Impact of Unbalanced Economic Growth to Dynamic Trade Specialization

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Abstract
This paper aims to analyze the influence of Unbalanced Economic Growth on Dynamic Trade Specialization. The first analysis, we must know the value of coefficient Dynamic Specialization from similarities RSCA (Revealed Symmetric Comparative Advantage). Second, we analyze the effects of unbalanced economic growth to the dynamic trade specialization with the econometric model. The Symmetric Revealed comparative advantage (RSCA) is an indicator in measuring the dynamic trade specialization. The coefficient of variation (CV) of sectoral output growth is an indicator of unbalanced economic growth. The countries of Argentina, Brazil, Paraguay, and Uruguay are the units of analysis unit of this research. This research use data on export by SITC Rev 3 from UN- COMTRADE, and data on GDP (value added) from UNSD for period 2000-2015. The results obtained the country Argentina and Brazil possesses positive relations and significantly affect the dynamic trade specialization, but not for the case of the country Paraguay and Uruguay. In addition, the world unbalanced economic growth has a relationship that does not significantly affect the Dynamic trade specialization of all countries selected in this research.
Keywords: Unbalanced Economic Growth, Dynamic Trade Specialization, RSCA, GDP

Introduction
A researcher who consider a country's comparative advantage in the dynamic sense rather than static one where the big attention aimed at the change in the side of the supply or production. World prices and the common changes in technical efficiency which is reflected in the GDP share is the variables that affect the dynamics of comparative advantage (Redding, 2002). In addition, the dynamics comparative advantage influenced by the role of trade, the frictional input in international trade and investment flows substantially to geography, institutions, transports and information cost. Widodo and Shaleh (2010) also examine the impact of unbalanced economic growth upon dynamic trades specialization.

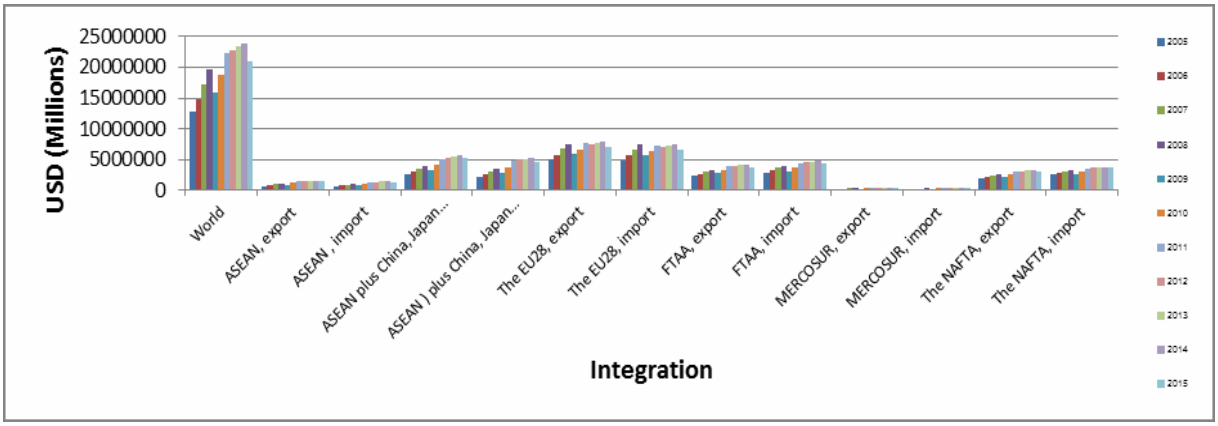

Figure 1 Exports and imports in various areas of economic integration in the world.

Figure 1 Show openness of trade in various integration that occurred in the world, visible exports and imports *Común Mercado del Sur* - Mercosur (Southern Common Market) is smaller than the other integration like ASEAN, ASEAN+3, EU28, and the NAFTA. In average years 2005-2015 the distribution of exports and imports of Mercosur to the world is just 2.04% and 1.932%.

