trade arrangements; (ii) free trade area will eliminate internal tariff and non-tariff barriers but not harmonize external barriers; (iii) the customs union, which is trying to remove internal barriers and establish a common external tariff; (iv) the common markets, which is formed by a customs unions and where free mobility of labor (L) and capital (K) are eliminated; (v) the common currency and common economic policies based on an economic and monetary union; (vi) confederation according to Lawrence (1996).

However, disappointing results were obtained by many countries in Latin America, for example, in countries in the Central America Common Market (CACM). These countries experienced high costs, economically, socially and politically. In fact, the application of the import-substitution industrialization strategy gives rise to

problems, such as imbalanced industrial concentration, high cost of production (i.e. non-efficient allocation of factors of production (L,K) in different production sectors such as agriculture, manufacturing, industry and services), as well as problems relating to bureaucratic negotiations among governments.

### b. Open Regionalism

Open regionalism was developed and promoted at the late of the 1980's. Based on the full trade liberalization, it uses the export-led oriented model. Contrary to closed regionalism, open regionalism seeks to eliminate all trade barriers and non-trade barriers in the same region based on a minimal government intervention. This research paper is considering the open regionalism as a negotiating framework consistent with and complementary to GATT/WTO. Therefore, the Trans-Pacific Partnership (TPP) as a new international trade approach for different regions. But, as they point out, 'openness' carries at least two different meanings: openness in terms of non-exclusivity of membership; openness in terms of contributing economically to the process of global liberalization than detracting from it through discrimination. there are two reasons for the success of this new regionalism as the regional integration agreements unsatisfactory performance in terms of multilateralism and its incapacity to dissolve trade differences among its members with the first regionalism.

## 1. The Evaluation of Customs Union and Trade Liberalization Literature Review

The effects of regional integration have been studied by many economists based on the Custom Union theory or trade liberalization literature review. There are two basic concepts in the theoretical framework of international trade, namely trade-creating effect and trade-diverting effect. These two concepts are used by many economists as the general framework of regional integration. According to Viner (1950) argues that where the trade-creating force is predominant, at least one of the custom union players must get more benefits. Where two players receive net benefit together, all members in the union will benefit in different magnitudes respectively.

However, in the initial stages of the custom union exist a high possibility of loses in the short-run; gaining in the long run only if there is diffusion of increased prosperity in the players in the same customs union. Where the trade-diverting effect is relative, at least one of the member countries is bound to be affected negatively. However, in the short run both may be affected severally together. There will be affected negatively to the outside world at large in the long run as well. The main focus of the customs union theory is the markets of goods and services.

Usually, a partial equilibrium is applied in the custom theory and the central objective of this theoretical approach is to probe its impact on the final national income. The second best theory proposed by Lipsey and Lancaster (1997) should

also be mentioned here. These authors apply a general equilibrium to explain the customs union effects on world trade. The contribution of Lipsey and Lancaster on the customs union theory follows the Pareto optimum (worse-off and better-off) which requires the simultaneous fulfillment of all the optimum conditions based on the general economic problem of maximization according to these two authors. Therefore, one function is maximized subject to at least one constraint to facilitate the application of the general equilibrium, which in this case is the utility function. The customs union theory is still used today and continues to be used by many economists around the world.

### 1.a. Trade Liberalization Literature Review

We can observe the fast expansion of trade liberalization under the preferential trade agreements concept that has taken place throughout the world up to our days. In the form of free trade area, the participant countries agree to eliminate the internal tariff barriers but set their external tariffs barriers independently. It is important to remember that the customs union constitutes the type of preferential trade agreements. Custom union differs from free trade area essentially because its members have a common external trade policy.

The study of preferential trade agreements revolves around trade creation and trade diversion effects respectively. This is partly due to the fact that many economists consider these effects to be the fundamental dimension for evaluating trade blocks performance in the short and long run. However, it is of our view that these ways of analysis require considerable transformation for application in the study of trade liberalization issues. The core idea presented here is that the study of trade liberalization should encompass more than one isolated economic or political analysis revolving around one specific issue. However, the literature on trade liberalization can be studied from three different approaches: (i) the political economy approach; (ii) the economic theory approach; (iii) the trade policy approach. In this part of our research paper it is important to mention that work on trade liberalization based on the political economy approach may be grouped into two large areas of study: (i) free trade under the outward oriented strategies or export orientation; (ii) the protectionism based on the inward oriented.

Firstly, in the case of the literature on free trade, the idea receives support from The Wealth of the Nations by Adam Smith (1776) under the ***Laissez Fair*** framework. In the Wealth of the Nations theoretical framework, Adam Smith does not present some analytical or complex model, his contribution is the introduction of a basic theoretical framework based on a system of clear and general ideas to generate the promotion of free trade among nations. Additionally, the classic free trade literature is based on Smith's studies in terms of theoretical detail through to David Ricardo and its theory of comparative advantage.

In this section of our research paper the introduction of the theory of comparative advantage is considered as a strong analytical method to study and support the free trade literature. According to Haberler (1952), the theory of comparative advantage has a strong relationship with opportunity cost theory. The comparative advantage theory is simple and uses the model to understand the behavior of trading between two countries (X,Y) and two goods (A,B), where each good uses one production factor either labor, capital (L,K) or price (with a monetary value –P–). Labor is represented by man-hours and the value of one unit is represented by its price respectively.

Secondly, in contrast to the idea of free trade is the protectionism literature that supports the idea regarding to (i) the accumulation of treasure; (ii) the protection of national wealth; (iii) the achievement of a favorable balance of trade (large exports and small amount of imports); (iv) the protection of local industry; (v) a strong role of the government in the economic activity. Usually, protectionism

literature follows the infant industry argument. At the same time, protectionism literature offers a variety of perspectives based on serial of arguments are: (i) the terms of trade argument by Torrens in 1808; (ii) Infant Industry Argument by Mill in 1848; (iii) Increasing Returns Argument by Graham in 1920; (iv) Wage Difference Argument in 1830; (v) the general theory of employment, interest, and Money by Keynes in 1936.

Free trade literature and protectionism literature offer a general theoretical framework in the understanding about the trade policy behavior among different kinds of thinkers through its different ideas, concepts, theories, and models that try to show the pros and cons of both sides (free trade and protectionism), At the same time, both literatures asses the pro and cons points. All of them have played important roles in the development of new analytical models to generate logical arguments about the impact of free trade. The difference between the political economy and economic theory approach, and the trade policy approach is that the political economy approach creates criteria based on a general theoretical framework explaining two different sides of the trade orientation (free trade vs. Protectionism). The political economy approach takes a more qualitative analytical path.

Trade liberalization using the economic theory approach is basically one that tries to explain the effect of openness from two angles of analysis: microeconomics and macroeconomics. Each focus also applies two types of methods: qualitative (arguments, theories, principles and concepts) and quantitative (econometrics or analytical methods based on mathematical and statistical methods). The studies can be classified by period of time (ex-ante and ex-post) and dimension of analysis: partial equilibrium or static and general equilibrium or dynamic.

