DYNAMIC COMPARATIVE ADVANTAGE AND INDUSTRY CHARACTERISTICS AS BASIS FOR TRADE IN TEXTILES AND CLOTHING

I.K.M. Mokhtarul Wadud, Wahida Yasmeen***

Abstract

This paper examines dynamic comparative advantage in textiles and clothing trade and the country specific factors that explain variations of comparative advantage among the trading nations. Comparative advantages are estimated constructing indices of revealed comparative advantage (RCA) using export shares of textiles and clothing industries over 1981-2005. The estimated RCA indices of absolute and relative change show that while comparative advantage in both textiles and clothing is tilted towards the developing economies, a number of developed high income economies possess comparative advantage over extended periods. In the second stage, RCA indices are regressed against some country specific industry characteristics such as capital/labour ratio, wage rate and industry sizes. The estimated models show significant relationship between comparative advantage and the country characteristics. Results of this study provide evidence of changes in the pattern of comparative advantage in textiles and clothing over the decades when multi fibre arrangement (MFA) type trade restrictions were in place. These evidences have implications for the trading nations in the ongoing liberalised trade regimes.

Keywords: Revealed comparative advantage, Textiles & clothing, Export Shares, Factors Affecting Comparative Advantage

**School of Accounting, Economics and Finance, Deakin University, Pigdons Rd., Waurn Ponds, Geelong, Vic 3216, Australia*
Tel: (+613) 52272051
Fax: (+613) 52272151
E mail: mokhtarul.wadud@deakin.edu.au
***Department of Economics, St. Francis Xavier University, P.O. Box 5000, Antigonish, NS B2G 2W5, Canada*
Tel: (902) 867 2178
Email: wyasmeen@stfx.ca

I. Introduction

Textiles industries have traditionally led the process of industrialisation in many developed industrialised economies.[25] Over the past fifty years or so, a significant number of low wage developing economies attained phenomenal export oriented growth of these industries, much in reflection of their comparative advantages in these unskilled labour intensive sectors. While the specialisation and export growth of textiles and clothing (TC) industries in the developing economies has been inevitable, the net importing nations mainly represented by the developed economies took recourse to tariff and non tariff restrictive measures such as the Multi Fibre Arrangement (MFA), which was eliminated only recently upon lasting for more than three decades. With the MFA quotas abolished by the end of 2004 and the emergence of ongoing liberalised regimes, the developing economies face further prospects in their export led growth of TC industries. However, there has been a surge in competition among these economies resulting in uncertainties of sustainable market shares. Also, as income and labour costs grow with changing factor and resource endowments of the developing economies and as the developed economies retain a lead in the knowledge-base and technologies, the dynamics of specialisation and exports in TC products becomes more apparent. This implies that while a general shift of comparative advantage in TC industries from developed to developing world could

[25] The role of textiles industries is manifested in the models of product life cycle (Vernon, 1966, 1979; Hirsch, 1975) and dynamic comparative advantage (Klein, 1973; Claudon, 1977). These models explain growth path of economies – from resource-intensive exports to unskilled labour-intensive such as textiles and clothing exports; and then to skilled labour-intensive exports followed by rungs of capital-intensive and knowledge intensive specialisations. One could also visualise the resemblance of these models with Rostow's (1960) five stages of growth, with contribution of textiles at a stage such as 'pre conditions for take- off'.

be predicted, the specific nature of such dynamics would depend on the industry differences, growth path of economies and a number of industry characteristics.

There have been some concerns among researchers with regard to measurement of comparative advantage. Comparative advantages could be measured through commodity's trade balance, comparing the production costs and estimating the export shares of the commodities (Ariovich, 1979). However, measuring trade balance and comparing production costs have been cumbersome tasks due to unavailable or asymmetric costs and price information, dynamics in trade policies and cross country differences in protections. Alternatively, computing commodity export shares has been empirically feasible as indicative of relative competitiveness. In his seminal study, Balassa (1965) showed that differences in relative costs and non-price factors are reflected in the pattern of trade in manufacturing and these are assumed to 'reveal' the comparative advantage of trading nations. Balassa (1965) maintained that with opportunity cost differences across economies and product specialisation, exports of each country would be dominated by the product in which the country possesses stronger comparative advantage.

Balassa's (1965) RCA approach for measuring comparative advantage gas generated a wide set of empirical studies. These studies examined both intra-economy industries through comparison of sub-sectors (e.g., Ariovich, 1979; Crafts and Thomas, 1986; Olga, 1994; Lee, 1995; Ferto and Hubbard, 2003; Cinquetti, 2008) and cross country trade performances (Reza, 1983; Peterson, 1988; Yeats, 1991; Rodas-Martini, 1998; Bender and Li, 2002).[26] A number of studies specifically examined the comparative advantage in textiles and clothing trade. Pigato et. al. (1997) compared the performances in textiles trade of twelve South and South East Asian economies. They computed relative changes in the RCA in four-year intervals from the early 1960's to the mid 1990's and found relative competitiveness for economies with homogeneous development and income status. However, the study did not compare the dynamic nature of comparative advantage in textiles trade among a broader range of economies, both developed and developing (Wadud, 2007). Havrila and Gunawardana (2003) examined comparative advantage in Australian textiles and clothing industries using RCA indices and Vollrath's (1991) measures of competitiveness.[27] Balasubramanyam and Wei (2005) compared the export performance of the textiles and clothing industries in India and China using RCA indices and found that China possesses higher comparative advantage in both textiles and clothing, while India enjoys comparative advantages in clothing products such as various categories of women's wear and in men's shirts. The aforementioned studies incorporated analyses of comparative advantage in textiles and clothing for specific countries or for smaller country groups. Kilduff and Ting (2006) attempted to extend the analysis of comparative advantage in textiles using a panel framework. They estimated RCA indices for 30 countries over 42-year period and examined dynamics of comparative advantage across years as well as between income and product groups. Kilduff and Ting (2006) found that product and income group characteristics combine to affect comparative advantage with higher and lower income nations generally remaining stronger in capital and labour intensive sectors, respectively. Wadud (2007) conducted a very similar study, by analysing RCA and Intra-Industry Trade (IIT) indices in textiles and clothing industries in 26 selected countries over 1981-1997. Wadud (2007) showed that while comparative advantage in textiles and clothing is generally tilted towards the developing economies, a few developed high income economies enjoyed sustainable comparative advantages in textiles trade. Wadud (2007) also suggested exploitation of forms of competition such as product differentiation and cost minimising as some of the strategic options for textiles and clothing, respectively.

This study is an extension of Wadud's (2007) work and is similar to Kilduff and Ting (2006). One limitation of Kilduff and Ting (2006) study was that the study incorporated descriptive approach to identify patterns of development of RCA across countries and hence, precise relationship such as the factors that affected such growth was not known. Wadud (2007) added further insights by examining rank correlation between income and RCA indices and patterns of IIT in the industries. However, Wadud's (2007) study is associated with a couple of pitfalls. Firstly, in calculating the RCA indices Wadud (2007) used total merchandise exports of countries and not total manufacturing exports as required by Balassa's proposition. Secondly, Wadud (2007) examined RCA for the period 1980-1996 leaving the dynamics of the RCA patterns of the more recent years unexplored. In this paper, we have attempted to overcome these limitations by using the total manufacturing exports in our estimations of RCA and by extending the period of coverage till 2005. Further, we also examined how country specific factors affect comparative advantages in textiles and clothing using a panel econometric framework.

The paper is structured as follows. Section Two provides a brief methodological overview of RCA indices and the econometric modelling used. Section Three discusses the empirical results on the dynamics of RCA indices, the IIT patterns and country specific industry characteristics that explain comparative advantages in a longitudinal perspective. Section Four concludes.

[26] Also see Wadud (2007)

[27] They showed that while Australia has strong comparative disadvantage in textiles and clothing as aggregate commodity groups, it has comparative advantage in some 'special textiles products' such as floor covering, tapestry and fur clothing.