In line with the integration process in the world market, the critical issue is on a country's specialization and dynamic change in comparative advantage, this paper aims to examine the impact of unbalanced economic growth upon dynamic trade specialization. Argentina, Brazil, Paraguay, and Uruguay are chosen for case studies. In session 2, explains about the framework of the theory and empirical studies related to this research. The session 3 discusses methodology and data used, the session 4 shows results and analysis, and last is the conclusion that will be discussed in the session 5.

Methodology and Data

Revealed Symmetric Comparative Advantage

Measurement tools in comparative advantage according to Laursen is Revealed Symmetric Comparative Advantage (RSCA). The RSCA index starting from the Revealed Comparative Advantage (RCA connectors) or Balassa index.

The RCA and RSCA indexes are formulated as follows:

$RCA_{ij} = (x_{ij} / x_{in}) / (x_{rj} / x_m)$ ..... (1)

$RSCA_{ij} = (RCA_{ij} - 1) / (RCA_{ij} + 1)$ ..... (2)

RCA_{ij} represents revealed The comparative advantage of country *i* for the group of products (SITC) *j* ; and x_{ij} denotes total exports of country *i* in group of products (SITC) *j*. Subscript *r* represents all countries except country *i* , and subscript *n* stands for all groups of products (SITC) without group of product *j*. To avoid double counting, the country and group of products under consideration is excluded from the measurement so that the bilateral exchange is more exactly represented (Vollrath, 1991; Widodo & Shaleh, 2010).

The RCA index range has a value ranges from zero to infinity $0 \leq RCAij \leq \infty$. RCA_{ij} greater than one means that country i has a comparative advantage in the group of products *j*. On the other hand, RCAij less than one implies that country *i* has a comparative disadvantage in product *j*. Since the RCA_{ij} turns out to have values that cannot be compared on both sides of one, the index is made to be the asymmetric index and is called the Revealed Symmetric Comparative Advantage (RSCA). The $RSCA_{ij}$ index ranges from negative one to one or $-1 \leq RSCA_{ij} \leq 1$. $RSCA_{ij}$ greater than zero implies that country *i* has a comparative advantage in product *j* . In contrast, $RSCA_{ij}$ less than zero implies that country *i* has a comparative disadvantage in product *j*.

The Dynamics of Specialization

Econometric Model: An econometric model (3) is commonly used to examine the dynamics of comparative advantage (Widodo, 2009):

$ij, = _{i,\,0\text{-}T} + _{i,0\text{-}T}\, ij,0 + ij$ ..... (3)

where

$RSCA_{ij,T}$ and $RSCA_{ij,0}$ = the RSCA indexes of country *i* in product *j* for years *T* and 0, respectively.

ij denotes white noise error term.

The coefficient $\beta_{i,0\text{-}T}$ = the existing comparative advantage or specialization patterns have been reinforced or not during the years of observation.

If $\beta_{i,0\text{-}T}$ is not significantly different from one $\beta = 1$, there is no change in the overall degree of specialization. $\beta > 1$ indicates increased specialization of the respective country. Finally, $0 < \beta < 1$ indicates de-specialization; that is, a country has gained a comparative advantage in

industries where it did not specialize and has lost competitiveness in those industries where it was initially heavily specialized. In the event of $\beta \leq 0$, no reliable conclusion can be drawn on purely statistical grounds; the specialization pattern is either random, or it has been reversed. This equation is conducted for regional or country analysis.

Unbalanced Economic Growth: The output growth of a specific sector for period 0-T in country i can be calculated (Widodo & Shaleh, 2010):

$g_{is,0\text{-}T} = (GDP_{is,T} - GDP_{is,0}) / GDP_{is,0}$ ..... (4)

where $GDP_{is,T}$ and $GDP_{is,0}$ are the country i's growth rate of sector s in years T and 0, respectively. The output growth of a spesific sector might differ from that other sector. So, the dispersion of output growth of sectors shows the unbalanced economic growth in a country (Widodo and Shaleh, 2010).

