

Intra Industry Trade in Trinidad and Tobago: Evidence from Static and Dynamic Measures

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Abstract: This paper examines the nature of intra-industry trade (IIT) for Trinidad and Tobago (T&T) with Barbados, Jamaica, Guyana, St. Lucia, United States of America (USA), United Kingdom (UK) and Canada for the period 1991-2012. The paper employs the static (Grubel Lloyd index) and dynamic (Brulhart index) measures of IIT to assess the extent of two-way trade between T&T and selected intra-regional and extra-regional trading partners. The results of these indices indicate that there exist relatively low and decreasing levels of IIT for T&T in relation to their selected counterparts. The results can be attributable to the complementary nature of the selected CARICOM economies productive structure, their dwindling manufacturing base and T&T's competitiveness in a narrow range of products. The empirical findings of this paper help reinforce the notion that CARICOM countries can boost its intra-regional trade performance through deeper production integration.

Keywords: intra-industry trade, intra-CARICOM trade, static and dynamic measures of intra-industry trade.

JEL Classification: F14

1. Introduction

The pattern of trade among countries has traditionally been explained by the Heckscher Ohlin (HO) theory which asserts that countries will export those commodities that utilize their abundant factors intensively and import those commodities that intensively utilize its scarce resources. However, the notion that economies engage in two-way trade i.e. the simultaneous import and export of commodities within the same industries sparked considerable interest since the Second World War. The growth of IIT has stimulated both theoretical (Krugman 1979, 1980, 1981; 1980; Lancaster 1980; Dixit and Norman, 1980; Helpman 1981; Brander, 1981; Falvey, 1981; Falvey and Kierzkowski, 1985) and empirical (Balassa, 1966; Grubel and Lloyd, 1971; Helpman, 1987; Hummels and Levinsohn, 1995) research to explain its growing trend and is considered to be one of the major empirical discoveries of the 1960's and 70's.

Studies on the trade in similar products in CARICOM are sparse and for the most part focus on inter-industry type trade. Very few exceptions exist (see Lewis and Webster, 2001 and Lorde et al. 2008); these studies however employ a comparative advantage approach which focuses extensively on the export similarities among member states. The only study utilizing IIT indices to determine the extent of simultaneous trade of goods within the same industry in the region is the work of Lewis (2008). In this study, Lewis (2008) conducted an assessment of the extent of IIT in Jamaica with CARICOM during 1991-2005 using dynamic measures. Apart from this study by Lewis (2008), to the best of the authors' knowledge, there has been a general lack of empirical evidence on the level and extent of IIT in the CARICOM region and more so for T&T.

The regional group has engaged in several forms of regional integration arrangements over time which has brought about new trading patterns among members.¹ As such, a closer examination of the changes in intra-CARICOM and extra-CARICOM trade is warranted. This paper aims to fill the empirical gap which exists in the literature by conducting a thorough assessment of simultaneous trade of goods within an industry in T&T with major intra-regional and extra-regional trading partners. From this assessment the structure of change in trade flows during 1990-2012 will be established and evidence on whether trade has been predominantly inter-industry or intra-industry in nature will be provided.

The main contribution of this paper is therefore to employ a different methodological approach (from Lewis and Webster, 2001 and Lorde et al. 2008) to assess T&T's trade relations among CARICOM countries (1991-2012) which will partially address the gap currently existing in the literature by employing both static and dynamic IIT measures. Furthermore, the paper also confers several reasons for IIT as proffered by existing literature to support the empirical findings obtained from the aforementioned measures of IIT. Finally, the paper compares the level of IIT for T&T with Lewis (2008), as well as with the overall trend in IIT, as outlined in the international literature to identify trends and possible reasons for differences in the level of IIT for CARICOM countries in relation to the global trend in IIT.

In this regard, the rest of this paper proceeds as follows: the next section reviews the literature on IIT. The level and pattern of intra-CARICOM trade and competitiveness undergoes investigation in Section 2 followed by an outline of the static and dynamic measures of IIT utilized in the paper. Section 4 provides the empirical results from the bilateral Grubel Lloyd and Brulhart indices from which conclusions are drawn in Section 5. In addition, Section 5 also suggests some recommendations pertaining to production integration in the CARICOM region.

2. Literature Review

A prominent aspect of recent international trade is IIT. The concept of IIT received early recognition prior to the Second World War around the 1930's by Ohlin (1933), Hilgerdt (1936) and Haberler (1936) and again by Frankel (1943) towards the end of the war in 1945. An examination of the formation of economic integration arrangements among European countries during the 1960's on trade patterns; Verdoon (1960), Dreze (1961), Michaely (1962), Kojima (1964), Balassa (1966) and Grubel (1967) in independent studies found that inter-industry specialization did not emerge with free trade. Specifically, with the freeing of trade among European countries, a prominent aspect of their trade was simultaneous imports and exports of similar commodities.

Grubel and Lloyd (1971 and 1975) is known to have made the most prominent contribution to the IIT literature and elaborated on the empirical work of Balassa (1966). The work of Grubel and

¹ Regional integration in the region has evolved from the West Indian Federation – political integration which began in 1958 and lasted 5 yrs to CARIFTA – Caribbean Free Trade Association (1965) which encouraged free trade among members and then CARICOM– Caribbean Community and Common Market (1973). The CARICOM Single Market and Economy (CSME) were borne out of commitment to deeper regional integration and was implemented in 2006.

Lloyd (1971) and Gray (1973) provided further evidence to the work of Verdoon (1960) and Grubel (1967) on the existence of IIT within the European Economic Community (EEC).

The theoretical aspect of IIT which emphasizes the role and distinction of vertical and horizontal IIT emerged by the second half of the 70's into the 80's comprising the pioneering models by Krugman (1979, 1980, 1981), Lancaster (1980), Helpman (1981), Brander and Krugman (1983), Eaton and Kierzkowski (1984), Helpman and Krugman (1985), Caves (1981) and Shaked and Stutton (1984). Econometric modeling of the phenomenon is widespread. Helpman (1987) is usually endorsed as being the first to carry out econometric testing of the IIT theory followed by Hummels and Levinsohn (1995) who further elaborated the work of Helpman (1987). Numerous studies utilized econometric techniques to examine the empirical determinants of IIT for example; Greenaway and Milner (1986), Balassa and Bauwens (1987), Stone and Lee (1995), Leitão and Faustino (2008), Rasekhi (2008), Wang (2009), to name a few.