II. Measurement of Comparative advantage

Trade Theories and the Revealed Comparative Advantage (RCA) Approach

Following Ricardian proposition on comparative advantage, a number of economists examined the basis of comparative advantages and consequences of product specialisation in factor markets. The Heckscher-Ohlin theory asserts that a country, which is relatively abundant in a factor, will produce and export the good that uses the abundant factor intensively. The Stolper-Samuelson model maintains that a rise in the relative price of a good will lead to a rise in the return to that factor which is used most intensively in the production of the good, and conversely, to a fall in the return to the other factor.[28] These models suggest that factor endowments are important determinants for trade driven by comparative advantage with dynamic implications for product specialisation and factor payments in the trading economies.[29]

While trade theories have much been examined and tested with empirical data, the problem with measuring comparative advantage persisted until Balassa's (1965) seminal work on RCA. The key to Balassa's (1965) argument was that comparative advantage in a product would be revealed by an economy's trade pattern of that product. Balassa maintained that a country's relative export share of a commodity could reveal the comparative advantage in that commodity. The relative shares are can be expressed as follows,

$$\frac{X_{ij}}{X_{rj}} \Big/ \frac{X_{iT}}{X_{rT}} = \frac{x_{ij}}{x_i} \qquad (1)$$

Where X stands for exports, x's are the relative shares, subscripts i, j, r and T represent ith country, jth commodity, aggregate of any region or group of economies and manufacturing total, respectively. The relative export share of a product of a country expressed in (1) above numerically reveals the proportion by which a country's export share in a particular product exceeds total export share of all the manufactured products in a region or group of economies. While equation (1) represents the RCA indices in absolute terms, changes in relative shares from period t and $t+1$ are obtained as follows,

$$\frac{x_{ij}^{t+1}}{x_i^{t+1}} \Big/ \frac{x_{ij}^{t}}{x_i^{t}} \qquad (2)$$

Further, to correct for the bias due to large (small) change of exports with small (large) volume of exports,[30] Balassa reformulated (2) as follows,

$$\frac{1}{2}\left[\frac{x_{ij}^{t+1}}{x_i^{t+1}} + \frac{x_{ij}^{t+1}}{x_i^{t+1}} \frac{x_{ij}^{t+1}}{x_i^{t+1}} \Big/ \frac{x_{ij}^{t}}{x_i^{t}} \right] \qquad (3)$$

Equation (3) is based on the presumption that while past trends in relative shares can be expected to continue, this will take place at a declining pace as compared to the past.

Balassa also argued that assuming uniformity of tastes and rates of protection across countries, comparative advantage could be revealed by export-import ratios. However, for intermediate products, export import ratios are influenced by demand for purposes of further transformation in producing for exports. Cross country difference in tastes and rates of protection also imply advantages of using relative export shares as a measure of comparative advantage over the export import ratios.

Despite its merits, Balassa's RCA approach suffers from asymmetry (Vollrath, 1991; Kiduff and Ting, 2006). The asymmetry arises because the index ranges from zero to one and from one to infinity if a country is not specialised and specialised in a given sector, respectively. Vollrath (1991) suggested taking logarithmic values of the RCA indices to solve the asymmetry problem, in which case existence of comparative advantage (disadvantage) is indicated by the positive (negative) values of the indices.

The Intra Industry trade (IIT) and comparative advantage

This study also examines the trade pattern in view of the new growth theory that identifies IIT in textiles and clothing products. An advantage of incorporating analysis of IIT is that rising and falling IIT refer to trade based on product differentiation and comparative advantage, respectively. IIT arises due to product differentiation under imperfectly competitive markets, changes in consumers' preferences and ability of trading nations to exploit benefits of economies of scale. To measure IIT, the Grubel-Lloyd (GL) index is used in this study.[31] In particular, in this study, we

[28] The Stolper-Samuelson proposition closely relates to the factor price equalization theory, which states that the relative prices for two identical factors of production in the same market will eventually equal each other because of competition.

[29] See Deardorff (1980); Wood (1994); Kilduff and Ting (2006) and Chipman (2008).

[30] Balassa (1965) pointed out that high growth rates are achievable even when exports are small in absolute terms and that growth would be low for a country with an export share too large to extend any further.

[31] Grubel and Lloyd (1975) index, one of the most widely used measures of IIT, is given by,

extended the GL indices estimated by Wadud (2007) for the 1997-2005 period.

Determinants of comparative advantage

Both theory and empirics suggest that a number of factors may determine or affect the comparative advantage in any product. In view of the Heckscher-Ohlin model, economies with abundant capital and labour force would possess comparative advantage in industries that use capital and labour deepening methods, respectively. Hence, countries with abundant labour force would have comparative advantage in textiles and clothing industries, which are primarily labour intensive sectors. Based on prediction of the Stolper-Samuelson theory, country specific specialisation driven by rise in prices of textiles and clothing products would raise the wage rate in these industries. In addition, there are a host of other factors that also affect country specific specialisation and trade including income, government policies and economies of scale.[32]

The scope of this study has been extended by incorporating a number of major country specific factors that could affect comparative advantage in textiles and clothing trade. To achieve this, the effects of the country characteristics on the comparative advantage indices have been examined in a panel econometric framework. In view of the standard trade theories and empirical evidence, we used county specific wage rates, capital base, factor proportions and industry sizes as the main variables in the model.[33] The model is given as follows,

$$RCA_{it} = \alpha + \beta w_{it} + \gamma F_{it} + \delta S_{it} + \theta K_{it} + \varepsilon \quad (4)$$

$$GL = \frac{\left[\left(X_i + M_i\right) - \left|X_i - M_i\right|\right]}{\left(X_i + M_i\right)}$$

Or equivalently,

$$GL = 1 - \frac{\left|X_i - M_i\right|}{\left(X_i + M_i\right)}$$

Where, GL stands for Grubel-Lloyd index of IIT, X and M represent values of total exports and imports of the *i*th product, respectively. The GL index can range from zero to one. A value of zero of the G-L index indicates that trade is purely inter industry and that there is no IIT in the corresponding sector. Converesly, a value of unity of the index shows that trade is intra industry type. In general, the higher is the value of the index, the higher is the magnitude of IIT in a given industry.

[32] See Fitgerald and Hallak (2004) and Kilduff and Ting (2006)

[33] A number of other variables could also be chosen to examine the effects of domestic and international policies including indices such as effective rates of assistance. However, data limitation severely restricted this option.

Where *w*, *F*, *S* and *K* represent industry specific wage rates, factor proportion, size and capital, respectively for the *i*th country in the *t*th year. The variables *F* and *S* are measured by taking capital-labour ratios and industry gross outputs, respectively. The RCA regression for panel data given by (4) above has been estimated separately for textiles and clothing industries.

Data

This study covers a period from 1981 to 2005. Textile and clothing industries have been categorised according to revision three of Standard Industrial Trade Classification (SITC) scheme. Under this scheme, textile and clothing industries are coded as SITC division 65 and 84, respectively. Export-import data of textiles, clothing and manufacturing industries are obtained from online statistics database provided by the World Trade Organization (WTO). This online database reports time series trade data of selected manufacturing products including textiles and clothing, under the merchandise trade by commodity category.

Data on the country specific variables for each industry such as industry gross output, wages and capital-labour ratios have been obtained from the United Nations Industrial Development Organisation (UNIDO) 3 digit ISIC database. While the other variables are directly reported in the database, information on industry specific capital stock or value of fixed assets is not available from the database. Instead, data on gross fixed capital formation was reported, which are used to calculate the capital stock per industry using perpetual inventory method.[34]

III. Evidence on dynamic Comparative Advantage and determinants

Estimates of the absolute RCA indices

The RCA indices of export shares as per equation (1) have been reported for the 26 selected economies in Table 1 and Table 2 for the textiles and clothing industries, respectively. The indices of absolute change have been computed for all years over the period 1981-2005 and have been reported mostly in three-year benchmark. The RCA indices have been expressed in terms of logarithmic values[35] of the RCA indices, which indicate high and low comparative advantage in terms of positive and negative values of the indices, respectively (Lee, 1995; and Petri, 1988).[36]

[34] Note that information on average asset life in the textiles and clothing industries in different countries was difficult to obtain and hence the investment series data was used from the UNIDO database for available number of years not exceeding a lag of 16 years.

[35] These values are taken of base 10.

[36] In terms of the logarithms of the RCA indices, a country's global share of export of a given commodity,

As reported in Table 1, RCA indices of export shares in textiles trade are low for majority of the developed economies. Out of the 14 developed countries in the sample, about seven possessed comparative disadvantage in textiles throughout the entire period including Australia, Canada, Germany, UK and the US. Some other economies such as Austria, Netherlands, Spain and Switzerland lost their comparative advantage by the end of 1980s and over the 1990s (Table 1). Despite these falling patterns of RCA indices in many of these economies, there has been strong evidence of sustained comparative advantage for Belgium-Luxemburg, Italy and Portugal over 1981-2005.