To indicate the dispersion of output growth sectors (unbalanced economic growth) Widodo and Shaleh (2010) use the coefficient of variation (CV). The Coefficient of variation of sectoral output growth for period 0-T is formulated as follows:

$$CVG_{0-T} = \frac{\sqrt{(\sum_{s=1}^{n}(g_{is,0-T} - \bar{g}_{i,0-T})^2)/n}}{\bar{g}_{i,0-T}} \quad \text{..... (5)}$$

where $\bar{g}_{i,0-T}$ is the country i's average growth rate for the period 0-T. If all sector have the same growth of output (balanced economic growth), the coefficient of variation will equal zero. Based on model Widodo and Shaleh (2010), he makes and estimates regression model to investigate the impact of unbalanced economic growth on the dynamic trade specialization as follows:

$DS_{0\text{-}T} = \mu_0 \ \mu_1 \text{ CVGD}_{0\text{-}T} + \mu_2 \text{ CVGW}_{0\text{-}T} + \varepsilon_T$ ..... (6).

$DS_{0\text{-}T}$ = Degree of dynamic specialitation $\hat{\beta}_{0\text{-}T}$) in period 0-T obtained from the estimation of equation (3)

$\text{CVGD}_{0\text{-}T}$ = Coefficients of variation of domestic economic growth for the period 0-T,

$\text{CVGW}_{0\text{-}T}$ = Coefficients of variation of world economic growth

μ_0 = constant

μ_1, μ_2 = coefficient

ε_T = white noise error term

The interpre1tation of the equation: if a country (i) and world have a balanced economic growth ($\text{CVGD}_{0\text{-}T} = 0$ and $\text{CVGW}_{0\text{-}T} = 0$) , the degree of dynamic trade-specialisation will be constant and equal to μ_0. When a country (i) and world have an unbalanced economic growth ($\text{CVGD}_{0\text{-}T} \neq 0$ and $\text{CVGW}_{0\text{-}T}$ 0), the impact of unbalanced economic growth depends on the estimated coefficients μ_1 and 2.. μ

If μ_1 and μ_2 are negative, the unbalanced economic growth of domestic and the world contribute to decreasing specialisation (de-specialization). $if\ \mu_1$ and μ_2 positive, the unbalanced economic growth of domestic and the world contribute to increasing specialization. The analysis used is the analysis of OLS in form of multiple analysis with the clasiccal assumption must be fulfilled.

Data: We use data on export by the 3-digit Standard International Trade Classification (SITC) Revision 3 that obtained from the United Nations Commodity Trade Statistics Database (UN-COMTRADE) as indicator to calculate RSCA and data on Gross Domestic Products (value added) by economic activities (sector) taken from the United Nations

Statistics Division (UNSD) for period 2000-2015. GDP is divided into seven following sectors: (1) Agriculture, hunting, foresty and fishing, (2) Mining, manufacturing and utilities, (3) Manufacturing, (4) Construction, (5) Wholesale, retail trade, restaurants, and hotels, (6) Transport, storage and communication, (7) other activities.

Result and Analysis

In the figure 2 show the value of coeffisien Dynamic Specialization (DS) for country Argentina, Brazil, Paraguay and Uruguay. This value obtained by similarities (3) in this research. DS is the value of $\hat{\beta}_{0\ T}$) the period 2000-2015. Gained the $\hat{\beta}_{0\text{-}T}$) obtained with simple regression with using SITC Rev 3, 3 digits with 237 commodities. It is apparent that all countries have the value $\hat{\beta}$) smaller than 1 and larger than 0 (0 <β<1) indicates de- specialization; that is, a country has gained a comparative advantage in industries where it did not specialize and has lost competitiveness in an industry where it was initially heavily specialized. This implies that all countries show de-specialization process over time. The countries may have the trade-off between specialization in their existing products (with high comparative advantage but facial level low in technology) and specialization in the other products with many potentiality for comparative advantage in the future as the result of high productivity growth.

The global financial crisis that occurred in 2008-2009 was the worst in 80 years. The supreme mortage crisis in United State eventually manifested into a world-wide financial crisis. No single country is free from the effects, including the countries in Mercosur. This crisis not only affects the financial sector but also real sector. This crisis makes Paraguay more smitten than 3 countries. This shows a more dramatically in the coefficient dynamic specialization on 2008-2014. The decrease means that Paraguay has de-specialized enormously her comparative advantage during that period.