All the above economic models of analysis persist in measuring changes in the individual and social welfare based on the risk considerations. This research paper, on the other hand, asserts that the study of trade liberalization should not focus merely on the risk analysis; instead it should take into consideration a series of favorable conditions that the trade liberalization presents in each country in different regions. The difference in the economic theory approach from that of the political economy and trade policy approaches is that economic theory will offer the basic analytical tools to observe the impact of free trade using either qualitative methods or quantitative methods. The economic theory approach is therefore necessary as it provides an important tool to understand free trade and protectionism.

However, in the economic field of research in the study of trade liberalization, attention was placed on three specific areas: (i) economic theory; (ii) political economy; (iii) applied economics. Economic theory is divided into two parts, namely microeconomics and macroeconomics, each of which has a different focus. Some of these focuses are: partial or general (equilibrium), ex-post or ex-antes (time framework), static or dynamic (behavior). Method analysis is either quantitative (econometrics and mathematics) or qualitative (theories or historical data analysis). It is observed that the study of regional integration from the economic perspective mainly centers on macroeconomics applications, quantitative methods, partial equilibrium, ex-antes approach, static models. Besides, these applications are used in the short term in most research.

The common theories, models and theorems used by researchers in the economic field of research in the study of trade liberalization are: (i) International Trade Policy framework; (ii) optimal current area theory; (iii) fiscal federalism theory; (iv) Heckscher-Ohlin model; (v) Kemp and Wan theorem. All these theories, the most important theory applied is the customs union theory (including the Second Best theory). The customs union theory is still used today by many economists to choose between trade creation and trade diversion for evaluating regional integration. However, the static analysis

used in the customs union theory poses a problem: it frequently uses a partial competitive equilibrium framework to arrive at a general conclusion about a process that is a general equilibrium phenomenon (Devlin and Ffrench-Davis, 1998).

According to Winters (1997), many economists are of the stand that trade creation versus trade diversion is not the core of the problem. The problem lies with the deficiency of the models of dynamics and empirical foundations used for testing them. In effect, Mordechai and Plummer (2002) point out that, economists whose research into regional integration is based on ex-post models include a gravity model, an import-growth simulation and other regression approaches. This is because computational general equilibrium model has become very popular among economists.

Furthermore, the economic field of research merely applies the individual and social welfare gains and losses associated with trade liberalization; it provides no explanations of the economic or political choices that allow for integrated fields of research. As such, the economic field of research negates the global context of the evolution and trend of trade liberalization process as a whole.

However, we are interested to present an alternative model of analysis is oriented to monitoring the behavior of Free Trade Agreements from a new perspective. It is entitled "Trade Liberalization Evaluation (TLE) Methodology. (Ruiz Estrada, 2004)" It is based on the application of a group of indexes and graphs. The group of indexes and graphs can show the trend and stages of any free trade area. The aim of TLE Methodology is to offer to policy-makers and researchers a new alternative analytical tool to evaluate the possibility to start possible negotiations with future partners in the same region or different region (Ruiz Estrada, 2011). At the same time, this evaluation system can generate alternative programs and policies to improving the negotiation of FTAs among different countries.

## 2. An Introduction to the Trans-Pacific Partnership (TPP)

In this research, open regionalism plays a crucial role in resolving the central problem of the contemporary trade policy viz. how to achieve compatibility between the fast expansion of closed regional trade blocs around the world such as ASEAN, NAFTA, and MERCOSUR. Open regionalism, a core principle of the TPP guarantees open membership under multilateral arrangements with fair and clear rules for all members without any discrimination (Bergsten, 1997). The TPP is literally a trade agreement that sets out to harmonize and create a seamless trade and investment environment by promoting transparency of commonly-agreed laws and regulations among twelve Pacific Rim countries namely Australia, Brunei, Canada, Chile, Malaysia, Mexico, New Zealand, Peru, United States of America, Singapore, Japan and Vietnam. These countries registered a Gross Domestic Product (GDP) of over US$56 trillion in the year 2015, which represents about 55% of global international trade.

In light of the economic strength of this regional bloc and the wide ranging regulatory and legal dimensions of the 30 chapters that make up the TPP agreement, which encompass everything from financial services, intellectual property rights, sanitary standards for food, market access and so on, makes the TPP a giant free trade deal of unprecedented scope and ambition that sets the platform for "high standard" trade deals through the elimination of tariffs on goods and services, removal of non-tariff barriers, harmonizes all sorts of regulations and upholds an unconditional "most favored nation" (MFN) treatment among its members. This parallel relationship of members on which the TPP is created serves as a powerful incentive to generate a strong trade exchange and dynamic mobility of investment and will help create new opportunities and provide a more predictable and transparent regulatory environment. The TPP was signed in Auckland, New Zealand in February

2016 after seven years of negotiations. It was designed to achieve a full free open trade and investment in the Pacific Rim by the year 2020 and, which will permit the admission of other members in future. Hence, members of the TPP would embark on the gradual removal of trade barriers in line with the goals of the WTO to promote the principle of multilateralism and open regionalism.

The path to trans-regional free trade scheme was defined consistently as having the traditional concept of open regionalism as its main institutional driving force. As such, the concept of open regionalism helps to shape the practices of trade liberalization in the Pacific Rim. This translates to the emphasis laid by the TPP members on the role of concerned trans-national liberalization under the principle of trade facilitation. Trade facilitation as incorporated in the trans-regional trade liberalization scheme provides benefits to participants yet, with no restrictions to outsiders though, some trade facilitation measures confer benefits on outsiders while others do not. The public sector (government) and private sector (firms) play a crucial role in supporting the trans-regional trade scheme expansion in the Pacific Rim. The recent proliferations of intra-regional arrangements such as NAFTA, MERCOSUR, and ASEAN have the potential to marginalize trans-regional arrangements and hence, generate certain problems in the production specialization and distribution efficiency.

According to Calb and Henderson (1994), the origins of open regionalism is based on the concept of "market integration" around institutional and legal barriers to the international trade, which involves capital movements and other forms of more open economic integration schemes. The market integration has remained primarily the free and active avenue for interaction among firms acting separately from national government policies, and where official encouragement of trans-regional integration does not include major elements of food security, technological des-centralization, investment diversion, and jobs diversion. Following Garnaut (1994), open regionalism is divided in three dimensions:

(i) The first dimension deals with the reduction of non-discriminatory rules from high-income countries to middle and low-income countries in the same trade bloc.

(ii) The second dimension promotes better control and reduction of public goods by governments to generate the easy access of private goods more efficiently and less intervention without any element of discrimination in official barriers.

(iii) The third dimension deals with market integration adaptability and reduction of large bureaucracy through the removal of official barriers to maximize profit patterns of trade for firms in the same trade bloc in the short and long run.