An extensive wealth of literature also exists on the reasons for IIT; these have been broadly classified into country specific factors and industry specific factors (Greenaway and Milner 1989). Industry-specific² factors include product differentiation, economies of scale, market structure, FDI flows i.e. the role of multinational corporations and technological expertise; while country-specific³ determinants include economic development, market size, geographic proximity, economic integration and barriers to trade (Greenaway and Milner 1989). The rest of this section examines the literature on the determinants of IIT.

Many of the initial studies on IIT concluded that a high degree of product differentiation is an important aspect of IIT (see Balassa, 1967, Grubel and Lloyd, 1975). It is similar products that vary either in terms of quality or with respect to their attributes are regularly exported or imported by the same country (Krugman 1979, 1980; Lancaster 1980; Burange and Chaddha 2008). Where there are similarities in demand between countries and consumers have a desire for varied products and services, product differentiation generates IIT between the relevant economies (Venables 1987; White, 2009 and Leitao, 2011). Greenaway et al. (1995), Fontagné et al. (1997), Hu and Ma (1999), and Aturupane et al. (1999) have all indicated empirically that FDI positively influences the level of product differentiation. Markusen (1995), Greenaway et al. (1994) and Fakau et al. (2003) observed empirically that high amounts of FDI were associated with higher levels of IIT. Technological expertise is another industry specific factor influencing IIT (Davis 1995). Research on technology intensive industries can trade in differentiated goods. IIT therefore arises in technologically sophisticated manufactured goods which require substantial amounts of research and development expenditure (Scherer and Huh 1990).

The level of economic development of a country also determines its potential for intra industry type trade with bilateral trading partners (Havrylyshyn and Civan, 1983). A higher degree of IIT is associated with countries at a higher stage of economic development. If two economies are identical in many regards, including income, factor endowments and demand structures, then their

² See: Balassa, 1986; Ballance *et al.*(1992); Globerman and Dean, (1990); Greenaway and Milner, (1986); Greenaway *et al.*, (1994); Havrylyshyn and Civan, (1983); Helpman, (1987); Loertscher and Wolter, (1980); Montout *et al.*, (2002); Reganati and Pittiglio, (2005); Stone and Lee, (1995).

³See: Aturupane *et al.*, (1999); Caves, (1981); Clark, (1993); Crespo and Fontonoura, (2004); Greenaway *et al.*, (1995); Hamilton and Kniest, (1991); Lundberg, (1982); Lundberg, (1992); Pagoulatos and Sorensen, (1975); Ray, 1991; Toh, (1982).

IIT will generally be very high. For example, Greenaway et al. (1994), Hummels and Levinshon (1995), Andresen (2003), Turkcan (2005), Shahbaz and Leitao (2011) all found that when the gaps in the level of economic development widened between bilateral trading partners the amount of simultaneous import and export of similar products decreased.

The geographical distance between two countries also influences the level of IIT between two bilateral trading partners. As the distance between two countries widens the potential for IIT erodes (Balassa and Bauwens, 1987). This geographic proximity factor takes into consideration three determinants of IIT; transportation costs, culture and tastes and resource base. Firstly, two geographically close countries will tend to have lower transportation costs and greater trade intensity, *ceteris paribus*. Secondly, two geographically close countries are more likely to have culture and taste resemblance which increases the potential for IIT and thirdly, geographically close countries are more likely to have parallel resource bases and therefore participate in the same industries.

Economic integration also influences the degree of IIT. A number of empirical studies in the literature have provided empirical evidence to support the existence of a connective link between regional integration and IIT (see Willmore 1974; Balassa 1979; Grubel and Lloyd 1975; Glejser et al. 1982; Pelzman 1978 and Drabek and Greenaway 1984).⁴ It is expected that an economic integration union will reduce intra-customs union barriers which prompt an increase in the volume of intra-union trade. For an economic integration arrangement to stimulate a greater degree of IIT than would occur with multilateral trade liberalization, a number of factors have to be present. One key factor is that if before the integration arrangement the economies were characterized by similar production and consumption patterns, then upon formation of a customs union the likelihood of IIT as compared to inter-industry trade is higher (Drabek and Greenaway, 1984). In addition, it is critical for the production structures between trading partners to be competitive rather than complementary to encourage intra-industry expansion. Finally, for IIT to be high, consumers within the customs union arrangement must have a high propensity to import from intra bloc member states when compared to extra bloc trading partners.

The following Section gives a brief overview on the trade performance and production structures of the CARICOM bloc during 1990-2012. From this synopsis of how the regions' trade has performed in the last decade; the production patterns, consumption patterns and competitiveness can be gauged which will aid in drawing conclusions based on the empirical results for IIT.

3. Intra CARICOM Trade Performance, 1990-2012

This section will briefly review some of the salient features CARICOM's intra regional trade. It takes a closer look at the intra regional and extra regional trade performance within the CARICOM sphere. Some discussion of the region's GDP and its structure over time and T&T's competitiveness is also undertaken.

Intra regional imports and to a lesser extent exports has been small, accounting for less than 10 per cent of total imports and between 10-15 per cent of exports, respectively (see Table 1).

⁴ Drabek and Greenaway (1984) and Greenaway and Milner (1984) provide a theoretical discussion on the relationship.

In particular, Barbados, Dominica and St. Vincent and the Grenadines rely heavily on the intra regional market for an average of at least 40 per cent of their total exports. Grenada, St. Lucia, T&T and somewhat Guyana also utilize the CARICOM bloc for a fairly large proportion of their gross exports, averaging at 27 per cent, 22 per cent, 18 per cent and 14 per cent, respectively during 1990-2012. The Bahamas, Belize, Jamaica, St. Kitts and Nevis and Suriname however, depends on the extra regional markets for most of their exports as less than 10 per cent are exported intra regionally (refer to Table 2).

Further investigation on the commodities exported in the region during 1990-2010 at the SITC 3 digit level of disaggregation is shown in Table 3. The region's export basket is dominated by the exports of primary based commodities (SITC 0, 1, 2, 3 and 4) of which 'mineral, fuels and lubricants' (SITC 3) lead; followed by manufactured products (SITC 6, 7, 8 and 9). Specifically, using 2010 as a reference year, in 2010, exports of primary commodities accounted for roughly 90 per cent of exports in the region of which approximately 70 per cent originated from the exports of 'mineral, fuels and lubricants'.