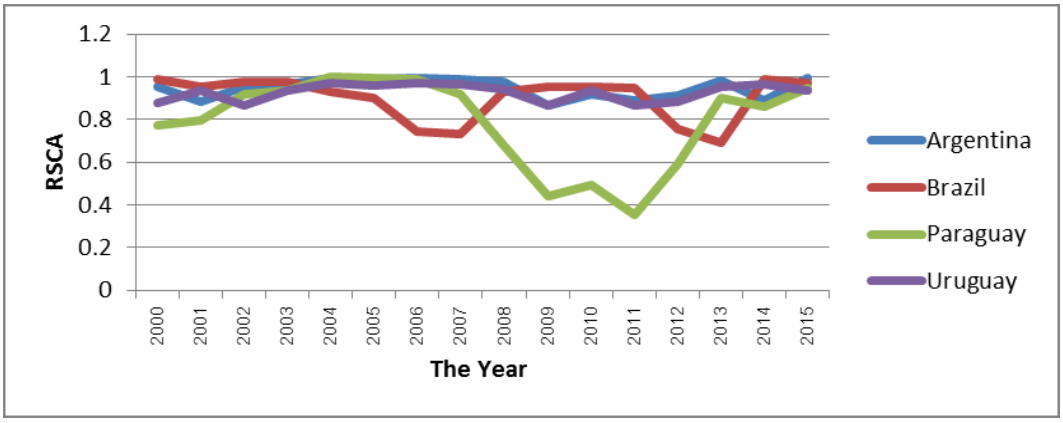

Figure 2 Trends in Dynamic Specialization (DS), 2000-2015

Figure 3 shows the unbalanced value of domestic economic growth (CVGD) obtained from the value of the coefficient of variation of Value-added GDP of each country in 7 sectors. The results show that neither Argentina, Brazil, Paraguay nor Uruguay from 2000-2015 has values that are not equal to 0. This means that based on Widodo and Shaleh (2010) and Todaro and Smith (2011), it shows unbalanced economic growth. In addition to domestic Unbalanced Economic growth, the world's economic growth also, unbalanced. Where the coefficient value of world variation is not equal to zero.

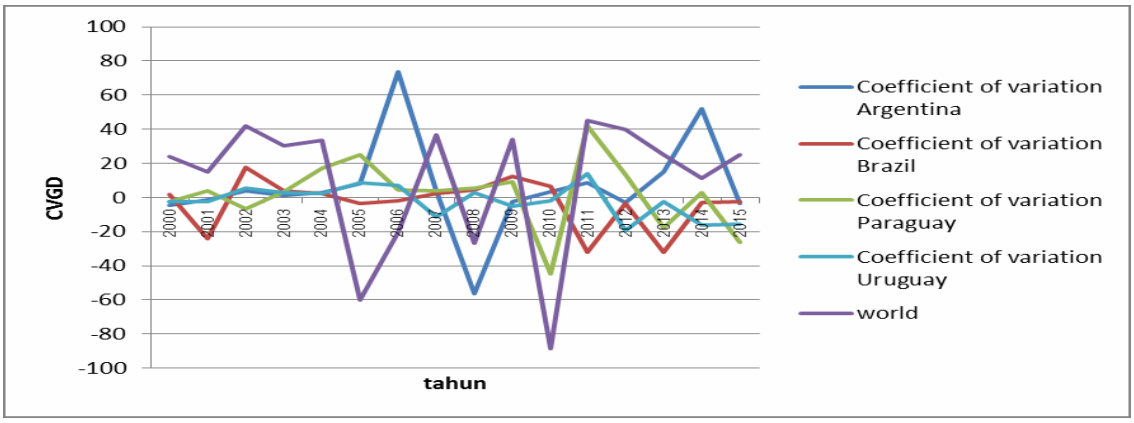

Figure 3 Domestic Unbalanced Economic Growth (CVGD) in Mercosur (Argentina, Brazil, Paraguay, and Uruguay), 2000-2015

Based on Bowen, Hollander and Viaene (1998) economic growth in a country does not balanced can be caused by the change of the k input (capital) or l (labor) or changes in the technology used in each sector. According to (Todaro & Smith 2011) non-homothetic preference causes "structural change" from agricultural sector basis toward manufacturing and services cause unbalanced economic growth. The consequences of the law Engel, where aggregate consumption of agricultural commodities increases less that proportionally with the growth of per capita income because The relative change in the contribution of each sector to total output Extensive industrialization in Mercosur has also been the main reason for unbalanced economic growth. It is influenced by the innovation, the role of technology (Edwards, 1992) and accumulation of human capital.

