Have workers in the South been competing through trade with workers in the North? Jorge Chami Batista\* – Universidade Federal do Rio de Janeiro Yan Liu\*\* – Dalian Nationalities University

Abstract

This paper introduces and applies a new methodology to deal with competition among exporters of vertically differentiated products and to address the following questions: Considering product markets are segmented, to what extent have developed countries been losing market shares in international trade directly to non-developed countries, the South, or to other developed countries, the North? And to what extent has China been gaining market share directly from the North and the South? Imports of manufactured goods from Japan at the most detailed level of classification are used to answer these questions. To the extent that exports of high-price product varieties from the North do not enter into direct competition with exports of low-price product varieties from the South, employment and relative wages of skilled labour in the North may be sustained.

Keywords: quality; differentiated products; international trade; competition; developed countries; developing countries.

Palavras-chave: qualidade; produtos diferenciados; comércio internacional; competição; países desenvolvidos; países em desenvolvimento.

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Have workers in the South been competing through trade with workers in the North?

In the past two decades (1991-2011), the share of developed economies in world merchandise trade fell approximately 20 percentage points  $(p.p.)^1$ . Export revenue of the North, as developed economies are often referred to in the literature, was down to slightly over half of world export revenues (53%) in 2011. Considering all countries, the North's loss corresponds to the South's gain of market share. The share of developed economies major exporters of manufactured goods fell even more, 22 p.p. in the same period. The G-7 (the US, Germany, Japan, France, the UK, Italy, and Canada) accounted for 91% of the loss of market share of developed countries major exporters of manufactured goods. The main gainers in the South were emerging economies led by China, which accounted for over 42% of the South gains in world exports, Russia, India, Mexico, Vietnam, Brazil, Thailand and Turkey.

As the South expanded its share in world exports, particularly in the 1990s and 2000s, empirical research documented a new pattern of trade specialization. Large economies of the South export roughly the same range of products as the North, but specialize in lower-price varieties of each of these products, while high-income countries specialize in higher-price varieties (Schott, 2004; and Hummels and Klenow, 2005).

This new pattern of trade specialization raises important theoretical and empirical issues. Schott (2004), for example, provides strong evidence that this vertically differentiated pattern of specialization within products can largely be explained by the traditional factor proportion argument that the North exports high-unit-value varieties, which are intensive in the region's abundant capital and skills, while the South exports low-unit-value varieties, which are intensive in the region's abundant unskilled labour<sup>2</sup>.

Bearing in mind the evidence of large differences in prices observed between varieties within products defined at the most detailed level of classification, an interesting empirical issue is to what extent exports from the North enter into direct competition with exports from the South. Fontagné et al. (2008, p.54) suggest that they do not. Therefore, high-income countries would not have to worry so much about the South's rising share in world trade, as long as they kept their share in an expanding upmarket segment. Without direct competition from the South, exports of high-price product varieties would sustain employment and relative wages of skilled labour in the North.

Fontagné et all (2008) also argue that Western Europe has been more resilient to competition from the South than the US economy, just by examining their changes in market shares by segments between 1995 and 2004. The North as a whole can only gains from or lose to the South. However, a country or a particular region in the North, such as Western Europe, may lose market share to the South as well as to other Northern countries. A reduction in the market share of Western Europe does not say whether the region is losing to the South or to other groups of countries in the North.

The main objective of this article is to estimate the changes of market share of major exporting countries or groups of countries of the North and the South in the past two decades, due to direct competition, and uncover to whom each exporter of the North is losing market share on each segmented product market. In addition to finding out whether the North is losing market share in the lower or upper segments of the market, we shall be able to say if North America, for example, is losing market share to developed countries of Western Europe or Asia, or to China and other developing countries, through direct competition.

To achieve this objective, we combine in a pioneer manner two existing methods. First, we segment the import value of each product into three categories: low, medium and high segments, as in Fontagné et al (2008). Then we apply a method of distributing the gains and losses of each exporting country to each of its competitors in each product market, as in Chami Batista (2008). This latter method allows us to estimate, for instance, how much a Northern country or region gained or lost to other Northern or Southern countries or regions in a particular period.