The dominance of exports of SITC 3 in the region is directly correlated with the rich endowment of hydrocarbons in the T&T economy. In particular, being a hydrocarbon based economy heavily endowed with crude oil and more so natural gas, T&T has overshadowed exports in the region in the past (refer to Table 4). Particularly, T&T's intra CARICOM exports as a proportion of total intra CARICOM exports have exploded from 49.6 per cent in 1990 to 71.9 per cent in 2012.

Despite evidence of a declining trend in extra regional imports proportionate to total regional imports from the world, regional imports from the world have increased considerably from approximately US\$5,000mn in 1975 to about US\$45,000mn in 2012 (see Figure 1). CARICOM countries have a high propensity to import from extra regional markets compared to the intra regional market.

This high propensity for imports is reflective in the merchandise trade balances for these countries (Table 5). Since 1990 T&T has been the only economy to record a continual merchandise trade surplus in the region, every other member state carried an intra-CARICOM merchandise trade deficit. In particular, observe that the balance of trade of those CARICOM countries from the OECS bloc has been persistently in deficit.⁵

A further look at how the GDP of these economies is derived based on productive activities in various sectors is shown in Table 6. The time periods examined are averages between 1990 and 1996 and between 2006 and 2012. For both time periods, the services sector appears to be the hallmark of economic activity in all countries except that of T&T. Nevertheless, the services sector still forms a considerable part of the T&T economy accounting for an average of 30 per cent between 2006 and 2012 down from 30 per cent between 1990 and 1996.

The distinguishing facet about T&T's structure of production is the relatively large size of the mining sector which includes hydrocarbons. On average, approximately half of the economy's

⁵ Of the mentioned countries, Dominica, Grenada, St. Kitts, St. Lucia and St. Vincent forms part of the OECS bloc.

GDP was derived from this sector from 2006 to 2012, up from 34 per cent since 1990 to 1996. In Barbados and St. Lucia the mining sector is more or less non-existent while in Guyana and Jamaica it has been on the decline due to the glum bauxite industry. GDP derived from the manufacturing sector has also declined in both five year intervals for all economies.

Manufacturing activity has been most prominent in Guyana, Barbados and Jamaica, forming 15 per cent, 11 per cent and 10 per cent, respectively in 1990-1996 declining to 7 per cent, 6 per cent and 7 per cent, respectively for 2006-2012. The construction sector also appears to be on the decline with no more than 9 per cent contributing to GDP (Guyana and St. Lucia between 2006 and 2012). The agricultural sector involvement in GDP generation is dismal for all except Guyana. Although this sector has contracted in Guyana it still accounted for an average 19 per cent of their GDP between 2006 and 2012. For Barbados and to a greater extent T&T the agricultural sector has the smallest contribution to productive activity in 2006-2012 (1.3 per cent and 0.5, respectively).

Export Competitiveness Assessment: The TradeCAN Approach:

An assessment of the competitiveness of the T&T economy with CARICOM was conducted using TradeCAN. TradeCAN is a software/database which utilizes SITC three and four digit data from United Nations Commercial Trade (UN COMTRADE) database to construct an export competitiveness matrix for a country.⁶ This competitiveness matrix produced by the TradeCAN software divides export sectors as either dynamic or stagnant. A dynamic sector is defined as one in which its share in world demand has increased over a period of time (i.e. from a base year to a final year) while a stagnant sector is seen as one which has experienced a fall in the share of world demand from the (i.e. from a base year to a final year). These two classifications are then used to categorize export commodities as “rising stars”, “declining stars”, “retreats” and “missed opportunities”. For the purpose of this paper, the variable used to classify export competitiveness of the T&T economy with CARICOM is the percentage of exports. Table 7 outlines the matrix classifications and the satisfactory conditions for the Trade Competitiveness Matrix in TradeCAN.

Table 8 below shows the competitive matrix between T&T and CARICOM. The results of the matrix reproduced from TradeCAN are in SITC 4 digit level of disaggregation.⁷ From the Table, 66.24 per cent of T&T’s exports belonged to the rising star category in 2010. This category was dominated by petroleum gases (3413) accounting for 22.33 per cent of exports in 2010 followed by non-alcoholic beverages (1110) with 14.97 per cent of exports in the same year. Retreats, missed opportunities and declining stars each accounted for 2.62 per cent, 0.81 per cent and 9.49 per cent of exports, respectively. The retreats category consisted of three product groups lead by Portland cement (6612) and builders carpentry (6353) accounting for 1.13 per cent and 0.97 per cent of exports, respectively. The T&T economy suffered missed opportunities in only one product group bars and rods (6732) while the declining stars category had eight product groups headed by bakery products and edible products and preparations accounting for 2.53 and 2.26 percent of T&T’s exports in 2010.

⁶ Refer to TradeCAN User Guide (2009) by the Economic Commission for the Latin America and the Caribbean (UNECLAC) for details on the competitiveness matrix which divides export sectors into dynamic and stagnant sectors.

⁷ A dynamic sector is defined as one in which its share in world demand has increased over a period of time (i.e. from a base year to a final year) while a stagnant sector is seen as one which has experienced a fall in the share of world demand from the (i.e. from a base year to a final year).

The indication from this generalized overview is that the structure of production amongst CARICOM economies appears to be complementary rather than competitive. The competitiveness analysis done using TradeCAN displays a significant proportion of T&T's exports to CARICOM as 'rising stars'. Despite the results indicate that competitiveness of T&T exports to CARICOM has been improving in most of the exports in the rising stars category are concentrated in two product groups, petroleum gasses and non-alcoholic beverage. This pattern gives an indication that T&T's exports with CARICOM are highly influenced by the strong comparative advantage in petroleum gasses and hydrocarbons. In addition, consumption patterns in the region lean to a high propensity to imports from extra regional sources. A priori, one would therefore expect that CARICOM and more so T&T's intra-regional trading patterns would be more of the H/O than intra industry type.