In table 1 shows the results of the estimation of the econometrica model (6) for country Argentina, Brazil, Paraguay, and Uruguay. The value of Constant μ_0) shows the coefficient dynamic specialization when the domestic economic growth and world economic growth are balanced. Visible all countries have a value smaller than one, this implies that Argentina, Brazil, Paraguay, and Uruguay will have de-specialitazion if the domestic economic growth and the world economic growth are the simultaneously balanced type. When conditions are balanced, Paraguay would have faster de specialization than Brazil, Argentina, and Uruguay. Seen from the value of the constant is much smaller than the 3 other countries (0.7945173 < 0.9145472 < 0.9423431 < 0.9235985).

Table 1 Estimation Results

Coefficient	Argentina	Brazil	Paraguay	Uruguay
Unbalanced domestic economic growth (cvdg)	0.0001936*** (0.0005262)	0.0006814** (0.0003032)	- 0.0012179 (0.0029154)	- 0.0005557 (0.0011969)
Unbalanced world economic growth (cvdw)	- 0.0000187 (0.0000209)	1.6100E-06 (0.0000359)	0.0000262 (0.0000853)	- 0.0000111 (0.0000165)
Constant	0.9423431** (0.0132893)	0.9145472** (0.0256002)	0.7945173** (0.0587888)	0.9235985** (0.0115728)

Notes: *, **, *** mean statistically significant at the level of significance 1%, 5%, and 10% repectively. Figures in parenthis () repersent standar error

The value of the coefficient μ_1 is the value of domestic Unbalanced Economic Growth (CVGD). It is apparent that the coefficient μ_1 countries Argentina and Brazil worth positive and significant impact on the alpha 1 % to Argentina and 5 % for Brazil. This shows that for

the case of countries Argentina and Brazil, their domestic unbalanced sectoral-growth has caused the increase in specialization. The higher unbalanced domestic economic growth, the higher specialized is the exports. This results in line with the research Widodo and Shaleh (2010) who find that Korea, Malaysia, and Indonesia have positive relations between the unbalanced economic growth of trade specialization.

Different countries with Paraguay and Uruguay which is also the one area of economic integration (Mercosur). Domestic unbalanced economic growth in Paraguay and Uruguay have a negative impact and not significant for trade specialization. The higher unbalanced is the domestic economic growth, the less specialized is exports. This results in line with the research Widodo (2010) who find that Singapore has a positive relation between the unbalanced economic growth of trade specialization. According to Edwards (1992) and Rodrik and Frankel et al. in Widodo and Shaleh (2010) note that trade reduces the incentive for research and in turn long-run growth. So that this is possible causes unbalanced economic growth related negative trade specialisation.

The coefficient $\mu_{2,}$ shows the effects of unbalanced economic growth globally. The result shows that the World unbalanced economic growth and all countries, both in the equation Argentina, Brazil, Paraguay and Uruguay did not significantly affect the countries dynamic specialization. This implies that the countries' dynamic specialization is a domestic issue rather than an international competition one.

Widodo and Shaleh (2010) stated that this can happen because the countries are considered as small countries in the world competition and they behave as 'price taker of'. Hence, the world economic growth is as a given thing and the countries only adjust their trade specialization based on domestic supports such as technologies, infrastructures, human resources, capital, labor, etc.

Conclusion

This paper aims to analyze how the impact from unbalanced economic sectoral-growth on dynamic trade specialitazion. Now the results obtained the country Argentina and Brazil possesses positive relations and significantly affect the dynamic trade specialisation, but not for the case of the country Paraguay and Uruguay. In addition, the world unbalanced economic growth has a relationship that did not significantly affect the Dynamic trade specialisation all countries selected in this research.

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