## 3. Trade Liberalization Evaluation Methodology (TLE-Methodology)

The trade liberalization evaluation methodology (TLE-Methodology) by Ruiz Estrada (2004) is a measuring tool for studying regional integration from a global perspective. The proposed trade liberalization evaluation methodology (TLE-Methodology) is a simple and flexible model. It applies dynamic and general equilibrium analysis to show the past and present situations in the trade liberalization process of any country based on a set of indexes. The application of the TLE-Methodology is also based upon the characteristics, conditions and historical moments that any country presents in its trade liberalization development. In its application, TLE-Methodology is like a simulator that allows the application of a series of simulations in different scenarios and in the different phases of the trade liberalization process of any country. This model does not try at any time to be a

forecasting model. It is focused upon showing the past and present situation in a free trade area process as a whole. It can help to provide a general idea about the situations and evolution of the trade liberalization process of any country.

## 4. Trade Liberalization Evaluation (TLE) Methodology: Model

The trade liberalization evaluation methodology (TLE-Methodology) by Ruiz Estrada (2004) is a measuring tool for studying regional integration from a global perspect

### 4.1 Phase I: Design of the Multi-Input Tariff Database Table

The multi-input tariff database Table is a new style of analysis framework that permits storage of a large amount of data to measure a single variable. This single variable can show the evolution of any phenomenon from a global perspective. The multi-input tariff database Table is designed to evaluate two countries or many countries simultaneously. The country multi-input database Table pertains to "country". It uses "n" number of variables. The number 'n' is decided by the researchers or policy-makers. The number of cases in the study is represented by "m". In the case of TLE-Methodology, "m" represents one country. The time factor "t" is dependant upon the time parameters that the researchers or policy-makers are interested in using. Therefore, "t" can be in terms of years or decades (Ruiz Estrada, 2004).

### 4.2. Phase II: Measurement of the Trade Liberalization Index by Production Sector (αi)

The second phase of the implementation of the trade liberalization evaluation methodology (TLE-Methodology) involves the measurement of the trade liberalization index by production sector (αi) using the variables in four basic multi-input tariff database tables. The trade liberalization evaluation methodology (TLE-Methodology) indexes are agriculture trade liberalization index (α1), heavy industry trade liberalization index (α2), light industry trade liberalization index (α3), and services trade liberalization index (α4). These variables (tariff and non-tariff barriers) are analyzed with their codes, descriptions and parameters respectively. The parameters are divided into two categories. The categories are: tariff barriers rate based on limits (e.g. we have tariff rate acceptable (TRA) and actual tariff rate (ATR), if ATR is large than TRA, then it is equal to 0, but if ATR is equal or less than TRA, then it is equal to 1) and non-tariff barriers analysis based on the existence or non-existence of non-tariff barriers) (e.g. an attempt is made to prove the following: if the non-tariff barriers exist, then it is equal to 0; if non-tariff barriers do not exist, it is equal to 1.)

The number of variables used in the TLE Methodology varies, depending on the objectives of the researchers or policy-makers and the orientation research. In the case of the present study, 40 items from the tariff manual of each country under analysis with their respective parameters were selected: 10 items for Agriculture Trade Liberalization Index (α1); 10 items for heavy industry trade liberalization Index (α2); 10 items for Light industry trade liberalization index (α3) and 10 items for services trade liberalization index (α4). Once the number of variables is determined, the next step is to collect the statistical and historical data that constitutes the variables. Variables in each multi-input tariff database Table may not have a direct relationship among them, they may be dependent variables or exogenous variables. However, all the variables in each multi-input tariff database Table are meant to measure a single general variable, that is, each of the trade liberalization index by production sector (αi).

Each of the four trade liberalization indexes by production sector (αi) by sector to be measured is viewed as a dependent variable (i.e. exogenous variable). However, there is no connection and interdependency among these four trade

liberalization indexes by production sector (αi) when they are joined in the Figure. These four trade liberalization indexes by production sector (αi) are used to draw a Figure that represents the evolution and stages of the regional integration process of the region from a global perspective. The objective of this study is to apply the TLE-Methodology to the case of the trade liberalization trend and stage between developing and developed country (Ruiz Estrada, 2004).

#### 4.2.1 Steps to Obtain Each Trade Liberalization Index by Production Sector (αi)

The next step is to add up the values of all variables in the column of the actual situation (AS) in each multi-input tariff database Table. The total possible results (TPR) obtained is then located in the TPR column next to AS column. With TPR in place, the next step is to compute each trade liberalization index by production sector (αi). The computation is done by applying expression (1) to the values in the multi-input tariff database Tables.

$$\Sigma\alpha_i = \Sigma AS_i \times 100 / \Sigma TPR_i \quad (1)$$

$$i = 1$$

Following the above four steps, the fifth step is the plotting of a Figure: (a) the trade liberalization index by production sector (αi) diagram (see Figure 1).

### 4.3 Introduction to Analysis of TLC Index and TLS Index Based on Trade Liberalization Index by Production Sector (αi)

Each trade liberalization index by production sector (αi) plays an important role in the measurement of the trade liberalization coverage (TLC) index and the trade liberalization stage (TLS) index. These two indexes can be affected by any change in the αi indexes in the short and long term. The liberalization index by production sector (αi) may reflect one of two different scenarios. First, if some or all-trade liberalization indexes (agriculture, heavy industry, light industry and services) increase, then TLC index and TLS index may increase. The second scenario is, if some or all-trade liberalization indexes by production sector (agriculture, heavy industry, light industry and services) decrease, then the TLC index and TLS index may decrease (Ruiz Estrada, 2004).

### 4.4 Phase III: Measurement of the Trade Liberalization Coverage (TLC) Index

The third phase of the implementation of the trade liberalization evaluation methodology (TLE-Methodology) Model presents a general definition of trade liberalization coverage (TLC) index. The TLC index is an indicator to compare different trends of the trade liberalization process in any country. It is based on

the trade liberalization index by production sector (αi) of a country. Therefore, the TLC index is a means of analyzing the evolution of any trade liberalization process from a global perspective (Ruiz Estrada, 2004).

### 4.4.1 Steps to Obtain the TLC Index

The first step is to plot each (αi) index: agriculture trade liberalization index (α1), heavy industry trade liberalization index (α2), light industry trade liberalization index (α3) and services trade liberalization index (α4) on the Cartesian plane. It should be noted that the TLC index value (single percentage) is an approximation of the past and present situations that any trade bloc may encounter in the evolution of its trade liberalization. The TLC index is the summation of all the four trade liberalization indexes by production sector (αi). The second step is to plot the TLC Figure based on the total value of the four trade liberalization indexes by production sector (αi). This is followed by calculation of the trade liberalization coverage (TLC) index based on expression (2). It should be noted that the values of the αi indexes are independent of one another. The TLC graph consists of four different areas, where each area has a limit equivalent to 0.25. The total value of these four areas is equal to 1 as observed in the expression (2.6.) Each axis of Figure 2 is either the base or the height of the Figure (represented by β and λ respectively in the Figure 2).