4. Methodology and Data - Measuring Trade Overlap⁸

The Grubel Lloyd index (GLI) is perhaps the most widely used and most appropriate for documenting an industry's trade pattern in a single period of time, i.e. for measuring IIT in a static sense.⁹ The GLI however fails to account for any change in trade from one period to the next. In addition, the GLI is limited due to the categorical aggregation problem whereby sub-group aggregation tends to inflate the GLI towards 1 leading to a misrepresentation of the extent of IIT.¹⁰

The inability of the GLI to capture the dynamic changes in IIT has prompted Brulhart (1994) to put forward indices to measure marginal IIT (MIIT).¹¹ The Brulhart A-index of MIIT is capable of identifying dynamic changes in trade flows. The strength of this A-index is that it indicates changes in the structure of the change in trade flows and is defined in all cases and carries all of the statistical attributes of the GLI (Brulhart 1994).¹²

Based on the preceding discussion of the various measurements of static and dynamic IIT, this paper will employ the GL and the Brulhart A-index to estimate static and dynamic IIT for T&T in relation to selected trading partners.¹³ The data utilized in calculating these indices were obtained from the UN COMTRADE database and the Central Statistical Office of T&T. The level of aggregation used to perform calculations was done at the Standard International Trade Classification (SITC) 3-digit level.¹⁴

5. T&T's IIT with selected CARICOM and non-CARICOM countries

⁸ Refer to Appendix 1

⁹ The first index of IIT was proposed by Balassa (1966) which measured the extent of simultaneous imports and exports of goods within an industry. This index is basically a ratio of net trade (exports less imports) to gross trade (exports plus imports).

¹⁰ Inappropriate classification of products in the same industry may not give a clear judgment on the extent of IIT. Greenaway and Milner (1983) recognized that the GLI fails to identify the direction of trade since the weighting effect is lost when the net trade to gross trade ratio for the sub-groups is characterized by contradicting trade imbalances.

¹¹ These indices were the A-index, B-index and C-index

¹² For the statistical description of the GLI, see Greenaway and Milner (1995).

¹³ These measures were also used by several studies (see Sharma 2004; Andresen 2003; Luka and Levkovych 2004; Brulhart 2008; Yoshida et al. 2008; Gebreselasie and Jordaan 2009; Shahbaz and Leitao 2010).

¹⁴ Data provided from the Centra Statistical Office of T&T for the year 2012 was provisional and is subjected to change.

Four CARICOM countries – Barbados, Jamaica, Saint Lucia and Guyana - were chosen as a representation of CARICOM for comparison with T&T based on their GDP per capita differences (see Table 6) and availability of data. Based on their respective GDP per capita, those economies with a higher GDP per capita e.g. Barbados are assumed to be on a higher level of economic development than those with a lower GDP per capita e.g. Guyana. This assumption is fundamental in the analysis of T&T's IIT with selected intra CARICOM and extra CARICOM counterparts and surrounds the theoretical underpinnings of international trade put forward by Linder (1961). The Linder (1961) hypothesis places emphasis on the demand side in determining the direction of trade. The theory argues that analogous demand structures determine the incidence of manufacturing trade patterns. Linder (1961) contends that the higher a country's per capita income the more diversified its pattern of demand is expected to be and as such, two countries with similar demand structures will produce a similar range of commodities (Linder, 1961).¹⁵ This Section now proceeds to formally assess the nature and extent of IIT between the T&T economy relative to Barbados, Jamaica, Guyana, St. Lucia, USA, UK and Canada.

A. T&T's Static IIT with selected Intra CARICOM Trade Partners

Comparisons are made between the level of IIT and T&T's GDP per capita in relation to the respective countries from which conclusions are drawn. Figures 2 to 5 show the trend in the relative income per capita for T&T in relation to Barbados, Guyana, Jamaica and St. Lucia, respectively and their bilateral GLI values for the period 1991 to 2012.

The indication from Figure 2 is that until 2005 T&T's GDP per capita was less than that of Barbados which subsequently increased to approximately 1.08 times that of Barbados (refer to Table 8). During the same time period, the GLI values experienced a sharp decline from 0.30 in 1991 to a very low 0.04 in 2009. After 2009 there was an increase in the index in 2010 followed by a decline in 2011 and a subsequent increase in 2012 to 0.07 from 0.04. This result is not entirely surprising as one would expect that with growing differential income, according to good practice theory, would lead to a decline in IIT, *ceteris paribus*.

In Figure 3, although the relative size of T&T's GDP per capita was initially 8 times that of Guyana, by 1998 it contracted to 6 times. However, after 1998 T&T's GDP per capita as a proportion of Guyana's increased significantly to 10 times (by 2006) which then marginally declined to the initial level of 8 times by 2012. With respect to their bilateral GLI value, it started off at the lowest level compared to the other CARICOM counterparts examined at 0.05 in 1991. The index value initially increased until 1995 subsequent to which a consistent decline was observed such that by 2010 the GLI stood at 0.02. A marginal increase to 0.05 was recorded in 2012. Compared to Figure 4 which illustrates T&T's bilateral GLI with Barbados and their relative GDP per capita the GLI value with Guyana is significantly lower. This low index value can be as a result of the wide variations in per capita income between T&T and Guyana. The widening variation in relative per capita income clearly indicates that both economies are on different levels of economic development and as such, according to the determinants examined in Section 1, low

¹⁵ Although many earlier empirical studies did not find supporting evidence of this hypothesis (Kennedy and McHugh (1980) and Qureshi et al. (1980) and Hoftyzer (1984)) the Linder hypothesis received strong empirical support by Ellis (1983), Balassa (1986), Culem and Lundberg (1986), Balassa (1987), Chow et al. (1999), McPherson et al. (2001), Choi (2001) to name a few.

intra industry ratios are highly probable. Overall, for the time period 1991 to 2012 T&T's bilateral trade with Guyana was not of an intra-industry nature.

In the case of Jamaica (see Figure 4), T&T's GDP per capita was always greater being 1.5 times more in 1991 and grew to almost 3 times more by 2012 (2.72 times). For the same time interval, the extent of IIT for these intra regional bilateral trading partners, however, was substantively eroded. Although having the second highest initial GLI value (recall Barbados had the highest in 1991), Jamaica's Grubel Lloyd score for bilateral trade between the two economies was 0.01 in 2010 as compared to 0.26 in 1991. By 2012 the T&T bilateral trade with Jamaica recorded a negligible increase to 0.03. The T&T economy had the lowest level of IIT with Jamaica opposed to other CARICOM counterparts from 2010-2012.