<sup>&</sup>lt;sup>1</sup> Unctad Database. The list of developed countries varies a little according to the source. For Unctad's list see: <u>http://unctadstat.unctad.org/TableViewer/dimView.aspx</u> (accessed 7 July 2012).

 $<sup>^{2}</sup>$  The main contrast with the traditional factor argument is that specialization takes place within products rather than within industries.

The combination of the two methods allows us to measure to what extent exports from the North are in direct competition with exports from the South in different segments of the market and to test the resilience of countries or regions of the North to South competition. It also allows us to test the sensitivity of our results to changes in a particular parameter of the segmentation method that affects the size of each segment, helping us to identify where product varieties of the North and the South enter into direct competition.

Chami Batista (2010) shows that his method of distributing exporters' gains and losses among competitors is consistent with the main theoretical models of competition. However, the method requires that product markets are defined in such a way that the varieties exported by each exporting country directly compete with or are substitutes of the varieties of all the other exporting countries in each product market. These are the relevant product-variety markets. By computing the distribution of gains and losses of each exporter among competitors with different degrees of product market segmentation, the combined methods help to identify the relevant segmented product markets, thus improving both of them.

We also test the two ways of calculating the gains and losses of market share due to direct competition, using Laspeyres and Paasche indices, to provide more robust results.

In addition to this introduction, the article is organized in three parts. Part I provides the theoretical framework, main concepts, and methodology. It is divided in four sections as follows. Section I.1 briefly reviews the literature on North-South models of trade and growth based on vertical differentiation. Section I.2 presents the main concepts used in the article such as relevant product markets and direct and indirect product competition. Section I.3 describes the segmentation method. Section I.4 describes the Constant Market Share Model (CMS) and the method of distributing the gains and losses of market share of countries of the North and the South, due to direct competition, among their competitors. Part II reports the empirical results and is divided in four sections. Section II.1 applies the segmentation method and reports the changes in market shares and the revealed comparative advantages of the North and the South in each segment and without any segmentation. Section II.2 presents the results of the CMS model and the effect of segmentation on the direct competition. Section II.3 shows the gains and losses of the main regions of the North to the South and among themselves. Section II.4 examines the gains and losses of China to the main groups of countries of both the North and the South. Part III concludes.

#### I. Theoretical framework, main concepts and methodology

I.1 North-South models with vertically differentiated products

Theoretically, North-South models based on specialization in vertically differentiated products has a long tradition<sup>3</sup>, and the quality ladder family of endogenous growth models seems to capture the fundamental characteristics of the recent North-South trade competition between varieties within products: The North innovates by improving the quality of its product varieties, while the South imitates and receives investment from Northern firms to produce product varieties first invented in the North<sup>4</sup>. The trade models that emphasize product horizontal differentiation and economies of scale (as for instance, Krugman, 1979) appear to be more relevant to explain trade and growth performances of individual countries with different sizes within either the North or the South.

Quality ladder models traditionally make the simplifying assumption that there is perfect substitution between the vertically differentiated varieties within a product, so that the firm producing the variety with the lowest quality-adjusted price<sup>5</sup> will price out all competitors and become the sole producer and exporter of the product. However, vertically differentiated varieties within a product may be weakly substitutable or not substitutable at all, once we drop the assumptions that quality is unidimensional<sup>6</sup> and consumers are homogeneous. In fact, varieties may have different qualities and features (durability,

developed by Glass and Saggi (2002) also includes foreign direct investment of high-wage countries into low-wage countries. <sup>5</sup> Innovation in quality ladder models can be modeled as a quality improvement as well as a cost reduction. In the first case, quality rises while price remains constant, in the second quality remains constant while price is reduced. In any case, the

<sup>&</sup>lt;sup>3</sup> See the pioneer works of Linder (1961) and Vernon (1966).