INSERT TABLE 1 HERE

In Table 1, following Wadud (2007), the RCA estimates for the developing economies have been categorised separately from the Asian Newly Industrialised Economies (NIEs). Note that the four economies comprised in the group of Asian NIEs possess mixed development and political status, with South Korea being an OECD economy lately and Hong Kong being a part of China since 1997. As Table 1 shows, except Singapore that possesses no comparative advantage, the remaining three Asian NIEs record high comparative advantage in textiles trade throughout the period. The evidence of continued and growing comparative advantage is more robust for other developing economies from Asia (Table 1). The rest of the developing economies possess comparative advantages, *albeit* with different changing patterns. For example, RCA indices of Bangladesh, China and Thailand declined from high 1.22, 0.81 and 0.59 in 1981 to 0.04, 0.33 and 0.07 in 2005, respectively; while those of Indonesia and Pakistan increased from 0.04 and 1.14 in 1981 to 0.49 and 1.29 in 2005, respectively. Philippines recorded no comparative advantage over the period, while Malaysia enjoyed marginal advantages in 1981 and then lost by mid 1980s onwards, with indices declining continuously till 2005. These results are mostly similar to Wadud's (2007) estimates except for the fact that these estimates are free from understatement (or overstatement) of the indices inherent in Wadud's (2007) study due to methodological biases discussed earlier.

INSERT TABLE 2 HERE

Table 2 reports the RCA indices in clothing trade. The table shows that except Italy and Portugal, all other developed economies did not enjoy any comparative advantage in clothing. Italy and Portugal possessed a sustained comparative advantage over the entire period. However, the magnitude of their advantages declined slightly in 2000s. Among the Asian NIEs, Hong Kong recorded comparative advantages throughout the period, while the other three economies lost their advantages by early 1990s (Table 2). Within the group of other developing economies, Malaysia lost its comparative advantages by the end of 1990s. All other developing economies recorded high RCA indices. Some of these economies such as Bangladesh and Pakistan made great strides as their RCA indices improved from -0.534 and 0.417 in 1981 to 1.369 and 0.866 in 2005, respectively. Clearly, comparative advantage in clothing trade appears to be tilted towards low wage economies. Since the clothing industries are typically more labour intensive than textiles, comparative advantage of these low wage economies in clothing products is expected to have sourced from their cost competitiveness. On the contrary, rising labour cost seems to have subscribed significantly towards declining export ratios in clothing trade for developed economies as well as for some Asian high-income economies such as Singapore, Taiwan and South Korea. These findings are generally in accord with those of the studies by Wadud (2007) and Kilduff Ting (2006).

Dynamic measures

The RCA indices of relative change, given by equation (3), capture the dynamics of comparative advantage over the specified periods.[37] These measures are provided in Table 3 for textiles and clothing industries. Following Balassa (1965) and Wadud (2007), these dynamic indices are measured to account for changes from the 1980's to 2005, by taking average over relative export shares of first three years, viz., 1980 to 1982 and of the last three years, from 2003 to 2005.[38]

INSERT TABLE 3 HERE

The RCA indices reported in Table 3 show that out of fourteen developed economies, Italy and Portugal possessed dynamic comparative advantage in both textiles and clothing trade; and Spain record comparative advantage in textiles. The other developed economies have comparative disadvantages, as indicated by their negative RCA indices (Table 3). The magnitude of such disadvantages is higher in clothing relative to textiles. This result shows greater declines in comparative advantage of the developed high income economies in clothing compared to textiles trade. Among the Asian NIEs, comparative advantages in textiles are attained by Hong Kong,

say textiles is as large as its global share of total manufacturing exports, and hence, does not indicate comparative advantage.

[37] These dynamic RCA indices provide further insights of the relative change of comparative advantage over time and are free from any short-term random effects.

[38] Although the choice of three year period to derive the relative RCA change is arbitrary, this methodology conforms to Balassa's original work that examined change in the average relative share of exports from 1953-55 to 1960-62.

Taiwan and South Korea, with disadvantage recorded by Singapore in both textiles and clothing (Table 3). Note that in this group, only Hong Kong possesses sustainable advantages in clothing and the other three nations converge to similar magnitude of disadvantages (with indices ranging from -0.71 to -0.78). For the other developing economies, more interesting patterns are observed in textiles trade. Dynamic comparative disadvantage is recorded by Malaysia and low wage economies such as Bangladesh and Philippines; while comparative advantages are recorded by the others led by Pakistan and India, with high RCA indices of 1.34 and 0.67, respectively. In clothing trade, except Malaysia and Thailand, the rest of the developing economies possess strong dynamic comparative advantages led by Bangladesh (1.50), Pakistan (1.1) and Indonesia (0.46). It would be worth noting a couple of observations at this stage. Firstly, while dynamic advantages in both textiles and clothing are retained by low wage developing economies including China, India, Indonesia and Pakistan, advantages in clothing are combined with disadvantages in textiles for economies such as Bangladesh and Philippines (Table 3). This could also be indicative of the dwindling role of textiles both as an export oriented industry as well as a backward linkage for the high-growth clothing sector in these economies. Secondly, Malaysia's dynamic disadvantages in both textiles and clothing; and Thailand's advantages in textile by a paltry 3.6% combined with disadvantage in clothing trade, are indicative of transformation these economies have been undergoing through changing industry specialisations (Table 3).

Following Wadud (2007), all the countries have been ranked in the descending order in 1981 and in 2005 (Table 1, Table 2 and Table 3). The details of the rankings and change over time are present in Table A1 and A2 in the appendix, for textiles and clothing, respectively. In textiles trade, over 1981-2005, 12 and 13 economies saw improved and deteriorated RCA ranking (Table 1). In clothing trade, as shown in Table 2, comparative advantage ranks improved and fell for 13 and 10 countries, respectively. Note that all the Asian NIEs and three South Eastern economies (Malaysia, Thailand and Philippines) recorded declines in the rankings (Table 2). In contrast, the five low wage economies in Asia (Bangladesh, Pakistan, Indonesia, India and China) acquire the top 5 places in 2005. The overall ranks are reported in Table 3 based on the dynamic RCA indices. Three Asian NIEs, two developed and five developing economies represent the groups of top ten countries with comparative advantage in textiles trade (Table 3). In clothing, seven developing economies are placed in the top ten, along with Hong Kong, Portugal and Italy. Clearly, Italy and Portugal, unlike other developed high income economies have maintained their comparative advantage in both industries.

INSERT TABLE 4a HERE

In order to examine how the country specific income relate to those based on comparative advantages, rank correlations are estimated with countries ranked based on their per capita income and the RCA indices in textiles and clothing industries for three selected years, 1981, 1990 and 2005 (Table 4a). As the table shows, there are significant negative correlations between income status and RCA indices for both the industries, implying that lower income countries possess higher comparative advantages and vice versa (Table 4a). For textiles, the magnitude of negative correlation went down from about 62% in 1981 to 43 % in 2005, while for clothing such magnitudes sustained at about 63% with an absolute increase in 1990 (75%). In table 4b, the rank correlation coefficients are significantly estimated as 45% and 68% for textiles and clothing, respectively. These estimates indicate that in a dynamic perspective, while lower (higher) income countries seem to have higher (lower) comparative advantages in both textiles and clothing, the magnitude of such inverse relationship is about 20% higher in clothing compared to textiles (Table 4b).

INSERT TABLE 4b HERE

The patterns of RCA indices of textiles and clothing for the three country groups have been plotted in Figure 1 and Figure 2. Figure 1 shows that the RCA indices for the developing countries decline from below 50% in 1981 to below 30% in 2005. These changes are reflections of a fall in RCA index of the developing economies excluding the NIEs (Asian NIEs) from about 70% (30%) in 1981 to above 30% (10%) in 2005. There seems to be a convergence of the comparative advantages in textiles between the Asian NIEs and the other developing economies by the end of the 1990s, following which a continuing and faster fall in comparative advantage is predicted (Figure 1). For the developed economies, comparative disadvantage is plotted throughout the period, deteriorating slightly from the mid 1990s.

INSERT FIGURE 1 HERE

Figure 2 shows that comparative advantages in clothing trade declined steadily for the developing economies from about 70% in 1981 to about 30% in 2005. Further scrutiny reveals that the fall in RCA indices for the developing economies except the NIEs is much smaller than the fall in indices for the Asian NIEs. In fact, while the other developing economies possess somewhat high and steady advantages in recent years, the Asian NIEs see a perpetual decline with their comparative advantage in clothing trade virtually being lost in 2005 (Figure 2). The developed economies have comparative disadvantage over the entire period, however, with little or no deterioration since the mid 1990s. The RCA line for the group of all developing economies closely associates with that of the group of developing economies without NIEs,

reflecting dominance of the lower and middle income economies in global clothing exports from developing world (Figure 2). In both the Figure 1 and Figure 2, the dotted vertical line drawn somewhere in the middle of the horizontal axes of the diagrams show the inception of the ten-year phase out of the MFA under the auspices of the WTO. The benefits of such liberalisations are somewhat apparent with the RCA growth lines of textiles and clothing tending to flatten out for the developed and the low wage developing economies.