Despite being considerably smaller than the other selected CARICOM counterparts, T&T's per capita income was 1.2 times that of St. Lucia which persistently grew to almost 2 times by 2010, although declining marginally in 2011 and 2012, T&T's relative income with St. Lucia remained at approximately twice its size.¹⁶ In terms of the level of IIT between T&T and St. Lucia, it fluctuated at very low levels between 1991 and 2012 reaching a low of 0.04 in 2010 and then increased minimally in 2011 and 2012 to 0.05 and 0.06, respectively when compared to 0.10 in 1991 (refer to Figure 5).

From the Figures (2 to 5) it can be concluded that overall there is a very low and in most decreasing amount of Grubel Lloyd type of IIT between the T&T economy and its various intra CARICOM bilateral trading partners. The GLI although highest in the case of bilateral trade with Barbados, it is still very low and dwindling. For all countries there was an increase in the index between 2010 and 2012 however this increase was negligible. The information from Figures 2 to 5 is reproduced in Table 9 for convenience.

B. T&T's Static IIT with selected extra CARICOM countries

Turning attention to the extra regional trading countries, the extent of bilateral trade between T&T and the USA, UK and Canada is now examined.

Table 10 illustrates the trend in the relative GDP per capita of the T&T economy with the selected extra CARICOM countries and their GLI values for the period 1991 to 2012. From Table 10 it can be deduced that T&T's per capita income relative to the USA, UK and Canada between 1991 and 2012 has been declining. On average T&T's GDP per capita accounted for only 20 per cent, 28 per cent and 30 per cent, respectively of its listed extra CARICOM trading counterparts' income per person. Upon examination of the GLI scores, the level of IIT between T&T and these extra CARICOM trading partners appears to be generally low and declining for the period concerned with the exception of Canada in 2012 who recorded an increase from 0.02 in 2011 to 0.06 in 2012. As of 2010, less than 5 per cent of the trade between T&T and the USA, UK and Canada is of an IIT type with 4.8 per cent, 3.3 per cent and 1.2 per cent, respectively accounting for simultaneous imports and exports down from a low 7.9 per cent, 4.3 per cent and 4.5 per cent, respectively in 1991. By 2012 IIT between T&T and the USA were purely inter industry (0.0 per cent of trade

¹⁶ Being one of the smaller members of CARICOM, the St. Lucian economy comprised of 176,000 persons and had a GDP of US\$966.7mn as of 2011 (World Development Indicators Databank, 2012).

were IIT), however simultaneous trade between T&T and UK and Canada rose to 8 per cent and 6 per cent, respectively.

C. T&T's Marginal IIT with selected CARICOM and extra CARICOM countries

Marginal IIT between T&T and all selected countries are now examined for the period 1992 to 2012 to capture the dynamic nature of intra industry trading patterns.

In Table 11, the MIIT index (Brulhart's A-index) for T&T with Barbados, Guyana, Jamaica, St. Lucia, the USA, the UK and Canada is presented. From the results, it is observed that bilateral MIIT for T&T with the intra regional trade partners have declined persistently until 2009 subsequent to which negligible increases were recorded until 2011 and declined by 2012 once more. T&T's MIIT with the extra regional counterparts saw marginal increases until 2010 which deteriorated by 2012 except in the case of UK who recorded, although still very low, an increase in the index value from 0.02 in 2011 to 0.07 in 2012.

Overall, the A-index values were generally low (close to zero) confirming that most changes occurring in trade flows with the listed bilateral trading partners for 1992 to 2012 originated from inter industry type trade. This declining trend in IIT indicates that the bilateral exports and imports for these countries at the SITC 3 digit level of aggregation, generally demonstrates diverging trends.

In general, the low, and in most cases, decreasing amount of IIT (marginal or otherwise) between the T&T economy and various bilateral trading partners is consistent with the reasons proffered for IIT in the literature. With respect to the country specific factors, economies at a similar level of economic development are geographically close to each other and fall under an economic integration arrangement tend to have greater chances of trade being of an intra industry type. However, the countries investigated in this paper had some variations in their level of economic development on per capita incomes basis, especially Guyana and Jamaica and to a lesser extent St. Lucia compared to T&T. Barbados was the only bilateral trading partner that can be deemed at a similar level of economic development with T&T based on GDP per capita (T&T's per capita income relative to Barbados was 1.08 times as of 2012). As such, although still low and declining, the highest index values for static IIT were observed with Barbados. Guyana and Jamaica had wider variations in their per capita income with T&T and had much lower GLI value.

In addition, although CARICOM member states are geographically close and all form part of the regional integration arrangement (CARICOM) which eliminates many artificial barriers that may have prevented the prevalence of IIT, this type of trade still occurred to be low and decreasing. In order for economic integration to have an influence on IIT, the affiliated economies must have similar production and consumption patterns together with a high propensity to import from intra bloc members. Clearly from our investigation of intra CARICOM trade in Section 2 member states do not satisfy these requirements as their production structures are more complementary (see Table 6) rather than competitive (see Table 8) and are heavily reliant on the extra regional market for their consumption (see Figure 1). These factors can without a doubt be responsible for the almost non-existent simultaneous trade in goods between T&T and the selected bilateral partners.

T&T's low and decreasing manufacturing base can also account for the relatively low levels of IIT with CARICOM countries in comparison to the general findings in the international literature. Specifically, T&T, Guyana and Jamaica have a relatively large (as a percentage of GDP) manufacturing sector in comparison to the region, however, this sector still very small in the sense that it only accounts for approximately 7 per cent of their GDP (see Table 6). In the selected economies, the dwindling manufacturing sector coupled with low income per capita (except T&T), complementary production structures and a high propensity for imports from outside the regional market would no doubt hinder prospects in IIT expansion. Competitiveness in only a narrow range of commodities in T&T with CARICOM countries can also be accountable for the low levels of IIT for T&T.

The empirical estimates on IIT for T&T produced in the paper are also similar to those obtained by Lewis (2008) in his examination of marginal IIT in Jamaica with CARICOM. The empirical results obtained in this paper indicate that the increase in trade among CARICOM countries is predominantly inter-industry in nature since the presence of IIT is negligible.

6. Conclusion

This paper examined the level of IIT for T&T with selected CARICOM countries and selected extra CARICOM countries. The aim of this study was to establish whether the pattern of T&T's intra regional trade is characterized by high levels of IIT as opposed to inter-industry trade. The results suggest that there exist low and decreasing levels of IIT in T&T with the bilateral trading partners examined (Barbados, Guyana, Jamaica, St. Lucia, USA, UK and Canada). These results implied that the increase in intra-CARICOM trade especially from T&T (see Table 4) were predominantly of an inter-industry nature.