<sup>&</sup>lt;sup>4</sup> Grossman and Helpman (1991) set up a North-South model that includes innovation and imitation, while the model

quality-adjusted price falls and the innovator becomes more competitive. <sup>6</sup> Unidimensional means that quality can be measured in just one axis and there is no horizontal differentiation at all within vertically differentiated varieties.

design, mobility, functionality etc.), consumers may have different income levels (Fajgelbaum, Grossman and Helpman, 2009), and heterogeneous firms may have different preferences regarding their purchases of intermediate and capital goods. Heterogeneous consumers may value different qualities differently (Glass, 2001) and thus come up with very different quality-adjusted prices for each variety in the market.

### I.2. Relevant product markets and direct versus indirect competition

It has been well documented that countries export different varieties of the same product at very different prices<sup>7</sup> (Schott, 2004). It has also been well documented that higher per capita income countries tend to export varieties of high unit values, while lower per capita income countries tend to export varieties of low unit values (Schott, 2004; Hummels and Klenow, 2005).

Therefore, countries at different levels of development that sell different varieties of the same product may not be in direct competition, since they may be operating in different market segments. A car that sells for \$20k can hardly be a substitute for one that sells at \$100k. The buyer of the cheaper (more expensive) car is unlikely to buy the more expensive (cheaper) one because of a 10 or 20 per cent discount.

As pointed out by Fontagné et al. (2008), if countries like China and Germany sell the same products, according to available classifications at the most disaggregated level, but are specialized in different segments of each product market, they may not be in direct competition. As a result of little direct competition between countries in the North and the South, they argue that there will be only a weak link between trade and factor prices.

Fontagné et al. (2008) propose a method to segment each product market in three different levels (low, medium, high) based on relative unit values of the exporting countries<sup>8</sup>. They then show that the similarity indices between higher and lower income countries are much smaller when products are segmented than otherwise. Applying their segmentation method and comparing the export market share of each main country/region, they conclude that Western Europe has been more resilient than other developed countries to competition from the South.

Two exporters are in direct competition when they export varieties of a product that are substitutes to each other. The varieties that are substitutes define the relevant product market. If an exporting country gains market (micro) share in a relevant product market, it does through direct competition with other exporting countries.

A country gains market (macro) share through indirect competition when its micro shares do not change (no gains or losses in the relevant product markets), but its total market share rises or falls. This occurs when the size of the product markets in which the country has higher/lower shares increase relatively to the other product markets. Suppose that one country exports to two relevant product markets A and B. Assume that it has 10% of A, 2% of B, and 3% of the two markets together, because market B is larger than market A. Suppose now that, after some time, market A grows to become as large as B and the country maintains the same share in both product markets. As a result, the overall share of the country will rise from 3% to say 6%, although it did not gain market share through direct competition in any of the two markets. It gained through indirect competition.

Constant Market Share Models (CMS) split changes in overall (macro) market share into two components: the competitiveness effect or the direct competition component; and the product composition effect or the indirect competition component.

# I.3. Segmentation method

In order to segment each product market we apply the same method as in Fontagné et al. (2008). Each product market at the 9-digit level of Japan's HS classification is divided into three segments: low, medium and high, according to the relative unit value of the variety exported by each country.

<sup>&</sup>lt;sup>7</sup> In fact, as prices are not directly observable in international trade statistics, empirical work use unit values, defined as the ratio of the export value to quantities, as a substitute for prices.

<sup>&</sup>lt;sup>8</sup> The segmentation method will be presented in Part II of this article.