The TLC1 uses the result of the production sector α1 which is equal to β1, and the production sector α2 which is equal to β1, followed by the application of (2.1.) The same steps and expression are used for TLC1, TLC2, TLC3 and TLC4 (See Figure 2). The total TLC index for this period is the sum of all the TLC's. This is depicted in expression (2.5.) The total area is divided from four dissimilar triangles each of area equal to {Base (=βi) x Height (=λi)}/2. Therefore, the triangles areas have to be summed to derive the total surface area (see expression 2.5.)

$$\sum_{i=1}^{4} RD_i = \sum_{i=1}^{4} \{\text{Base } (=\alpha_i) \times \text{Height } (=\lambda_i)\}/2 \quad (2)$$

$$[\beta_1 = \lambda_4]: \gamma_1 = \{\alpha_1(=\beta_1) \times \alpha_2(=\lambda_1)\}/2 \quad (2.1)$$

$$[\beta_2 = \lambda_1]: \gamma_2 = \{\alpha_2(=\beta_2) \times \alpha_3(=\lambda_2)\}/2 \quad (2.2)$$

$$[\beta_3 = \lambda_2]: \gamma_3 = \{\alpha_3(=\beta_3) \times \alpha_4(=\lambda_3)\}/2 \quad (2.3)$$

$$[\beta_4 = \lambda_3]: \gamma_4 = \{\alpha_4(=\beta_4) \times \alpha_1(=\lambda_4)\}/2 \quad (2.4)$$

$$\gamma = \gamma_1 + \gamma_2 + \gamma_3 + \gamma_4 \quad (2.5)$$

$\beta$= Base $\lambda$= Height

We have applied the same concept as regional integration evaluation (RIE-Methodology) (Park and Ruiz Estrada, 2010) to apply this formula to measure the area of the four sides of the figure on the horizontal plane (Ruiz Estrada, 2004).

### 4.4.2 Analysis of TLC Index

The analysis of the TLC index is based on the comparison of two periods or countries. In the case of this study, two periods (i.e. first period and second period) are compared. The total TLC index may present three possible scenarios, namely:

(a) The trade liberalization coverage (TLC' first period < TLC'' second period)

(b) The trade liberalization coverage (TLC' first period = TLC'' second period)

(c) The trade liberalization converage (TLC' first period > TLC'' second period)

In terms of time-span, the TLC index can be measured and compared on a yearly basis, five-yearly basis, and by decades. For this research, the time-span is one decade (the 1990s), which can later be compared. In terms of space, the TLC index can be measured and compared in relation to countries or regions. At any historical moment, the regional integration process in any region is based on the comparison of the size of the trade liberalization coverage (TLC) index (Ruiz Estrada, 2004).

## 4.5 Phase IV: Measurement of the Trade Liberalization Stage (TLS) Index

The last phase in the implementation of the trade liberalization stage (TLS) Methodology is the measurement of the trade liberalization stage (TLS). The TLS index measures the degree of the trade liberalization that any country achieves in the different stages of its evolution. The TLS index is considered a dependent variable in the TLE Methodology. In the measurement of the TLS index, four trade liberalization indexes by production sector ($\alpha i$) are used: agriculture trade liberalization index ($\alpha 1$), heavy industry trade liberalization index ($\alpha 2$), light industry trade liberalization index ($\alpha 3$) and services trade liberalization index ($\alpha 4$). A constant coefficient, focal trade policy approach incline (FTP-Approach Incline) is also used concurrently. The FTP-approach incline is represented by a, b, c, and d in expression (3) and is applied to each trade liberalization index by production sector ($\alpha i$). Each FTP-approach incline (a, b, c, or d) has a limit that is equal to 1 [Refer to expression (3)]. The sum of the FTP-approach incline cannot be more than 1 (Ruiz Estrada, 2004). The application of the FTP-approach incline is twofold.

The first application is the FTP-approach incline Homogeneous Interest. In this application, each FTP-approach incline has the same stage of importance in the analysis [refer to expression (3.1)]. The second application is the FTP-approach incline. There are four possibilities in this application: agriculture trade liberalization approach incline (3.2.), heavy industry liberalization approach incline (3.3.), light industry trade liberalization approach incline (3.4.) and services trade liberalization approach incline (3.5.)

### 4.5.1 Analysis of TLS Index

After the type of FTP-approach incline to be applied is determined, the trade liberalization stage (TLS) index is measured according to expression (3). The TLS index analysis may reveal one of three different scenarios, namely:

(a) The trade liberalization under-developed stage 1 ($0 \leq TLS \leq 0.33$)

(b) The trade liberalization developing stage 2 ($0.34 \leq TLS \leq 0.66$)

(c) The trade liberalization developed stage 3 ($0.67 \leq TLS \leq 1$).

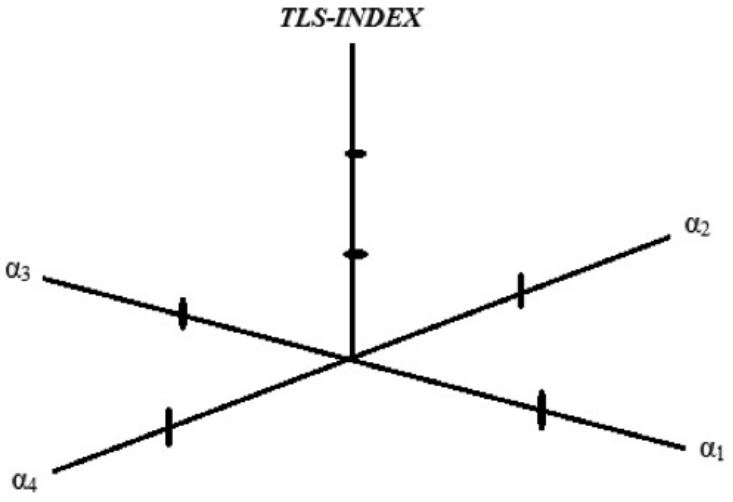
The analysis of the TLS index can provide a general idea or approximation of the stage of regional integration achieved in any region through time and space. The following is a suggested combination of the application of the FTP-approach incline in the measurement of the TLS index:

$$Y = TLS = a\alpha_1 + b\alpha_2 + c\alpha_3 + d\alpha_4 \leq 1 \qquad (3)$$

| | |
|---|---|
| a = 0.25, b = 0.25, c = 0.25, d = 0.25 = 1 => | FTP Homogeneous (3.1) |
| a = 0.40, b = 0.20, c= 0.20, d = 0.20 = 1 => | FTP Agriculture Approach Inclined (3.2) |
| a = 0.20, b = 0.40, c = 0.20, d = 0.20 = 1 => | FTP Heavy Industry Approach Inclined (3.3) |
| a = 0.20, b = 0.20, c = 0.40, d = 0.20 = 1 => | FTP Light Industry Approach Inclined (3.4) |
| a = 0.20, b = 0.20, c = 0.20, d = 0.40 = 1 => | FTP Services Approach Inclined (3.5) |

It must be highlighted that the above combination represents only several of many possibilities or permutations. This should draw attention to the flexibility of the TLS index in adapting to any situation or chosen policy mode. The TLS index presents an approximation of the development stage of trade liberalization concurrently based on a new concept of graphic representation (see Figure 2). This new concept of graphic representation consists of five axes, each of which has a positive value, (in the case of this research, the value in each axis is represented by a percentage).