INSERT FIGURE 2 HERE

Intra-Industry Trade and comparative advantage

Wadud (2007) estimated the GL indices for trade in textiles and clothing for all the selected developed and developing economies from 1980 till 1996. In this study, we extended these estimates upto 2005. These are reported in Table 5 and Table 6 for selected year, for textile and clothing industries, respectively. In both these tables we reproduced Wadud's (2007) estimates available till 1996 and reported our estimates for the 1997-2005 period. Table 5 shows high GL indices in recent years for a number of developed countries including Austria, France, Germany, Japan, Portugal, Netherlands, Spain and Switzerland, implying that textiles trade in these economies are mainly intra industry type. A move towards IIT in textiles is also evident for Hong Kong and Singapore (Table 5). For most other developing economies, textiles trade seems to have been dominated by comparative advantage.

INSERT TABLE 5 HERE

Wadud (2007) suggested that developed economies such as Belgium-Luxembourg, Germany, Italy, Netherlands and Portugal moved towards IIT in clothing trade. This is further supported by Table 6 as the GL indices for these economies keep on rising over 1997-2005. On the contrary, Austria, France, Japan and UK seem to have moved towards clothing trade with reduced IIT and increased comparative advantages (Table 6). The GL indices also show that comparative advantages dominate the clothing trade in Australia and the US. Among the Asian NIEs, three countries (except Singapore) show a major shift away from inter industry to IIT in clothing (Table 6). Of these, South Korea and Taiwan shifted from pure comparative advantage based trade to trade with high levels of product differentiations. In contrast, as shown by Wadud (2007), the rest of the developing economies overwhelmingly depend on trade based on comparative advantage. For most of the period, the G-L indices are less than 10% and are occasionally close to zero for almost all the developing low wage economies, as many of these economies record high clothing exports with little or no imports of the products (Table 6). All four Asian NIEs show significant move towards IIT, from 1981 to 2005.

INSERT TABLE 6 HERE

Factors explaining comparative advantage

The estimated results of the panel regression model of RCA indices given by equation (4) have been presented in Table 7 and Table 8, for textiles and clothing industries, respectively. For each industry, two equations have been estimated, with and without capital as an explanatory variable. For textiles industry, the Hausman specification test is found insignificant for both the equations, and hence a random effect model was justified for the dataset (Table 7). The random effects panel estimates of the coefficients for textiles provide mixed evidence. In the first regression with capital included in the explanatory vector, the estimated coefficients of both *w* and *F* are significant. However, estimated coefficients of *K* and *S* are insignificant. In the second regression that excludes *K*, factor proportions or the capital labour ratio is the only variable that appears to significantly affect the comparative advantages in textiles trade (Table 7). Overall, coefficient estimates of *w* show that the impact of wages on comparative advantage seems to be insignificant (eq. 2 in Table 7) and small (in both regressions in Table 7). Similarly, estimates show that comparative advantage in textiles industries in various countries does not depend on the industry sizes. However, capital-labour ratio is found to be the most significant factor affecting the RCA indices. The negative estimate of the coefficient of this variable implies an average decline in comparative advantage if capital-labour ratio rises (Table 7). This further suggests that although productive processes in textiles are characteristically more capital-intensive compared to clothing industry, growth of such capital deepening operations may not necessarily prove to be effective for improving or retaining comparative advantage in textiles.

For clothing industry, the Hausman specification test is insignificant for regression 1 and significant only at 10% level for regression 2. Hence, the random effect model is also justified for the clothing industry panel model. In both the regressions, estimated coefficients of wage rate are highly significant and negative. This implies that on average lower wages are associated with higher comparative advantage in clothing trade and is an expected result (Table 8). In the first regression, while capital labour ratios are insignificant, both capital stock and size of industries exert significantly negative and positive effect, respectively. Hence, countries with higher stock of capital in clothing industries tend to possess lower comparative advantage, and vice versa. Conversely, comparative advantage is higher for countries with bigger clothing industries. This evidence is also supported by estimate of regression 2 (Table 8). The regression 2 estimates also indicate that capital labour

ratio is negatively related with RCA indices. Overall, the results of the panel regression of the RCA indices of the clothing industry show that in both static and dynamic terms, comparative advantage in clothing is tilted towards countries with lower wages, larger industries and reduced industry capital stock or capital labour ratios (Table 8).

IV. Conclusions

We examined the levels and shifting patterns of comparative advantage in textiles and clothing trade, and the factors that have been driving such patterns across trading nations of different development status. The paper revises the estimates of RCA indices reported by Wadud (2007) by incorporating the total manufacturing exports. The estimates of the RCA indices are also extended till 2005, in an effort to encompass the years of trade liberalisations under the auspices of the WTO such as the phasing out of the MFA type restrictions. The study adds further insights into factors that explain the dynamics in comparative advantage in both textiles and clothing trade using econometric modelling in a longitudinal perspective. The findings of this study show that about half of the developed economies in our sample possess comparative disadvantage in textiles trade, few others lost their comparative advantages by the 1990s and three economies (Italy, Portugal and Belgium-Luxembourg) retained comparative advantage over the period. In contrast, most of the developing economies including the Asian NIEs recorded high RCA. Despite this, a changing pattern has been apparent as the magnitude of such advantages dwindled or increased for few low wage economies. In clothing trade, except Italy and Portugal, the rest of the developed high income economies possess comparative disadvantages. Three of the Asian NIEs lost comparative advantage in clothing over time, which is partially mirrored in the rising comparative advantages of the other developing economies, with some recording phenomenal growth. The overall dynamic measures show similar results, with comparative advantage generally tilting towards developing economies and with most developed economies including the Asian NIEs being relatively less disadvantaged in textiles. We also find significant negative correlation between ranks of countries based on income level and comparative advantages in both textiles and clothing trade; and that magnitude of such negative relationships declined over time for textiles. We find evidence of a general move of the developed economies in textiles towards IIT and in clothing, towards both IIT and inter industry trade in recent years. A mixed shifting pattern of IIT is also evident in the developed economies and the Asian NIEs in clothing trade. However, most low wage developing economies rely on their comparative advantages in trade in both the products. Using estimates of random effect panel models for the industries, we find that countries with higher capital labour ratio tend to attain a lower comparative advantage; and that wage rates, industry sizes insignificantly affect comparative advantages in textiles. Our results also show comparative advantage in clothing rises with lower wage rates. Countries with bigger industries and higher industry capital stock tend to possess higher and lower comparative advantages in clothing, respectively. Adverse effects of capital labour ratio on comparative advantage in clothing are also identified.

The above findings are generally in accord with those of Wadud (2007) and Kilduff and Ting (2006). However, the contribution of this study emanates from the methodology and scope adopted in this study, correcting the estimation biases as well as explaining the country and industry specific factors affecting comparative advantages. It is evident that higher labour cost is a clear bar for attaining comparative advantage for the trading nations, a result that contradicts Wadud's (2007) general conclusion. The developed economies with their technological sophistications and innovative skills tend to rely more on trade with product differentiation rather than on comparative advantage. This phenomenon is more pronounced in textiles trade. For developing low wage economies, comparative advantage could be sustained based on labour intensive processes. However, these economies are likely to move towards trade with product differentiations along the path of industrialisation, following the trails of the Asian NIEs. It is also likely that selected developing economies will stand out with their sustained comparative advantage in both textiles and clothing, in a manner exhibited by Italy and Portugal with the niche markets created based on quality and traditional skill orientations. As we find in the growth pattern of country groups, convergence and competitions for market share among the trading nations are expected to intensify with the advent of the current liberalised trade regime. There are also important implications of findings of this study for the firms in the textiles and clothing industries in various economies, especially for those relaying on export led growth and profits. It is expected that prudent management of the firms that would optimise firm sizes, factors used and product quality would be highly rewarding with sustained international market shares.

References

1. Ariovich, G. (1979), The comparative advantage of South Africa as revealed by export shares. *The South African Journal of Economics*, 47(2), 188-197.
2. Balassa, Bela. (1965). Trade liberalization and revealed comparative advantage. *The Manchester School*, 33(2), 99-123.
3. Balasubramanyam, V. N. and Wei, Y. (2005), 'Textiles and Clothing exports from India and China: A Comparative analysis', *Journal of Chinese Economic and Business Studies*, Vol. 3, No. 1, pp. 23-37.
4. Bender, S. and Li, Kui-Wai. (2002), The changing trade and revealed comparative advantages of Asian and Latin American manufacture exports. *Yale Economic Growth Center Discussion Paper: 843*, p.24.