Based on the country-specific determinants of IIT examined in Section 1 some CARICOM countries e.g. Barbados and T&T are at a relatively similar level of economic development (on a per capita income basis), they are geographically close and they are all members of an economic integration arrangement which reduces trade barriers significantly however the results suggests low and deteriorating GLI and Brulhart index values. These results, just as Lewis (2008) discovered for Jamaica, are predominantly as a result of the complementary productive structure of these economies (see Table 6). In addition, a buoyant manufacturing sector and a high propensity to import intra regionally increase the prevalence of IIT which is lacking and severely decreasing within CARICOM countries (see Section 2, particularly Figure 1, Table 6 and Table 8).

As CARICOM progresses to the CSME, since intra industry type trade does not appear to be readily forthcoming and given the geographic closeness of member states it can be argued that CARICOM can benefit more from a regional production arrangement. In this regard, market expansion alone will not be sufficient and necessarily effective in expanding intra regional trade in a significant way. As such, policy driven production integration may certainly have a greater impact in terms of boosting trade in the region. This notion is consistent with the argument made by Farrell (2001) who noted that resource-production integration in the region is the only approach to regional integration that is feasible.

Production integration is understood to be "...the organization of integrated regional industrial complexes from raw materials to finished products" (Girvan 2006, p. 1). Furthermore, it is essential for the development of the region's economies as well as their success in the extra-CARICOM market (Girvan, 2006). According to Girvan (2006), the degree to which production integration exists can be investigated from the inter industry relations that exists within the region. It is evident from the trade statistics that production integration is "...relatively limited, and is growing only in the specific area of supply of energy based products from T&T and its CARICOM partners" (Girvan 2006, 2). As he continued, Girvan (2006) indicated that the phenomenal growth of the services sector (see Table 6) and the widening disparities of member states are cause for concern in considering a production integration arrangement for the region.

This paper therefore reinforces the argument for production integration in the region by arguing that with the CSME due to become fully functional in 2015, the message that should be sent, given the limited scope for IIT (both at the static and dynamic levels) is that the emphasis needs to be placed on deeper economic integration at the production stage. Moreover, for the CSME to facilitate production integration of goods, services and capital with the world economy and in order to ensure increased competitiveness while enhancing production integration, CARICOM heads must be proactive in addressing the many challenges the region is likely to face in the global marketplace.

It is important to note that given CARICOM's extra-regional trade agenda, in particular, the formation of Free Trade Areas (FTAs) with the European Union (EU) and the proposed CARICOM-Canada FTA, the region can experience considerable declines in domestic production capabilities especially from increased import substitution from the EU and Canada (see Greenaway and Milner 2004; Hosein and Khadan 2011). Given these likely potential outcomes in the near future, policymakers in the region should begin to actively identify potential feasible industries that can be successful in utilizing the joint resources of various member states. This in itself can lead to greater levels of intra-regional trade and assist in mitigating some of the potential import substitution effects associated with the signing the free trade agreements with the EU and Canada.

In this regard, this paper recommends that further research be conducted to investigate the extent of simultaneous trade between other CARICOM member states and selected intra CARICOM and extra CARICOM partners. In addition, since this paper looked at IIT for trade in merchandise goods, further research is warranted for simultaneous trade in services given the high concentration of the services sector in CARICOM countries. However, data necessary for calculation of GLI and Brulhart Index in the services sector will serve as a shortcoming in taking this exercise forward. Finally, potential research in the field can focus on IIT between CARICOM member states and second trading partners.

Endnotes

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Appendix 1

1. Balassa Index (1966):

$$B_j = \frac{|X_i - M_i|}{(X_i + M_i)}$$

Where; X_i – exports of commodity i,
 M_i – imports of commodity i.

Range from 0 to 1; with 0 representing pure IIT i.e. two-way trade and 1 representing pure inter-industry trade

2. Grubel Lloyd Index (1975):

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

Where; GL - value of the index

X_i - exports of commodity i for a given country in a given period

M_i - imports of commodity i for a given country in a given period

Theoretically, the range of this index resides between 0 and 1, the closer the value to unity, the higher the rate of IIT in that industry.

3. Brulhart A-index (1994):

$$MIIT_i = A_i = 1 - \frac{|(X_t - X_{t-n}) - (M_t - M_{t-n})|}{|X_t - X_{t-n}| + |M_t - M_{t-n}|} = 1 - \frac{|\Delta X - \Delta M|}{|\Delta X| + |\Delta M|}$$

Where: X_t and M_t refers to the exports and imports of industry i in year t,

X_{t-n} and M_{t-n} refers to the exports and imports of industry i in year t-n, where $n \geq 1$,

$\Delta X = X_t - X_{t-n}$ refers to the change in exports between the two years,

$\Delta M = M_t - M_{t-n}$ refers to the change in imports between the two years.

The Brulhart A-index ranges from between 0 and 1; where values tending towards zero indicate that changes in trade originate from inter industry type trade while values tending towards unity reveal that changes in trade flows are predominately intra-industry in nature.

Appendix 2

Table 1: Intra CARICOM Exports and Imports as a per cent of Total CARICOM Exports and Imports, 1990-2012		
Year	Intra CARICOM Exports as a per cent of Total CARICOM Exports	Intra-CARICOM Imports as a per cent of Total CARICOM Imports
1990	8.3	5.8
1991	8.4	5.6
1992	7.9	5.8
1993	8.2	6.9
1994	10.8	7.4
1995	12.1	7.7
1996	13.1	7.2
1997	14.5	8.2
1998	17.5	7.7
1999	17.0	8.5
2000	15.3	8.5
2001	17.6	8.7
2002	15.6	6.9
2003	13.0	8.6
2004	12.7	9.0
2005	12.8	8.7
2006	11.9	8.1
2007	13.6	9.0
2008	13.5	8.5
2009	14.2	7.8
2010	15.1	8.7
2011	13.3	8.3
2012	14.0	9.1
Average	13.1	7.9

Source: International Monetary Fund, Direction of Trade Statistics (2013) and own derivations.