**Figure 2:**
**The Trade Liberalization Stage (TLS) Mapping**




Source: Author

Once the axes of the Figure 2 are in place, the next step is to plot the four αi indexes (agriculture, heavy industry, light industry, and services αi indexes) in four of the axes respectively. These αi indexes are independent variables. The total value of the four axes is equal to 1 (see Figure 2). The fifth axis, which is represented by Y and positioned in the center of the Figure (among the other four axes) represents the dependent variable TLS index. This fifth axis is the convergent point of all the other four axes or more precisely, the four areas –agriculture, heavy industry, light industry and services– of trade liberalization stage index (αi). The TLS index (Y) is depicted as follows in expression (4).

$$TLS = F(\alpha_1, \alpha_2, \alpha_3, \alpha_4) \leq 1 \qquad (4)$$

## 5. Application of TLE-Methodology in TPP

For the research in this research paper, the TLE-Methodology was applied to 12 different countries (Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, United States, and Vietnam) from TPP between 2005 and 2015. This period of time was chosen because the general objective of TLE-Methodology is calculating the TLC-Index and TLS-Index to observe the link between the trade liberalization stage of each member from TPP and the trans-regional integration performance together in the short term in this specific period of time. In the case to apply TLE-Methodology on trade liberalization to compare twelve TPP members' trade liberalization stages individually, we assume that open regionalism under the trans-regional integration scheme is a suitable

integration scheme for all TPP members, perhaps this new trade liberalization scheme is new, but we are interested if this new regional integration has something different from closed regionalism.

### 5.1 Application of TLE-Methodology in the Trans-Pacific Partnership (TPP)

The results of the correlation between trade liberalization stage (TLS-Index) and income growth rate (ΔY) among 12 members from TPP (equal to 100% of cases) classified into low, middle and high income countries. They show in the majority of high income countries, that is, 60% of cases (Australia, New Zealand, Singapore, United States, Canada, Brunei, Japan) and few number of middle income countries, that is 32% of cases (Malaysia, Peru, Mexico, Chile), Income Growth was highly dependent on the Trade Liberalization stage (TLS-Index) between 2005 and 2015 (see Table 1).

For the rest of the countries in the analysis, there was no correlation between Trade Liberalization stage (TLS-Index) and Income Growth rate (ΔY) shows that a few high income countries 50% of cases (Australia, Singapore, New Zealand, Japan, Brunei, Canada), a large number of middle and low income countries (around 100% of cases between 2005 and 2015). Even countries such as Singapore, Brunei and Chile (See Figure 2), whose stage of trade liberalization stage (TLS-Index) were high, it did not show any correlation between TLS-Index and income growth rate (ΔY). These results suggest that, for all middle income countries and for all low income countries. Trade liberalization coverage (TLC-Index) and trade liberalization stage (TLS-Index) cannot generate income growth in the short term.

In terms of the degree of trade liberalization coverage (TLC-Index) by production sectors (αi), it is observed that for U.S.A. (Figure 8), agriculture trade liberalization index (α1) and heavy industry trade liberalization index (α2) was low in the period 2005-2015. Such low stage of trade liberalization coverage (TLC-Index) can be attributed to the high stage of trade protectionism in the form of non-tariff barriers that the U.S. government imposed on foreign trading partners. The U.S., however, showed high a stage of trade liberalization coverage (TLC-Index) in the light industry trade liberalization index (α3) and services trade liberalization index (α4) during the same period of analysis. The low performance of the Trade Liberalization Coverage (TLC-Index) of U.S. is originates from the high protectionism of the agriculture trade liberalization index (α1) and heavy industry trade liberalization index (α2).

It can be observed that Singapore (see Table 1) had a negative income growth rate (ΔY) between 2005 and 2015. The reason for this negative value in the income growth rate (ΔY) of Singapore (see Figure 7), it is the possibility of different proportions in the growth between trade liberalization stage (TLS-Index) and income growth rates, in the case of countries with high stage of trade liberalization coverage (TLC-Index). However, during this period, Singapore saw negative values in the income growth rate (ΔY). The same situation, high stage of trade liberalization coverage (TLC-Index) but low stage of income growth is observed in the cases of middle income countries (e.g. Malaysia –Figure 5–, Chile –Figure 4–, Mexico –Figure 6–, Peru –Figure 7–) and low income countries (e.g. Vietnam –Figure 8–) (See Table 1).

The Application of the TLE-Methodology to highest income countries (e.g. Australia –Figure 1–, Singapore –Figure 7–, New Zealand –Figure 6–, Japan –Figure 5–, Brunei –Figure 3–, Canada –Figure 4–) shows that these countries had high stage of trade liberalization coverage (TLC-Index) in the light industry trade liberalization index (α3) and services trade liberalization index (α4). It is understood that their agriculture trade liberalization index (α1) and heavy industry trade liberalization index (α2) were under high stage of trade protectionism, compared to middle and low income stage countries. During the same period, middle income countries (e.g. Malaysia –Figure 5–,

Peru –Figure 7–, Mexico –Figure 6–, and Chile –Figure 4–) presented different results of trade liberalization coverage (TLC-Index) by production sector from those of high income countries. In middle income countries, the agriculture trade liberalization index (α1) and light industry trade liberalization index (α2) had low trade liberalization stage (TLS-Index), but the heavy industry trade liberalization index (α3) and services sectors maintain a high stage of trade protectionism. These countries saw an increasing trade liberalization coverage (TLC-Index) but proportional growth across production sectors in their harmonization of trade liberalization coverage (TLC-Index). Among middle income countries, none showed a correlation between trade liberalization coverage (TLC-Index) and income growth rate (ΔY).

In low income countries (Vietnam –Figure 8–) between 2005 and 2015, the agriculture trade liberalization index (α1) was under a high stage of trade protectionism, but the light industry trade liberalization index (α3 heavy industry trade liberalization index (α2), and services trade liberalization index (α4) presented a higher stage of trade liberalization coverage (TLC-Index) compared to high and middle income countries. On the other hand, both their trade liberalization stage (TLS-Index) and trade liberalization coverage (TLC-Index) appeared to be low. The low stage of trade liberalization stage (TLS-Index) and ΔY in low income countries were due to a low stage of participation in world trade on the part of these countries. Amongst low income countries none showed a correlation between trade liberalization stage (TLS-Index) and income growth rate (ΔY) in its economy between 2005 and 2015.

### 5.2 Findings Pertaining to Regional Integration

The results between trade liberalization stage (TLS-Index) and income growth rate (ΔY) in Figure 1 provide a means for comparing the performance of the open regionalism and the closed regionalism in terms of trade liberalization stage (TLS-Index). The results provide a good indication of whether trade liberalization stage (TLS-Index) under a certain regional integration scheme generates desirable income growth rate (ΔY) which determine the success of the scheme.