5. Chipman, J. S. (2008), *The Theory of International Trade: Volume 1*, Economists of the Twentieth Century series. Cheltenham, U.K. and Northampton, Mass.: Elgar.
6. Cinquetti, Carlos, A. (2008), Multinational and exports in a large and protected developing country, *Review of International Economics*, Vol. 16, no. 5, pp. 904-18.
7. Claudon, M. P. (1977), *International trade and technology: models of dynamic comparative advantages*, Washington D.C.: University Press of America.
8. Crafts, N.F.R. and Thomas, M. (1986), 'Comparative advantage in the UK manufacturing trade, 1910- 1935, *Economic Journal*, Vol., 96, pp. 629-45.
9. Deardorff, Alan V. (1980), The General Validity of the Law of Comparative Advantage, *Journal of Political Economy*, Vol. 88, no. 5, pp. 941-57
10. Ferto, I. and Hubbard, L. J. (2003), Revealed comparative advantage and competitiveness in Hungarian Agri-food Sectors. *World Economy*, 26 (2), 247-59.
11. Fitgerald, D., and Hallack, J. C. (2004), 'Specialization, factor accumulation and development', *Journal of International Economics*, Vol. 64, No. 2, pp. 277-302
12. Grubel, H.G. and Lloyd, P.J. (1975*). Intra-industry trade: the theory and measurement of international trade in differentiated products*, London: Mcmillan Press.
13. Havrilla, I. and Gunawardana, P. (2003), Analysing comparative advantage and competitiveness: an application to Australia's textile and clothing industries, *Australian Economic Papers*, 42(1), 103-117.
14. Hirsch, S. (1975). The product cycle model of international trade- a multi-country cross-section analysis, *Oxford Bulletin of Economics and Statistics*, 137(4), 305-317.
15. Kilduff, P. and Ting, C. (2006), Longitudinal patterns of comparative advantage in the textiles complex-part 1, *Journal of Fashion Marketing and Management*, Vol. 10, No. 2, pp. 132-59.
16. Klein, Roger W. (1973), A dynamic theory of comparative advantage. *American Economic Review*, 63(1), 173-184.
17. Lee, Jaimin (1995), Comparative advantage in manufacturing as a determinant of industrialization: The Korean Case, *World Development*, 23(7), 1195-1214.
18. Olga, M. (1994), On the theory and measurement of comparative advantage: an empirical analysis of Yugoslav trade in manufactures with the OECD countries, 1970-1986, *Tinbergen Institute Research Series*, 65, Amsterdam.
19. Peterson, John (1988), Export shares and revealed comparative advantage. A study of international travel, *Applied Economics*, 20(3), 351-365.
20. Petri, Peter A. (1988). Korea's export niche: origins and prospects. *World Development*, 6(1), 47-63.
21. Pigato, M., Farah, C., Itakura, K., Kwang J. and Srinivasan T.G. (1997), *South Asia's Integration into The World Economy*, Washington D.C.: World Bank.
22. Reza, Sadrel (1983), Revealed comparative advantage in the South Asian manufacturing sector: some estimates. *Indian Economic Journal*, 31(2), 96-106.
23. Rodas-Martini, P. (1998), 'Intra-Industry trade and revealed comparative advantage in the Central American common market, *World Development*, Vol. 26, No. 2, pp. 337-344.
24. Rostow, W. W. (1960), *The Stages of Economic Growth: A Non-Communist Manifesto*, Cambridge: Cambridge University Press.
25. Vernon, Raymond (1966), International investment and international trade in the product cycle, *Quarterly Journal of Economics*, 80, 190-207.
26. Vernon, Raymond (1979), The product cycle hypothesis in a new international environment, *Oxford Bulletin of Economics and Statistics*, 41(4), 255-267.
27. Vollrath, T. L. (1991), A Theoretical Evaluation of Alternative Trade Intensity Measures of Revealed Comparative Advantage, *Weltwirtschafliches Archiv*, vol. 127, pp. 265–279.
28. Wadud, IKM. M. (2007), A cross country analysis of dynamics in comparative advantage and trade patterns in textiles and clothing, *Labuan Bulletin of International Business & Finance*, Vol. 5, pp. 1-22.
29. Wood, A. (1994), *North-SouthTrade, Employment and Inequality*, Clarendon Press, Oxford.
30. Yeats, Alexandar (1991), China's foreign trade and comparative advantage: prospects, problems, and policy implications, *World Bank Discussion Papers No. 141*, Washington, D.C.: World Bank.

Appendices

Table 1. Revealed Comparative Advantage in Textiles Trade: Indices of Export Shares

Countries	1981	1984	1987	1990	1993	1997	2000	2002	2005	Rank	
										1981	2005
Developed Economies											
Australia	-0.064	-0.008	-0.028	-0.296	-0.250	-0.144	-0.165	-0.250	-0.261	18	18
Austria	0.216	0.138	0.101	0.120	0.070	-0.010	-0.037	-0.079	-0.128	10	14
Belgium-Luxemburg	0.205	0.236	0.186	0.205	0.201	0.148	0.095	0.035	0.004	11	12
Canada	-0.718	-0.864	-0.762	-0.668	-0.585	-0.449	-0.425	-0.372	-0.366	26	24
France	-0.095	-0.074	-0.101	-0.065	-0.134	-0.121	-0.136	-0.145	-0.175	20	15
Germany	-0.118	-0.085	-0.090	-0.068	-0.076	-0.140	-0.173	-0.208	-0.274	21	19
Italy	0.124	0.177	0.163	0.167	0.181	0.198	0.229	0.225	0.223	12	8
Japan	-0.089	-0.156	-0.285	-0.311	-0.340	-0.358	-0.330	-0.318	-0.342	19	23
Netherlands	0.064	0.053	0.033	-0.067	-0.003	-0.119	-0.271	-0.281	-0.279	13	20
Portugal	0.586	0.543	0.406	0.367	0.343	0.336	0.387	0.415	0.310	6	5
Spain	0.012	0.024	-0.090	-0.085	-0.109	-0.012	0.007	0.012	-0.032	17	13
Switzerland	0.056	0.092	0.013	-0.007	-0.109	-0.182	-0.207	-0.255	-0.325	15	21
United Kingdom	-0.153	-0.168	-0.199	-0.165	-0.201	-0.224	-0.225	-0.243	-0.235	23	17
United States	-0.314	-0.432	-0.445	-0.401	-0.400	-0.367	-0.297	-0.239	-0.216	25	16
Asian NIEs											
Hong Kong (China)	0.344	0.350	0.419	0.396	0.321	0.336	0.320	0.300	0.250	8	7
South Korea	0.414	0.321	0.284	0.361	0.441	0.465	0.390	0.356	0.161	7	9
Singapore	-0.122	-0.188	-0.160	-0.258	-0.303	-0.513	-0.637	-0.666	-0.749	22	26
Taiwan	0.308	0.225	0.235	0.355	0.387	0.457	0.402	0.379	0.309	9	6
Other Developing Economies											
Bangladesh	1.220	1.185	0.850	0.814	0.618	0.530	0.365	-0.115	0.039	1	11
China	0.809	0.838	0.764	0.572	0.443	0.361	0.342	0.336	0.325	3	4
India	0.679	0.681	0.634	0.601	0.624	0.722	0.715	0.676	0.608	4	2
Indonesia	0.036	0.366	0.392	0.498	0.504	0.414	0.474	0.461	0.490	16	3
Malaysia	0.060	-0.090	-0.175	-0.304	-0.319	-0.255	-0.318	-0.387	-0.332	14	22
Pakistan	1.136	1.089	1.100	1.143	1.161	1.201	1.249	1.242	1.292	2	1
Philippines	-0.255	-0.543	-0.400	-0.267	-0.396	-0.388	-0.593	-0.624	-0.585	24	25
Thailand	0.593	0.539	0.344	0.164	0.086	0.103	0.054	0.073	0.072	5	10

Source: Author's calculation.