Table 2: Intra CARICOM exports as a percentage of Total CARICOM exports

	Bahamas, The	Barbados	Belize	Dominica	Grenada	Guyana	Jamaica	St. Kitts & Nevis	St. Lucia	St. Vincent & the Grenadine	Suriname	Trinidad & Tobago
1975	0.2	11.8	2.7	n.a.	3.7	13.6	4.2	n.a.	n.a.	n.a.	0.9	9.9
1980	0.0	16.7	n.a.	61.1	10.8	13.9	6.2	n.a.	n.a.	43.0	0.5	10.5
1985	0.4	18.3	3.8	37.9	35.8	9.5	8.8	3.5	8.2	8.5	0.8	10.8
1990	0.0	24.0	6.5	24.9	28.1	8.8	6.6	3.4	8.4	33.9	1.3	11.3
1991	0.0	33.1	6.7	24.7	18.6	5.9	5.6	4.0	10.3	36.9	2.4	10.6
1992	0.0	36.1	5.4	27.8	8.7	6.1	4.7	1.9	12.4	40.7	4.1	11.3
1993	0.7	45.6	3.9	27.9	30.1	6.2	3.7	1.0	17.2	45.5	1.3	16.5
1994	0.5	43.2	3.5	36.0	25.2	6.1	3.6	3.1	14.5	54.3	1.9	17.6
1995	0.3	38.6	3.4	41.0	29.1	7.1	3.3	5.0	14.9	61.4	2.4	19.1
1996	0.1	36.4	2.8	45.1	28.0	5.3	3.0	2.2	13.2	47.0	3.4	24.5
1997	0.5	35.9	4.2	50.9	34.4	6.8	3.0	0.7	15.6	57.2	4.0	25.6
1998	0.5	44.1	6.9	58.6	24.7	9.0	3.5	1.7	19.2	48.8	4.3	30.3
1999	0.3	45.4	5.9	56.6	15.4	10.2	3.6	2.9	21.8	51.4	10.9	26.7
2000	0.5	26.3	4.9	56.4	15.2	10.9	3.9	7.7	25.1	45.7	8.6	23.8
2001	2.4	42.9	8.1	59.7	13.6	12.2	4.4	3.1	17.7	51.9	9.6	24.0
2002	0.3	44.4	6.0	41.3	20.6	13.0	4.6	2.6	23.1	51.4	24.4	21.3
2003	0.6	53.4	5.6	45.5	25.5	13.7	4.4	2.9	27.0	52.9	22.0	15.2
2004	0.4	52.2	6.6	46.7	32.1	14.8	3.8	4.0	26.8	57.6	11.3	14.5
2005	0.3	55.5	7.6	44.4	30.5	16.9	3.4	3.9	15.0	61.7	16.6	14.7
2006	0.4	48.3	6.5	50.7	38.3	17.0	2.8	5.3	9.8	12.8	16.8	13.4
2007	0.4	55.1	4.9	47.3	31.3	17.1	2.6	6.0	26.8	18.6	12.8	15.3
2008	0.4	57.9	4.7	30.1	35.8	16.7	2.8	6.6	33.5	12.9	20.0	14.9
2009	0.5	56.9	5.6	31.6	32.5	15.6	5.3	5.3	20.9	14.9	11.2	16.1
2010	0.7	50.2	7.8	42.2	39.3	16.7	7.8	6.1	37.8	31.9	16.0	16.1
2011	0.7	57.7	7.3	36.5	38.6	14.9	6.2	7.2	55.1	54.0	10.3	13.8
2012	0.7	63.6	7.0	37.1	34.7	13.6	7.6	7.4	50.0	66.9	13.0	14.5
Average 1990-2012	0.5	45.5	5.7	41.9	27.4	11.5	4.4	4.1	22.4	43.9	9.9	17.9

Source: International Monetary Fund, Direction of Trade Statistics (2013)