The application of the TLE-Methodology to the open regionalism under the trans-regional integration scheme reveals a trade liberalization stage (TLS-Index) of 5 and a positive income growth rate (ΔY) of 3. For the closed regionalism under the free trade area (FTA) Scheme, North America Free Trade Areas (NAFTA) recorded a trade liberalization stage (TLS-Index) of 3 -- the highest among all trade blocs under the same scheme, and an income growth rate of 2. These two results show that NAFTA had a higher stage of trade liberalization stage (TLS-Index) but a lower stage of income growth rate (ΔY) for Mexico –Figure 6– and Canada –Figure 4– compared to the U.S. –Figure 8–. In other words, the results indicate that closed regionalism cannot yield as much income growth rate (ΔY) as open regionalism even with their higher stage of trade liberalization stage (TLS-Index).

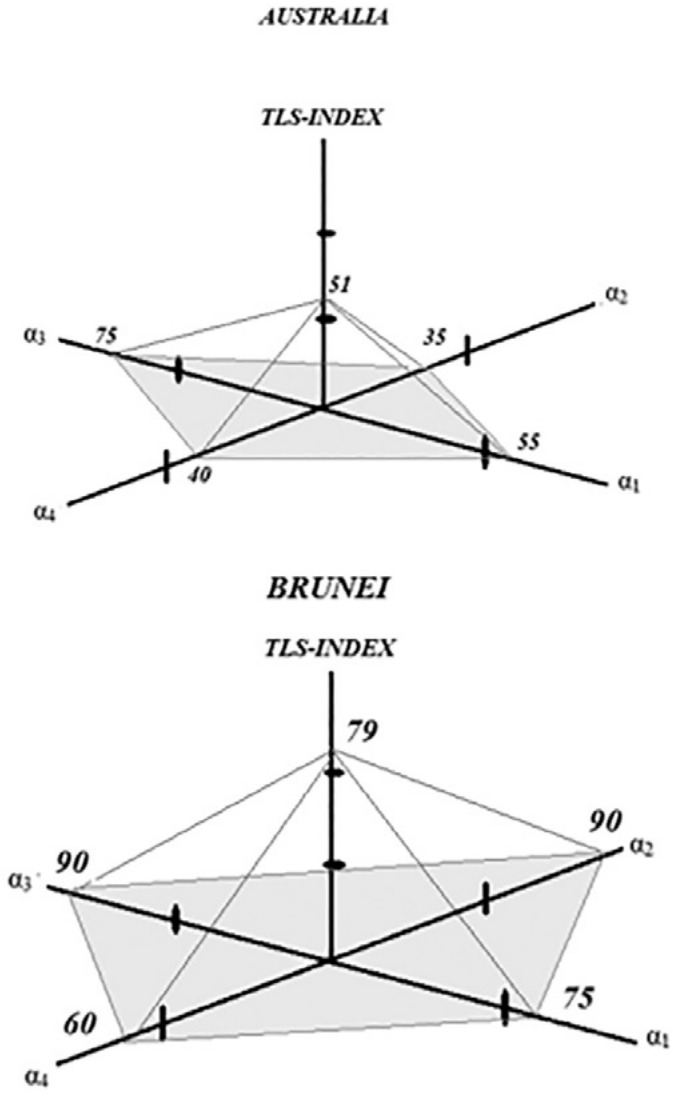
The rest of the trading blocs analyzed were the Association of South East Nations (ASEAN), the Australia-New Zealand Free Trade Area (ANZFTA), all of which are under the closed regionalism scheme. ASEAN had the highest trade liberalization stage (TLS-Index) of 3 and negative income growth rate (ΔY) of -1. ANZFTA, with its income growth rate (ΔY) of –0.4, showed the same high trade liberalization stage (TLS-Index) of 3 as that of ASEAN. In contrast to the results obtained for TPP members (under the open regionalism scheme), the results for NAFTA, ASEAN, and ANZFTA (under the closed regionalism scheme) constitute yet another ground for the claim in this research paper that the trans-regional scheme under open regionalism can generate more income growth than the closed regionalism scheme. Equally important, all the above results testify the viability of the TLE-Methodology as an alternative analytical tool to analyze regional integration.

**Table 1:**
**Calculation of TLS-Index**

| Country | α1 | α2 | α3 | α4 | R1 | R2 | R3 | R4 | TLS | L |
|---|---|---|---|---|---|---|---|---|---|---|
| Singapore | 98 | 90 | 99 | 35 | 25 | 23 | 25 | 9 | 81 | L1 |
| Brunei | 75 | 90 | 90 | 60 | 19 | 23 | 23 | 15 | 79 | L1 |
| New Zealand | 50 | 80 | 90 | 40 | 13 | 20 | 23 | 10 | 65 | L2 |
| Canada | 55 | 60 | 85 | 40 | 14 | 15 | 21 | 10 | 60 | L2 |
| Australia | 55 | 35 | 75 | 40 | 14 | 9 | 19 | 10 | 51 | L2 |
| Malaysia | 50 | 60 | 40 | 35 | 13 | 15 | 10 | 9 | 46 | L2 |
| U.S. | 40 | 35 | 85 | 30 | 10 | 9 | 21 | 8 | 48 | L2 |
| Mexico | 40 | 65 | 40 | 40 | 10 | 16 | 10 | 10 | 46 | L2 |
| Vietnam | 25 | 85 | 20 | 40 | 6 | 21 | 5 | 10 | 43 | L2 |
| Peru | 25 | 70 | 30 | 35 | 6.3 | 18 | 8 | 9 | 40 | L2 |
| Chile | 35 | 50 | 40 | 30 | 8.8 | 13 | 10 | 7.5 | 39 | L2 |
| Japan | 45 | 20 | 35 | 25 | 11 | 5 | 9 | 6 | 31 | L2 |