Table 2. Revealed Comparative Advantage in Clothing Trade: Indices of Export Shares

Countries	1981	1984	1987	1990	1993	1997	2000	2002	2005	Rank	
										1981	2005
Developed Economies											
Australia	-0.843	-0.905	-0.750	-0.501	-0.509	-0.422	-0.513	-0.582	-0.597	25	21
Austria	0.046	-0.003	-0.053	-0.147	-0.213	-0.229	-0.311	-0.368	-0.203	14	13
Belgium-Luxemburg	-0.220	-0.269	-0.312	-0.314	-0.286	-0.234	-0.218	-0.232	-0.194	18	12
Canada	-0.733	-0.906	-0.853	-1.005	-0.808	-0.600	-0.551	-0.536	-0.621	24	24
France	-0.140	-0.190	-0.213	-0.194	-0.257	-0.310	-0.327	-0.305	-0.228	15	15
Germany	-0.328	-0.338	-0.329	-0.333	-0.411	-0.416	-0.444	-0.448	-0.432	20	18
Italy	0.277	0.293	0.282	0.247	0.187	0.204	0.175	0.182	0.188	12	9
Japan	-0.971	-0.927	-1.198	-1.340	-1.415	-1.570	-1.550	-1.550	-1.619	26	26
Netherlands	-0.214	-0.284	-0.264	-0.206	-0.234	-0.290	-0.365	-0.322	-0.358	17	16
Portugal	0.732	0.723	0.790	0.771	0.686	0.592	0.512	0.463	0.424	4	6
Spain	-0.274	-0.296	-0.338	-0.498	-0.383	-0.395	-0.256	-0.187	-0.126	19	11
Switzerland	-0.443	-0.521	-0.617	-0.594	-0.659	-0.667	-0.701	-0.650	-0.532	21	19
United Kingdom	-0.157	-0.248	-0.280	-0.339	-0.334	-0.296	-0.375	-0.425	-0.360	16	17
United States	-0.634	-0.804	-0.830	-0.709	-0.541	-0.449	-0.500	-0.611	-0.742	23	25
Asian NIEs											
Hong Kong (China)	0.877	0.822	0.723	0.654	0.538	0.478	0.475	0.432	0.413	1	7
South Korea	0.748	0.634	0.578	0.459	0.224	-0.094	-0.113	-0.209	-0.577	3	20
Singapore	0.153	0.069	0.065	-0.028	-0.257	-0.491	-0.434	-0.440	-0.614	13	22
Taiwan	0.594	0.542	0.349	0.153	-0.009	-0.174	-0.294	-0.385	-0.618	8	23

Other Developing Economies											
Bangladesh	-0.534	0.513	1.017	1.072	1.156	1.235	1.306	1.322	1.369	22	1
China	0.702	0.773	0.742	0.684	0.714	0.666	0.591	0.515	0.449	6	5
India	0.626	0.608	0.612	0.650	0.577	0.583	0.628	0.552	0.499	7	4
Indonesia	0.593	0.613	0.524	0.605	0.572	0.467	0.504	0.471	0.528	9	3
Malaysia	0.286	0.230	0.277	0.264	0.091	-0.055	-0.168	-0.208	-0.203	11	14
Pakistan	0.417	0.556	0.643	0.708	0.754	0.738	0.824	0.785	0.866	10	2
Philippines	0.807	0.742	0.794	0.836	0.714	0.393	0.239	0.273	0.216	2	8
Thailand	0.729	0.754	0.736	0.631	0.516	0.307	0.237	0.199	0.109	5	10

Source: Authors' calculation.

Table 3. RCA Indices of Relative Change from Early 1980's to Mid 2000's

	Early 1980's to mid 2000's			
	Textiles	Rank	Clothing	Rank
Developed Economies				
Australia	-0.351	22	-0.389	16
Austria	-0.237	17	-0.391	17
Belgium-Luxemburg	-0.068	12	-0.194	12
Canada	-0.106	13	-0.452	19
France	-0.203	15	-0.306	13
Germany	-0.301	19	-0.475	20
Italy	0.259	6	0.135	8
Japan	-0.349	21	-1.773	26
Netherlands	-0.328	20	-0.380	15
Portugal	0.310	4	0.334	6
Spain	0.021	11	-0.082	11
Switzerland	-0.411	24	-0.564	21
United Kingdom	-0.229	16	-0.437	18
United States	-0.119	14	-0.711	23
Asian NIEs				
Hong Kong (China)	0.246	7	0.238	7
South Korea	0.132	9	-0.708	22
Singapore	-0.863	26	-0.749	24
Taiwan	0.308	5	-0.784	25
Developing Economies				
Bangladesh	-0.281	18	1.497	1
China	0.148	8	0.344	5
India	0.606	2	0.442	4
Indonesia	0.442	3	0.462	3
Malaysia	-0.386	23	-0.378	14
Pakistan	1.339	1	1.060	2
Philippines	-0.711	25	0.011	9
Thailand	0.036	10	-0.070	10

Source: Authors' calculation.

Table 4a. Rank Correlation Between Country Specific Income and Absolute RCA Indices

	1981		1990		2005	
	Correlation Coefficient	t-value	Correlation Coefficient	t-value	Correlation Coefficient	t-value
Textiles	-0.621	-3.876**	-0.519	-2.971**	-0.430	-2.332*
Clothing	-0.639	-4.069**	-0.755	-5.644**	-0.626	-3.932**

** Significant at 1 % level.

* Significant at 5 % level.

Source: Authors' calculation.

Table 4b. Rank Correlation Between Country Specific Income and Dynamic RCA Indices

	Correlation Coefficient	t-value
Textiles	-.450	-2.466*
Clothing	-.684	-4.595**

** Significant at 1 % level.

* Significant at 5 % level.

Source: Authors' calculation.

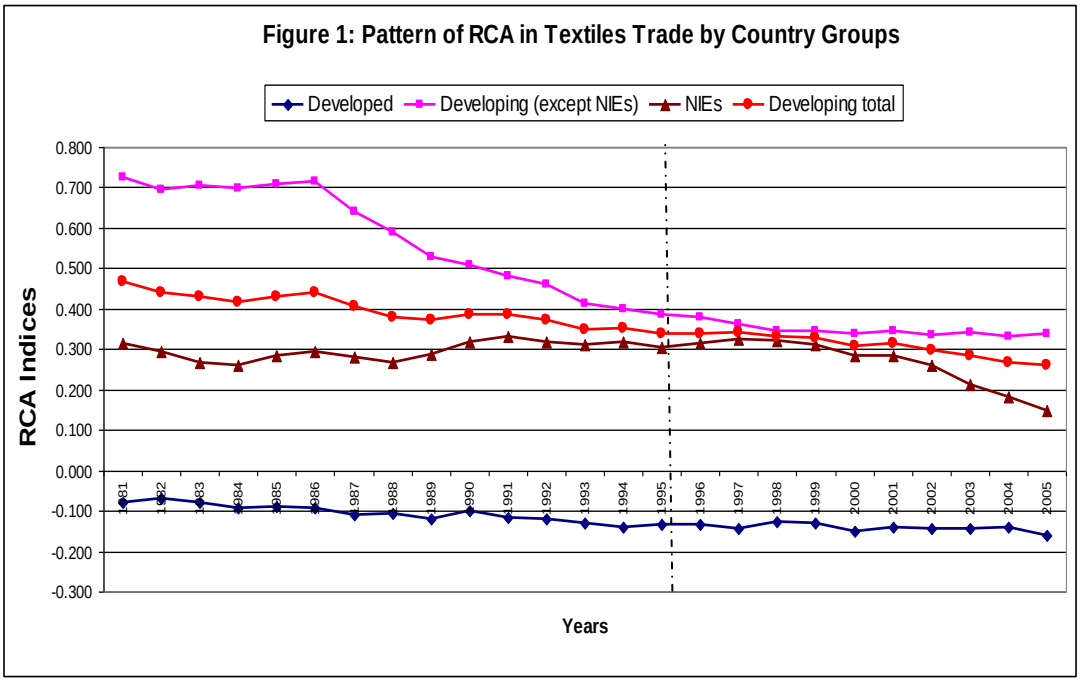
Figure 1: Pattern of RCA in Textiles Trade by Country Groups
Developed
Developing (except NIEs)
NIEs
Developing total
RCA Indices
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
-0.100
-0.200
-0.300
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Years