We denote the relative unit value ratio from country h for product j as  $r_{hj} = UV_{hj} / UV_{wj}$ , where  $UV_{hj}$  is the unit value of product <sup>j</sup> imported by Japan from country <sup>h</sup> and <sup>UV<sub>wj</sub></sup> is the trade weighted (geometric) average of unit value over all flows to Japan for the product j. If  $r_{hj} < 1$  then the import value from country h to Japan for product j is divided into low and medium ranges as follows: the share of low range is  $(1 - r_{h_j}^{\alpha})$  and the share in medium range is the complement  $r_{h_j}^{\alpha}$ ; if  $r_{h_j} > 1$  then the import value from country h to Japan for product j is divided into high and medium ranges as follows: share in top range is  $(1-1/r_{hj}^{\alpha})$  and share in medium range is  $1/r_{hj}^{\alpha}$ . If  $r_{hj} = 1$ , the whole flow is ascribed to the medium range.

Since the method allocates each country's export revenue of each product into two different segments, it recognizes that each unit value represents the weighted average of some firms' export prices, during the course of one year, that are likely to be dispersed around that average. The parameter  $\alpha$ regulates the smoothness of the market segment allocation function. Fontagné et al. (2008) sets it equal to four so as to make each segment equal to one third of world trade. We see no reason why to do the same with Japan's imports. Furthermore, it should be recalled that Fontagné et al. (2008) uses data at the 6-digit level of classification. Since segmentation is very sensitive to the data level of aggregation and our study uses a more detailed level of classification, a specific criterion should be found to justify the value of the alpha parameter.

I.4. The CMS model and the distribution of market share changes

The basic Constant Market Share (CMS) model breaks down the change in the aggregated market share (or macro share) of a particular exporter into two main components: the direct competition, or competitiveness effect, and the indirect competition, or the product composition effect.

The micro share of country H in country L's imports of product i in year t is defined as:  $a^{HLi}(t) \equiv$  $X^{HLi}(t)/M^{Li}(t)$ , where  $X^{HLi}$  is country H's exports of product i to country L and M is country L's imports of product i. Assuming there are n products, we may define the row vector of dimension n as:  $\mathbf{a}^{\text{HL}} \equiv (a^{\text{HL1}}, \dots a^{\text{HLi}}, \dots, a^{\text{HLn}}).$ 

The macro share of country H in country L's imports in year t is:

$$A^{HL}(t) \equiv \sum_{i} X^{HLi}(t) / \sum_{i} M^{Li}(t).$$

The macro share change of exporting country H to importing country L in the period between year 0 to year t ( $\Delta A^{HL}$ ) may be written as:

$$\Delta A^{\rm HL} \equiv A^{\rm HL}(t) - A^{\rm HL}(0)$$

where  $A^{HL}(t)$  is the inner product of the vector of H's micro shares ( $\mathbf{a}^{HL}$ ) and the vector of product shares of country  $L(\mathbf{b}^{L})$  in year t.

 $A^{HL}(t) \equiv \mathbf{a}^{HL}(t)\mathbf{b}^{L}(t)$ 

where  $\mathbf{b}^{L}$  is the column vector of dimension m:  $\mathbf{b}^{L} \equiv (\mathbf{b}^{L1}, \dots, \mathbf{b}^{Li}, \dots, \mathbf{b}^{Lm})$  and  $\mathbf{b}^{Li} \equiv \mathbf{M}^{Li}(t) / \sum_{i} \mathbf{M}^{Li}(t)$ . Combining identities (1) and (2), we have:

 $\Delta \mathbf{A}^{\mathrm{HL}} \equiv \mathbf{a}^{\mathrm{HL}}(t)\mathbf{b}^{\mathrm{L}}(t) \cdot \mathbf{a}^{\mathrm{HL}}(0)\mathbf{b}^{\mathrm{L}}(0)$ and.  $\Delta \mathbf{A}^{\text{HL}} \equiv [\mathbf{a}^{\text{HL}}(t) \cdot \mathbf{a}^{\text{HL}}(0)] \mathbf{b}^{\text{L}}(0) + \mathbf{a}^{\text{HL}}(t)[\mathbf{b}^{\text{L}}(t) \cdot \mathbf{b}^{\text{L}}(0)]$ 

(4) where the two terms on the right hand side of the identity are the direct and the indirect competition components of the macro share change of exporting country H to importing country L in the period between year 0 to year t.