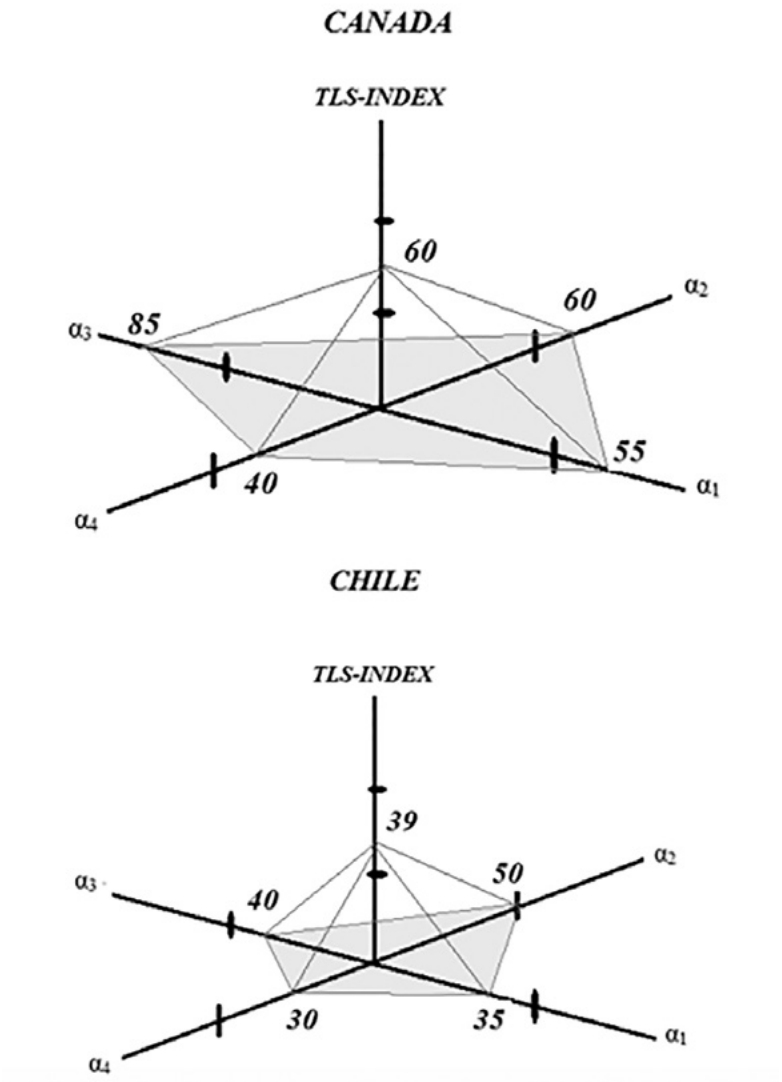
Source: WTO

**Figure 3:**
**TLC-Index and TLS-Index for Australia and Brunei**



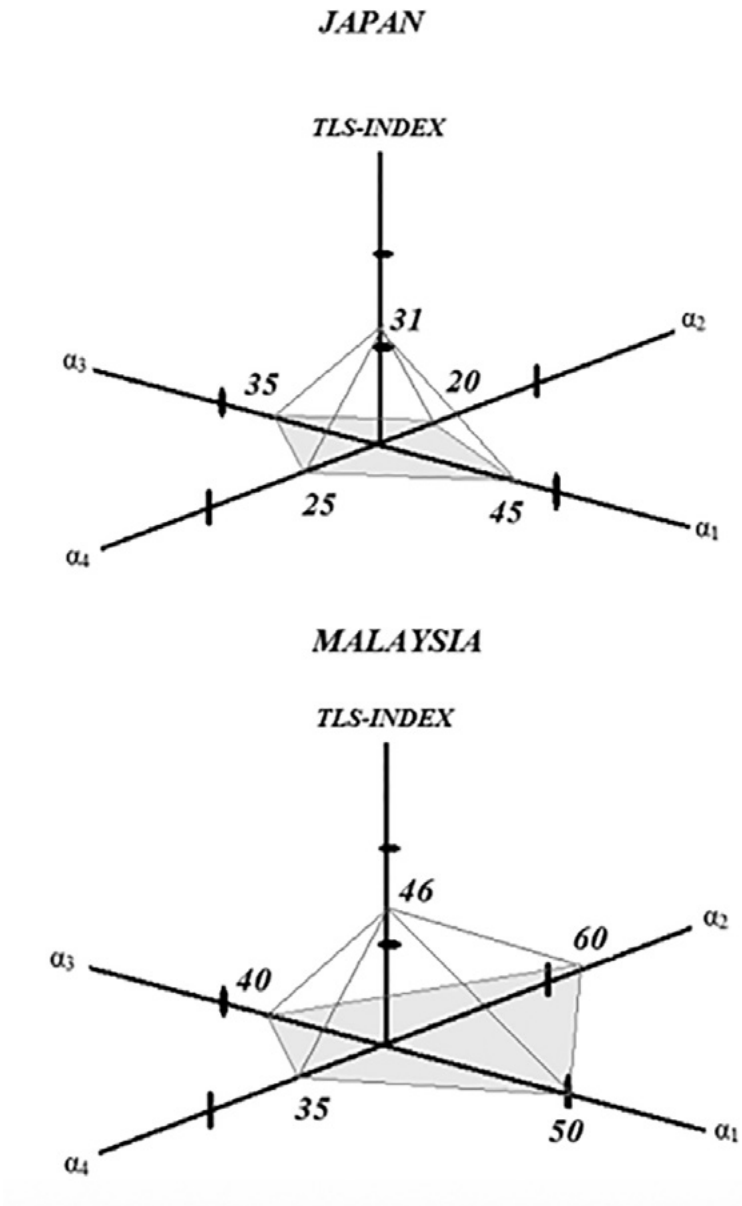

Source: WTO

**Figure 4:**
**TLC-Index and TLS-Index for Canada and Chile**



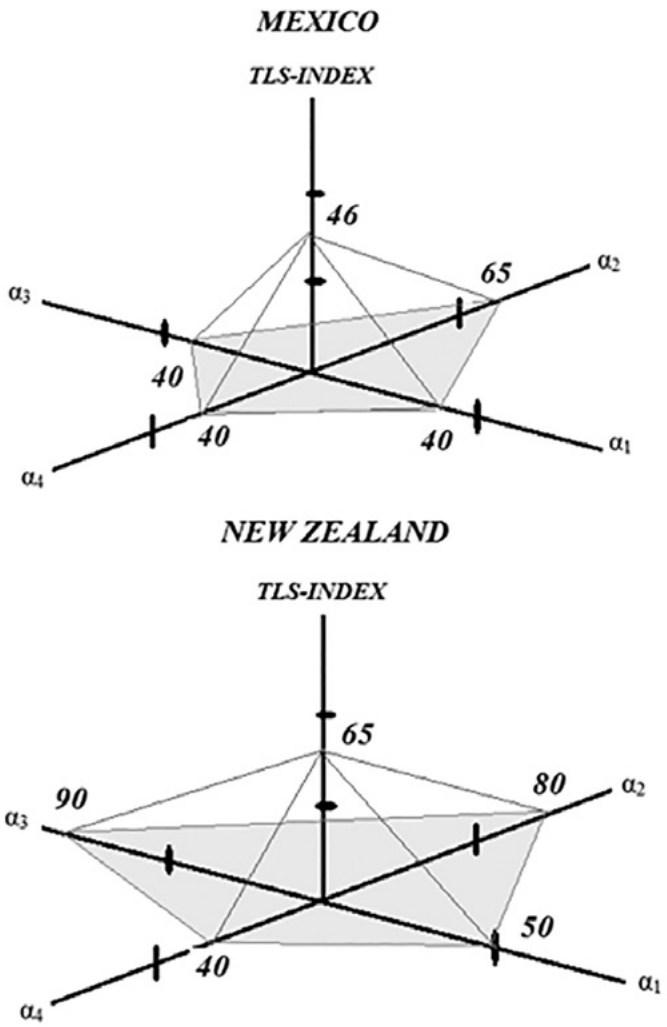

Source: WTO

**Figure 5:**
**TLC-Index and TLS-Index for Japan and Malaysia**



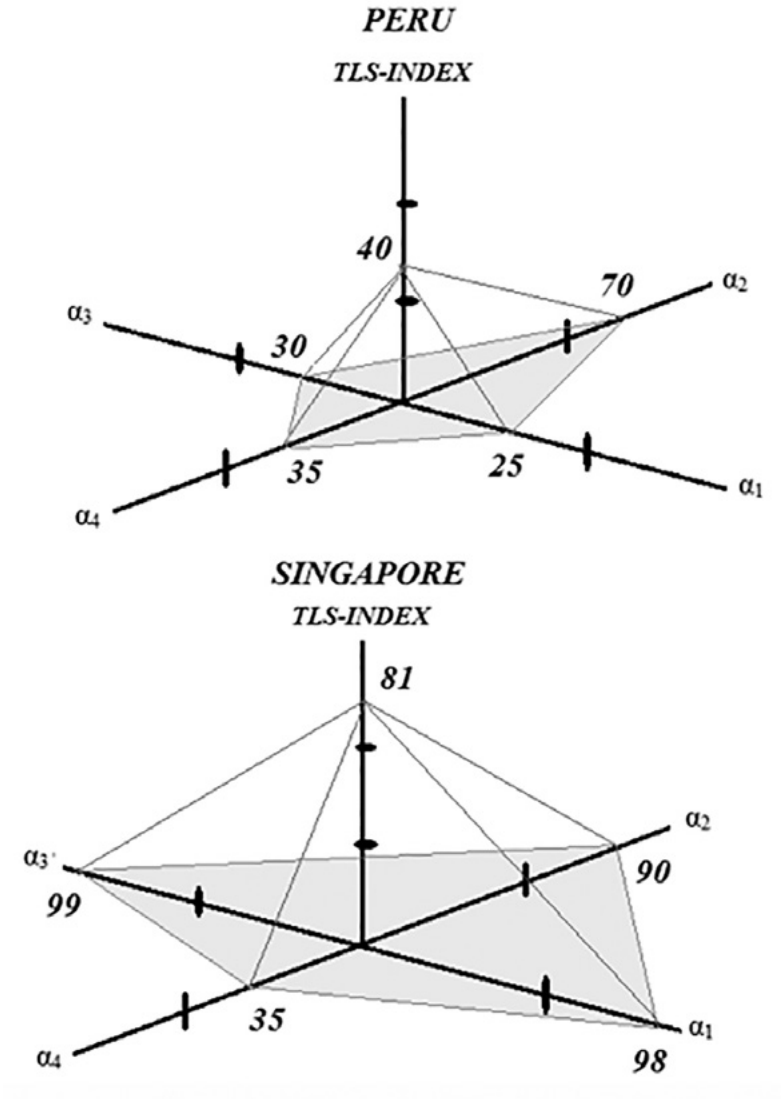

Source: WTO

**Figure 6:**
**TLC-Index and TLS-Index for Mexico and New Zealand**



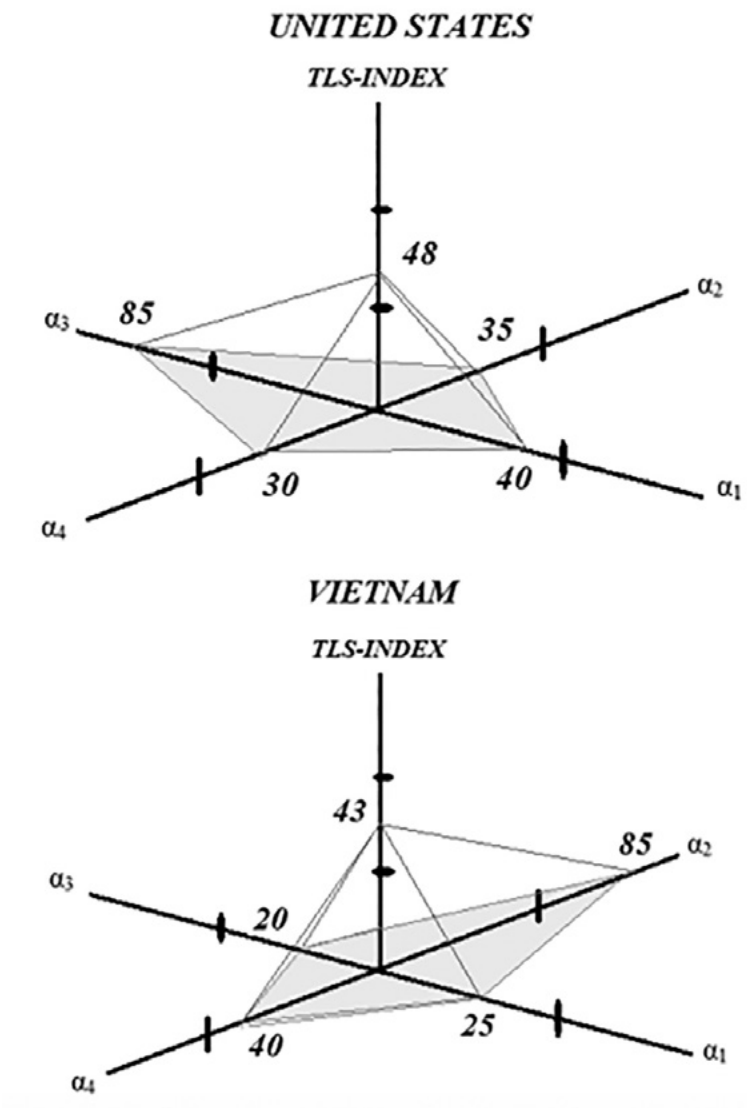

Source: WTO

**Figure 7:**
**TLC-Index and TLS-Index for Peru and Singapore**




Source: WTO

**Figure 8:**
**TLC-Index and TLS-Index for United States and Vietnam**




Source: WTO

## Conclusions

This paper has presented the Trade Liberalization Evaluation (TLE) Methodology. The focus of this methodology is a trade liberalization coverage and stage diagnostic. As such, it enables policy makers and researchers of trade issues to observe and analyze any country's trade liberalization coverage and stage from a new perspective. The new series of indexes such as trade liberalization coverage (TLC-Index) and trade liberalization stage (TLS-Index) and graphs that are introduced in the TLE-Methodology are useful for the study of trade liberalization. This Methodology can certainly be taken as a means to study the stage of trade liberalization that a country or region has applied in its trade evolution.

This research concludes through the trade liberalization does not necessarily generate income growth. As show in the research in this research paper, between 2005 and 2015 only high income countries saw a strong link between trade liberalization and income growth. In the same TLE-Methodology, the application of the TLE-Methodology in this research paper shows that between the closed regionalism scheme and open regionalism scheme is a better regionalism scheme for integrating high and middle income countries. These results can help policy makers and researchers of trade issues to visualize the trends of trade liberalization and trade policy in any country or trade block.

## Annex

1. Heavy industry relies on the use of intensive Capital (K) factor in its production process.

2. Light industry relies on the use of intensive Labor (L) factor in its production process.

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