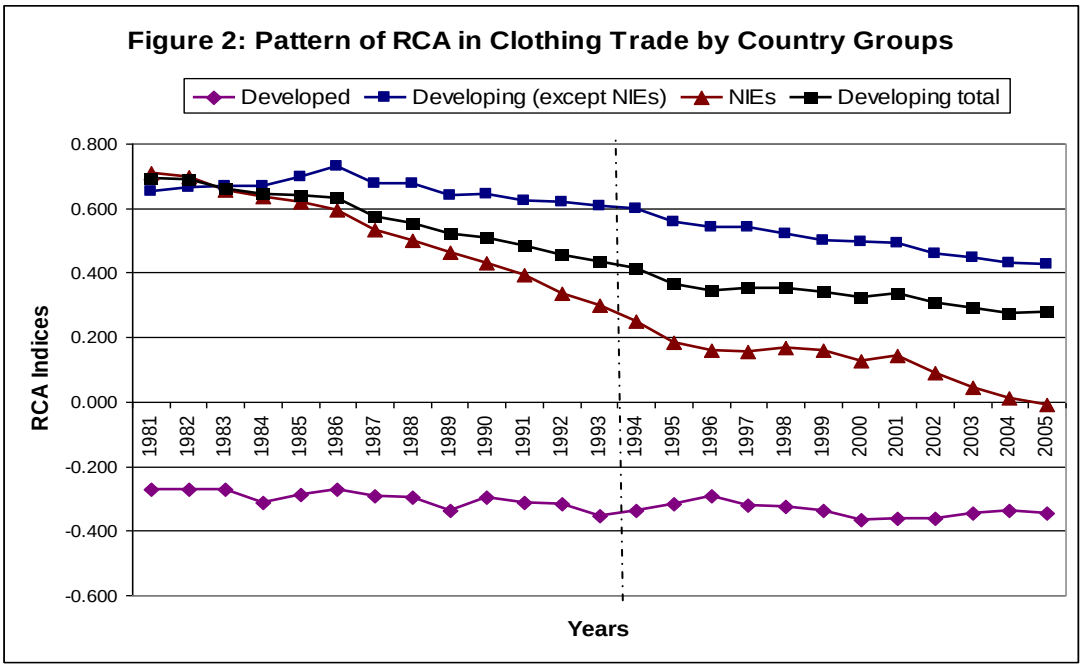
Figure 2: Pattern of RCA in Clothing Trade by Country Groups
Developed
Developing (except NIEs)
NIEs
Developing total
RCA Indices
0.800
0.600
0.400
0.200
0.000
-0.200
-0.400
-0.600
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Years

Table 5. Grubel-Lloyd Index of Intra Industry Trade in Textiles, 1981-2005

Countries	1981	1984	1987	1990	1993	1997	2000	2003	2005
Australia	0.228	0.203	0.251	0.191	0.277	0.416	0.351	0.314	0.314
Austria	0.953	0.981	0.986	0.972	0.973	0.959	0.940	0.947	0.994
Belgium-Luxemburg	0.762	0.750	0.730	0.719	0.677	0.737	0.726	0.712	0.725
Canada	0.376	0.332	0.382	0.456	0.528	0.646	0.696	0.741	0.726
France	0.920	0.913	0.865	0.887	0.944	0.982	0.994	0.998	0.958
Germany	0.979	0.933	0.903	0.916	0.932	0.928	0.960	0.936	0.945
Italy	0.655	0.683	0.754	0.785	0.626	0.666	0.681	0.664	0.666
Japan	0.437	0.530	0.697	0.826	0.739	0.924	0.825	0.878	0.914
Netherlands	0.955	0.976	0.984	0.892	0.911	0.886	0.992	0.940	0.863
Portugal	0.627	0.545	0.965	0.883	0.913	0.923	0.954	0.975	0.990
Spain	0.571	0.516	0.990	0.844	0.994	0.993	0.949	0.934	0.923
Switzerland	0.807	0.791	0.812	0.839	0.879	0.918	0.938	0.983	0.958
United Kingdom	0.805	0.697	0.692	0.769	0.788	0.781	0.805	0.822	0.799
United States	0.902	0.709	0.649	0.856	0.810	0.849	0.813	0.747	0.709
Asian NIEs									
Hong Kong (China)	0.778	0.790	0.874	0.893	0.934	0.948	0.990	0.994	0.999
South Korea	0.335	0.375	0.513	0.485	0.449	0.421	0.418	0.450	0.508
Singapore	0.552	0.558	0.632	0.674	0.770	0.838	0.831	0.957	0.938
Taiwan	0.278	0.329	0.300	0.284	0.318	0.255	0.219	0.225	0.206
Developing Economies									
Bangladesh	0.446	0.457	0.917	0.863	0.662	0.636	0.475	0.167	0.224
China	0.660	0.527	0.713	0.846	0.936	0.940	0.886	0.692	0.548
India	0.134	0.144	0.166	0.198	0.145	0.139	0.175	0.279	0.423
Indonesia	0.253	0.770	0.625	0.775	0.598	0.676	0.526	0.370	0.360
Malaysia	0.617	0.679	0.650	0.530	0.718	0.974	0.935	0.904	0.843
Pakistan	0.307	0.230	0.156	0.091	0.056	0.036	0.056	0.084	0.125
Philippines	0.322	0.194	0.210	0.253	0.250	0.406	0.384	0.403	0.391
Thailand	0.761	0.818	0.866	0.984	0.976	0.764	0.908	0.860	0.836

Source: Authors' calculation and Wadud (2007).

Table 6. Grubel-Lloyd Index of Intra Industry Trade in Clothing, 1981-2005

Countries	1981	1984	1987	1990	1993	1997	2000	2003	2005
Australia	0.084	0.068	0.131	0.243	0.265	0.311	0.191	0.179	0.124
Austria	0.822	0.747	0.718	0.665	0.591	0.638	0.612	0.609	0.694
Belgium-Luxemburg	0.692	0.734	0.702	0.716	0.724	0.831	0.884	0.915	0.921
Canada	0.429	0.309	0.338	0.242	0.417	0.662	0.720	0.608	0.475
France	0.880	0.833	0.705	0.716	0.686	0.665	0.643	0.641	0.640
Germany	0.519	0.544	0.553	0.557	0.409	0.495	0.532	0.613	0.654
Italy	0.298	0.240	0.312	0.358	0.496	0.527	0.629	0.724	0.790
Japan	0.473	0.557	0.241	0.122	0.097	0.055	0.053	0.051	0.043
Netherlands	0.076	0.036	0.111	0.222	0.377	0.409	0.514	0.579	0.693
Portugal	0.476	0.517	0.531	0.629	0.619	0.744	0.674	0.785	0.805
Spain	0.696	0.478	0.914	0.532	0.652	0.666	0.703	0.674	0.607
Switzerland	0.381	0.324	0.290	0.333	0.317	0.329	0.322	0.424	0.433
United Kingdom	0.743	0.662	0.680	0.608	0.627	0.644	0.483	0.420	0.390
United States	0.277	0.116	0.104	0.174	0.244	0.294	0.228	0.144	0.118
Asian NIEs									
Hong Kong (China)	0.293	0.357	0.475	0.619	0.720	0.788	0.796	0.816	0.806
South Korea	0.005	0.007	0.006	0.038	0.110	0.499	0.413	0.823	0.940
Singapore	*0.591*	0.723	0.677	0.734	0.930	0.905	0.985	0.959	0.886
Taiwan	0.004	0.004	0.015	0.136	0.274	0.454	0.490	0.563	0.823
Developing Economies									
Bangladesh	0.053	0.053	0.019	0.043	0.009	0.026	0.090	0.155	0.000
China	0.068	0.004	0.006	0.010	0.058	0.068	0.064	0.053	0.043
India	0.001	0.001	0.003	0.001	0.002	0.004	0.008	0.014	0.016
Indonesia	0.199	0.033	0.016	0.019	0.013	0.024	0.016	0.013	0.027
Malaysia	0.393	0.307	0.133	0.109	0.123	0.124	0.123	0.154	0.205
Pakistan	0.005	0.014	0.004	0.001	0.001	0.003	0.004	0.009	0.015
Philippines	0.009	0.011	0.006	0.016	0.030	0.072	0.058	0.071	0.082
Thailand	0.021	0.041	0.010	0.020	0.022	0.071	0.067	0.083	0.099

Source: Authors' calculation and Wadud (2007).