Identity (4) may also be written as:

 $\Delta \mathbf{A}^{\mathrm{HL}} \equiv [\mathbf{a}^{\mathrm{HL}}(t) \cdot \mathbf{a}^{\mathrm{HL}}(0)] \mathbf{b}^{\mathrm{L}}(t) + \mathbf{a}^{\mathrm{HL}}(0)[\mathbf{b}^{\mathrm{L}}(t) \cdot \mathbf{b}^{\mathrm{L}}(0)]$ 

(5)

(1)

(3)

Therefore, the direct competition component of the macro share change may be calculated in two different ways, one using initial-year weights (a Laspeyres index) as in identity (4), and the other using end-year weights (Paasche index) as in identity (5).

The method of distribution of market share changes due to direct competition in international trade was developed in Chami Batista (2008) and its theoretical foundations were discussed in Chami Batista (2010). The method starts with the micro share change of exporting country H in importing country L of commodity i in the period from year 0 to year t. We drop the superscripts L and i to ease the notation:  $\Delta a^{H}(t) \equiv \sum_{J \neq H} \Delta a^{HJ}(t) \equiv \sum_{J \neq H} [\Delta a^{H} a^{J}(t) - \Delta a^{J} a^{H}(t)]$ (6)

where J represents all countries competing with H in the i market and  $\Delta a^{HJ}$  is defined as the part of the micro share change of H that is ascribed to the micro share change of J. It is assumed that the varieties supplied by country H and countries J in the product market i are substitutable to each other. As a result of identity (6), the sum of country H's gains and losses to all competing countries J is identical to country H's net gain or loss. In addition to that, Chami Batista (2008) assumes that:

 $\Delta a^{HJ} = \Delta a^{H} a^{J} - \Delta a^{J} a^{H} = a^{H} a^{J} (\Delta a^{H}/a^{H} - \Delta a^{J}/a^{J})$ (7) so that  $\Delta a^{HH} = 0$  (country H does not gain or lose market share to itself) and  $\Delta a^{HJ} = -\Delta a^{JH}$  (country H's gain from country J is equal to the loss of country J to country H). Summing up equation (7) across all relevant markets i, we find the net gain or loss of exporting country H to exporting country J in the importing country L in the period from 0 to t.

## **II.** Empirics

This study uses annual data on Japanese imports of manufactured products<sup>9</sup>. There were 6108 manufactured products at the 9-digit level of the harmonized System (HS) in 2010<sup>10</sup>. The nine-digit HS was introduced in 1988 and revised in 1992, 1996, 2002 and 2007. To trace each product category consistently through time, we use the initial and end-year data of five sub-periods: 1988-1991, 1992-1995, 1996-2001, 2002–2006 and 2007-2010.

As a result, we have a much longer time period of analysis (1988-2010) and a much more detailed product classification (the 9-digit level of the Harmonized System) than the period (1994-2005) and product disaggregation (6-digit level) used by Fontagné et al (2008).

Our data also differs from Fontagné's, because it focuses only on Japan imports rather than on world imports. Although we obviously lose in coverage, there are some advantages in focusing on Japan only<sup>11</sup>: (i) since richer countries import more from countries that produce higher quality products<sup>12</sup>, differences in demand for quality across countries are removed when only one importing country is considered; (ii) Japan is one of the largest trading partner of China, North America and Western Europe; and (iii) Japan does not have trade agreements with none of these trading partners<sup>13</sup>.

Countries are classified by region and income levels, according to the World Bank classification, and are reported in the Appendix. According to their income levels, countries are classified in ascending order as Low, Lower Middle, Upper Middle, and High. Countries are part of the North if they are classified as High and are otherwise part of the South. Because relative unit values are related to the level of development and we are interested in the dynamics of such a relation, we allow countries to change their classification according to their per capita income between different sub-periods. Within each sub-period, countries are classified at the initial year.