Table 7. Estimated Relationship between Revealed Comparative Advantage, Wage Rate and Capital-Labour Ratio, 26 Countries, Textiles Sector, Random Effects Panel Regression, 1981- 2005

Dependent Variable is Revealed Comparative Advantage for both the regressions				
Explanatory Variables	Estimated Random Effect Coefficients (1)	P-values (1)	Estimated Random Effect Coefficients (2)	P-values (2)
Constant	4.11*** (4.50)	0.000	4.20*** (4.48)	0.000
Wage Rate (w)	-0.00002* (1.85)	0.065	-0.00002 (-1.46)	0.142
Capital (K)	0.0000 (1.44)	0.150	…..	…..
Factor proportion (F)	-1.75e-08*** (11.85)	0.000	-1.84e-08*** (-2.086)	0.000
Size (S)	-2.56-12 (-0.0257)	0.797	6.45e-12 (0.78)	0.435
Number of Observations for both the regressions: 328				

Note: *** = significant at 1%, ** = significant at 5%, * = significant at 10%
Hausman specification Test for regression (1 & 2): $\chi^2 = 0.00$, P-Value: 1.00
Hausman Specification Test is insignificant and hence, Random Effects regression is suitable for this dataset.
Source: Authors' calculation

Table 8. Estimated Relationship between Revealed Comparative Advantage and Wage Rate and Capital-Labour Ratio, 26 Countries, Clothing Sector, Random Effects Panel Regression, 1981- 2005

Dependent Variable is Revealed Comparative Advantage for both the regressions				
Explanatory Variables	Estimated Random Effect Coefficients (1)	P-values (1)	Estimated Random Effect Coefficients (2)	P-values (2)
Constant	3.17* (7.38)	0.000	3.21*** (7.60)	0.000
Wage Rate	-0.00001*** (-3.19)	0.001	-0.00009*** (-2.64)	0.008
Capital	-3.94e-10**(-2.03)	0.043	…..	…..
Capital-Labour Ratio	-3.21e-06 (-0.01)	0.882	-0.00002* (- 1.67)	0.094
Output	9.47e-11** (2.14)	0.033	1.65e-11 (0.74)	0.462
Number of Observations for both the regressions: 317				

Note: *** = significant at 1%, ** = significant at 5%, * = significant at 10%
Hausman specification Test for regression (1): $\chi^2 = 4.86$, P-Value: 0.302
Hausman specification Test for regression (2): $\chi^2 = 6.52$, P-Value: 0.089
Hausman Specification Test is insignificant in regression (1) and significant at 10% in regression (2) and hence, Random Effects regression could be justified for this dataset for clothing sector as well.
Source: Authors' calculation

APPENDIX 2

Table A1. Trend of RCA Ranking in Textiles for Selected Economies (1981-2005)

Countries	1981	1984	1987	1990	1995	2000	2002	2005
Developed Economies								
Australia	18	17	16	22	19	16	19	18
Austria	10	13	13	13	13	14	13	14
Belgium-Luxemburg	11	10	11	10	11	11	11	12
Canada	26	26	26	26	26	24	23	24
France	20	18	19	15	17	15	15	15
Germany	21	19	18	17	16	17	16	19
Italy	12	12	12	11	10	10	9	8
Japan	19	21	23	24	23	23	22	23
Netherlands	13	15	14	16	14	20	21	20
Portugal	6	5	6	7	9	6	4	5

Spain	17	16	17	18	15	13	12	13
Switzerland	15	14	15	14	18	18	20	21
United Kingdom	23	22	22	19	20	19	18	17
United States	25	24	25	25	24	21	17	16
Asian NIEs								
Hong Kong (China)	8	8	5	6	8	9	8	7
South Korea	7	9	9	8	7	5	6	9
Singapore	22	23	20	20	25	26	26	26
Taiwan	9	11	10	9	5	4	5	6
Other Developing Economies								
Bangladesh	1	1	2	2	3	7	14	11
China	3	3	3	4	6	8	7	4
India	4	4	4	3	2	2	2	2
Indonesia	16	7	7	5	4	3	3	3
Malaysia	14	20	21	23	21	22	24	22
Pakistan	2	2	1	1	1	1	1	1
Philippines	24	25	24	21	22	25	25	25
Thailand	5	6	8	12	12	12	10	10

Source: Author's calculation

Table A2. Trend of RCA Ranking in Clothing for Selected Economies (1981-2005)

	1981	1984	1987	1990	1995	2000	2002	2005
Developed Economies								
Australia		24	23	22	21	23	23	21
Austria	14	15	15	15	14	16	17	14
Belgium-Luxemburg	18	18	19	18	18	13	14	12
Canada	24	25	25	25	25	24	22	24
France	15	16	16	16	15	17	15	15
Germany	20	21	20	19	20	21	21	18
Italy	12	12	12	12	10	10	10	9
Japan	26	26	26	26	26	26	26	26
Netherlands	17	19	17	17	16	18	16	16
Portugal	4	5	3	3	3	5	6	6
Spain	19	20	21	21	19	14	11	11
Switzerland	21	22	22	23	24	25	25	19
United Kingdom	16	17	18	20	17	19	19	17
United States	23	23	24	24	23	22	24	25
Asian NIEs								
Hong Kong (China)	1	1	6	6	8	7	7	7
South Korea	3	6	9	10	11	11	13	20
Singapore	13	14	14	14	22	20	20	22
Taiwan	8	10	11	13	13	15	18	23
Other Developing Economies								
Bangladesh	22	11	1	1	1	1	1	1
China	6	2	4	5	4	4	4	5
India	7	8	8	7	5	3	3	4
Indonesia	9	7	10	9	7	6	5	3
Malaysia	11	13	13	11	12	12	12	13
Pakistan	10	9	7	4	2	2	2	2
Philippines	2	4	2	2	6	8	8	8
Thailand	5	3	5	8	9	9	9	10

Source: Author's calculation

[1] The codification of the Accounting Control Act (BilKoG) in 2004 and the German Corporate Governance Code (DCGK) are among the most important of them.
[2] About the residual income approach, see *Penman/Sougiannis* (1998).
[3] For more details on the earnings multiple approach, see *Schreiner/Spremann* (2007).
[4] See e.g. *Gassen/Sellhorn* (2006), *Barth et al.* (2008) and also particularly the discussion in *Section 3*.
[5] For an overview of earnings quality research please refer to *Dechow/Schrand* (2004).
[6] For a detailed discussion of different legal systems and their impact on companies, see *La Porta et al.* (1998).
[7] See for some recent evidence *Kaserer/Klingler* (2008).
[8] See *Francis et al.* (2004), p. 969.
[9] Accruals in this context are defined as any accrued recognition of cash flows in those periods in which the respective activity took place. This includes, e.g., the capitalization of assets aimed at future depreciation, the creation of reserves or of deferred income or charges, etc. See *Dechow/Schrand* (2004), pp. 10
[10] See again *Francis et al.* (2004), p. 969.
[11] See e.g. *Lev* (1983).
[12] See e.g. *Lipe* (1990). Instead of the goodness-of-fit measure, accounting literature often applies, or at least suggests to apply, the standard error of regression for a comparison of different samples. See *Francis et al.* (2004), *Gassen/Sellhorn* (2006) and *Gu* (2007).
[13] See *Barth et al.* (2001a).
[14] See *Francis/Smith* (2005).
[15] See e.g. *Leuz et al.* (2003) and *Francis et al.* (2004).
[16] See *Bhattacharya et al.* (2003), *Leuz et al.* (2003) and *Dechow/Skinner* (2000). Accounting literature offers numerous alternative conceptual methods for the identification of earnings management. See also *Section 3*.
[17] See among others *Collins et al.* (1997) and *Francis/Schipper* (1999).
[18] See *Bushman et al.* (2004) and *Ball et al.* (2000).
[19] About the estimation approach according to *Basu* (1997), see also *Section 4.2*.
[20] *Barth et al.* (2008) compare earnings quality according to IAS/IFRS with earnings quality of the accounting regulations valid in 21 nations (the so-called Domestic GAAP). Since Germany is represented with 65 companies (approximately 20%) of altogether 327 companies, the results of this study can well be deemed as representative for earnings quality in Germany. Possible biases due to the accounting regulations of other nations have to be taken into account.
[21] See also the overview on the development of financial accounting of German listed companies between 1993 and 2004 in *Gassen/Sellhorn* (2006), p. 372.
[22] From a methodological perspective, winsorization is usually preferable to the elimination of data. See *Field* (2005), pp. 74 cont.
[23] By winsorizing on a 1- and 99-percentile, those values which are below the 1-percentile and those above the 99-percentile are set on the value of the respective percentile.
[24] See *Gu* (2007), p. 1079 and *Kennedy* (2008), pp. 27-28.
[25] See again the overview of the development of accounting practices of German listed companies between 1993 and 2004 by *Gassen/Sellhorn* (2006), p. 372.
[26] See among others *Kennedy* (2008), pp. 282.
[27] The neglecting of firm fixed effects is often explained by an inadequate sample size. See e.g. *Gassen/Sellhorn* (2006), p. 377.
[28] See *Section 3*.
[29] See *Section 4.2*.
[30] See *Section 3*.
[31] See *Barth et al.* (2001b)..
[32] For a criticism of the measure of value relevance see also *Holtshausen/Watts* (2001).