II.1 Market shares and trade specialization of the North and the South

The top part of Table (1) shows that, without any segmentation, the share of the North in Japan's imports of manufactured goods declined drastically from 1988 to 2010, losing 25 percentage points (p.p.), despite the fact that some countries moved up from the South to the North in the period<sup>14</sup>. The share of the North falls in every sub-period analysed in this work and is smaller than the share of the South in 2010.

The shares of developed North America (NA) and Western Europe (WE) increase from 1988 to 1991, but fall significantly from 1991 to 2010. NA loses 17 p.p. from 1988 to 2010 and WE loses 8 p.p.

<sup>&</sup>lt;sup>9</sup> Data is from the Trade Statistics of Japan -Ministry of Finance (MOF)

<sup>&</sup>lt;sup>10</sup> We only considered products HS 9-digit from chapter 28 to 96 (manufactured products), for which information on quantities are available.

<sup>&</sup>lt;sup>11</sup> Kiyota (2010).

<sup>&</sup>lt;sup>12</sup> Hallak (2006).

<sup>&</sup>lt;sup>13</sup> <u>http://www.mofa.go.jp/policy/economy/fta/index.html</u> (accessed 13 January 2013).

<sup>&</sup>lt;sup>14</sup> South Korea, Macao, Portugal, Malta, Greece, Estonia, Croatia, Check Republic, Slovak Republic, and Slovenia are the main countries that have made their way from the South to the North.

in the same period. The share of WE has become larger than the share of NA since at least 2006. Therefore, the share of WE has generally been more resilient to competition in Japan than the share of NA.

The share of developed Asia goes up 4 p.p. from 1988 to 2010, but this is due exclusively to South Korea entering the developed group in 1995/96. Without South Korea, the share of developed Asia would have declined 1.6 p.p. in the period. The share of South Korea also falls 1.3 p.p. from 1988 to 2010.

As the North's share falls, the share of the South rises from 28% in 1988 to 55% in 2010. The main driver of the rising share of the South has been the consistent and robust increase in China's market share during the whole period of 1988-2010. Excluding South Korea from the South, the Rest of developing Asia (RoA) also gains market share in the period. It is worth noting that the share of all other non-developed countries taken together falls in the period.

Before segmenting the product markets, we tested the segmentation of both Japan's total imports of manufactured goods and of a quite homogeneous product for setting a reasonable range of possible values for alpha. Chami Batista and Silveira (2010) show that the unit values of internationally traded tin behave in a manner very close to what is theoretically expected from a homogeneous product. They use monthly data on unit values from imports of the US and Japan at the most detailed level of classification available in each country<sup>15</sup>.

Table (2) reports the size of the medium segment for Japan's imports of manufactured goods for Japan's imports of tin for different years in the period 1988-2010 and for different values of alpha. The smaller is the alpha value, the larger is the size of the medium segment. We would like to choose a range of values for alpha such that the size of the medium segment is significantly smaller than half of Japan's imports of manufactured goods, in order to capture a scenario in which Japan's import market is quite segmented. After all, we want to estimate the effects of direct competition among exporters under the hypothesis that product markets are segmented. But we would also like to choose a value for alpha such that a high percentage of the import value of tin is allocated to the medium segment, in order to reflect the high degree of homogeneity of the product.

As Tables (2) reveals, for alpha smaller than 3 the medium segment of Japan's imports of manufactured goods would not allow much segmentation, and for alpha greater than 5 the medium segment of tin would be too small for a quasi-homogeneous good. We conclude that a range between 3 and 5 for alpha is quite appropriate for our sensitivity tests.

When Japan's import market of manufactured goods is segmented<sup>16</sup>, it is possible to observe on the bottom part of Table (1) that the North suffers dramatic losses in the low and medium segments in the 1988-2010 period and in each and every sub-period. This is a clear evidence of the fierce price competition from the South with which the North was confronted in these segments during this period. In the early period of 1988-91, the North makes some gains in the high segment, but that is not enough to offset the losses in the low and medium segments. In all the other sub-periods from 1992 to 2010, the share of the North falls in the high segment<sup>17</sup>.

Based on this surprising evidence and on North-South growth models, one could say that, during this period, the rate of quality improvement applied to products produced in the North was lower than the rate applied to products produced in the South through imitation and knowledge transferred from Northern firms.

China's market share gains take place largely in the low and medium segments. In the low segment, China's share jumps from 9.8% in 1988 to reach a staggering 52% in 2006, remaining stable after that. In the medium segment, the rise is continuous from 4.5% in 1988 to 42% in 2010. China's share in the high segment was about 1% from 1988 to 1996. After that, it rose continuously, and at a faster rate than China's shares in the other two segments, to reach 6.2% in 2010. The Rest of Asia, formed

<sup>&</sup>lt;sup>15</sup> In the US tin is classified as HS 800110.0000 and in Japan is HS 800110.000.

<sup>&</sup>lt;sup>16</sup> The figures presented in the analysis by segment are calculated with alpha equal to 4. Changing the parameter alpha of the segmentation method to 3 raises the relative size of the medium segment, while changing it to 5 does the opposite. However, the impact is quite small and has little effect on the dynamics described in this section.

<sup>&</sup>lt;sup>17</sup> In fact, the share of the North rises between 1995 and 1996 (not shown), but this is exclusively due to South Korea leaving the South and joining the developed North.

by developing Asia countries other than China (RoA), also shows significant gains in market share in all segments in the period 1988-2010, once South Korea is excluded.

Given that South Korea is one of the few examples of a developing country that has moved up to become a high-income economy, it is interesting to look into her changing shares by segment. Her share in the low segment suffers a drastic fall, much like other developed countries of Asia, and in sharp contrast with China and the RoA. However, in the high segment, South Korea does not show a definite trend in her market share, showing some ups and downs. This is again in contrast with China and the RoA in the South and also with developed Asia, as the shares of all these parts of Asia reveal a clear upward trend in the high segment. South Korea seems to be positioned somewhere in between the performance of the developed countries of the western world and the performance of other countries of Asia.

The group of countries of the South classified as others show a fall in their market share in all segments and periods, except in the high segment between 1995 and 2010, when it shows a rising trend. It appears that these countries have been forced to improve the quality of their manufactured products and compete in the upper market segment, given their difficulties in facing the price competition of China and other non-developed Asian countries in the low and medium segments.

Considering that the North still maintains 30% of the low segment in 2010, the South can still make further gains. Low-income countries like Cambodia (L) and Bangladesh (L) and low-middle-income countries like Vietnam (LM), Indonesia (LM) and the Philippines (LM), among others, have some potential to increase their market share. On the other hand, China appears to face difficulties in further raising her share in the low segment, having moved up from a low-income (L) in 1988 to a lower-middle-income in 1997 and to an upper-middle-income (UM) economy in 2010.

Table (3) reports the changes in the specialization index (Balassa's revealed comparative advantage) of the main groups of developed and developing countries during the period between 1988 and 2010.

As expected, the North reveals comparative advantage in the high segment, while the South reveals comparative advantage in the low and medium segments. More interestingly, while the North has become more specialized in the upper market segment, the South has reduced its revealed comparative advantage (RCA) in the lower market segment. In other words, the losses of the North in the high segment were relatively smaller than in the low and medium segments. On the other end, the gains of the South in the low segment were relatively smaller than in the medium and high segments.

Western Europe has shown RCA in the high segment since the start of our period of analysis, while North America, developed Asia and other developed countries have become specialized in the high segment during our period of analysis. Western Europe has the highest RCA in the high segment and the lowest in the medium segment. The RCA of North America has been similar to Western Europe's in the low segment, but it has been much higher in the medium segment and much lower in the high segment<sup>18</sup>. Developed Asia has the highest RCA in the low segment and the lowest in the high segment among these three main groups of the North.

Within the South, China is more specialized in the low segment than the Rest of Asia (RoA) and has become more specialized in the medium segment than the RoA within this period. On the other hand

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