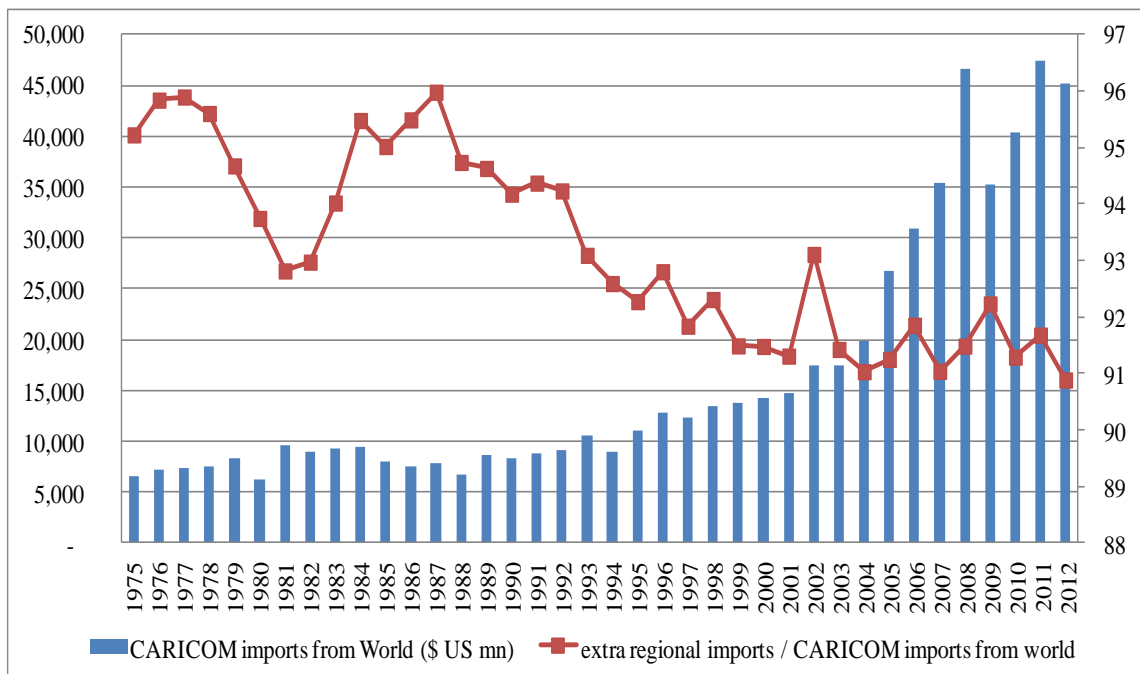
Table 3: CARICOM Intra-regional Exports as a share of intra regional exports by SITC sections										
	SITC 0 ^a	SITC 1 ^b	SITC 2 ^c	SITC 3 ^d	SITC 4 ^e	SITC 5 ^f	SITC 6 ^g	SITC 7 ^h	SITC 8 ⁱ	SITC 9 ^j
1990	1.1	12.1	57.5	23.3	-	-	3.2	-	19.9	6.2
1991	12.9	6.6	0.4	36.3	1.6	11.8	20.5	3.4	6.6	0.0
1992	16.0	6.4	0.6	30.0	0.9	14.2	20.9	3.3	7.7	0.0
1993	18.3	6.5	0.9	28.4	0.8	14.6	19.7	3.5	7.4	0.1
1994	17.6	6.4	0.7	31.0	1.0	14.1	19.9	3.0	6.5	0.0
1995	17.3	6.7	0.4	36.0	0.8	12.7	17.8	2.6	5.8	0.0
1996	16.4	6.1	0.4	38.3	0.8	12.9	17.1	2.0	6.0	0.0
1997	21.2	5.9	0.5	35.0	1.0	12.2	16.2	1.9	6.0	0.0
1998	20.8	7.2	0.7	33.6	1.1	9.5	18.2	2.5	6.3	0.0
1999	18.7	6.7	1.0	37.7	0.6	10.2	17.5	1.8	5.7	0.1
2000	15.5	6.2	1.0	49.3	0.4	8.4	12.4	1.9	4.9	0.1
2001	16.8	6.8	1.0	45.8	0.4	8.1	12.5	3.2	4.7	0.6
2002	20.0	8.0	1.1	37.3	0.6	9.0	15.6	2.3	5.3	0.8
2003	16.8	5.9	0.9	51.1	0.5	7.2	10.8	1.2	5.2	0.2
2004	20.7	6.9	1.4	39.5	0.8	8.7	14.8	1.8	5.1	0.3
2005	11.1	4.5	0.8	65.1	0.4	4.9	8.2	1.6	3.2	0.2
2006	10.4	4.3	0.8	67.5	0.2	4.4	7.6	1.8	2.8	0.1
2007	13.9	5.7	1.0	55.3	0.3	6.3	10.5	2.0	5.0	0.1
2008	9.6	3.8	0.8	71.8	0.2	3.8	6.5	1.2	2.2	0.1
2009	16.6	6.4	1.1	52.5	0.4	5.8	10.1	0.9	3.5	2.7
2010	11.6	3.9	0.7	70.5	0.2	4.3	5.3	0.8	2.4	0.3
Average 1990-2010	15.4	6.3	3.5	44.5	0.7	9.2	13.6	2.1	5.8	0.6
^a Food & Live Animals ^b Beverages & Tobacco ^c Crude Materials & inedible (except fuels) ^d Mineral fuels, lubricants and related materials ^e Animal and vegetable oils, fats and waxes ^f Chemicals and related products, n.e.s. ^g Manufactured goods classified chiefly by material ^h Machinery and transport equipment ⁱ Miscellaneous manufactured articles ^j Others										

Source: United Nations Commercial Trade Database, (2013)

Table 4: T&T Intra CARICOM Exports as a per cent of Total Intra CARICOM Exports			
	Trinidad & Tobago exports to CARICOM (\$US mn)	Intra CARICOM Exports (\$US mn)	T&T Intra CARICOM Exports as a share of Total Intra CARICOM Exports
1990	225.1	453.3	49.6
1991	210.8	443.2	47.6
1992	209.6	448.4	46.7
1993	269.4	512.7	52.5
1994	426.1	666.6	63.9
1995	583.5	875.3	66.7
1996	613.5	907.8	67.6
1997	651.6	973.9	66.9
1998	686.9	1025.5	67.0
1999	748.9	1141.0	65.6
2000	722.5	1073.6	67.3
2001	1030.4	1406.1	73.3
2002	821.0	1194.8	68.7
2003	1001.9	1400.6	71.5
2004	1227.8	1669.5	73.5
2005	1672.9	2190.6	76.4
2006	1780.9	2360.3	75.5
2007	2284.5	2976.8	76.7
2008	2860.3	3711.7	77.1
2009	1920.8	2589.3	74.2
2010	2323.1	3230.8	71.9
2011	2601.9	3618.5	71.9
2012	2712.6	3772.5	71.9
Average 1990-2012	1199.4	1680.1	67.1

Source: International Monetary Fund, Direction of Trade Statistics (2013)

Figure 1: Extra Regional Imports and Extra Regional Imports as a per cent of Total CARICOM Imports



Source: *Direction of Trade Statistics, International Monetary Fund (2013)*

Table 5: Intra CARICOM countries Trade Balance (1975, 1980 and 1990-2012)

	Bahamas	Barbados	Belize	Dominica	Grenada	Guyana	Jamaica	St. Kitts	St. Lucia	St. Vincent	Suriname	T&T
1975	(8.1)	(20.9)	(1.2)	(10.3)	(7.4)	(22.0)	(62.2)	(6.5)	(9.1)	(14.9)	(43.3)	136.2
1980	0.7	35.9	-	5.9	1.9	53.8	59.9	-	-	6.6	2.2	409.4
1990	(4.5)	(53.0)	(4.5)	(11.4)	(19.7)	(16.7)	(14.8)	(5.6)	(4.8)	(0.2)	(43.9)	154.2
1991	(16.4)	(33.7)	0.5	(13.0)	(22.4)	(22.3)	(1.8)	(7.1)	(13.0)	(8.3)	(53.2)	138.3
1992	(7.5)	(40.2)	(4.8)	(10.4)	(29.2)	(32.3)	9.9	(7.9)	(42.6)	(2.0)	(55.0)	141.1
1993	2.8	(48.0)	(5.8)	(9.3)	(34.4)	(47.7)	(47.9)	(8.4)	(38.1)	(6.1)	(187.6)	218.9
1994	(3.5)	(52.2)	(6.2)	(10.9)	(27.9)	(48.6)	(103.7)	(23.9)	(43.1)	(6.7)	(39.3)	372.6
1995	(5.7)	(28.5)	(7.3)	(12.4)	(28.7)	(71.2)	(208.5)	(28.3)	(44.6)	(9.1)	(39.9)	508.6
1996	(7.7)	(21.9)	(6.0)	(8.2)	(35.1)	(80.3)	(228.4)	(30.4)	(57.9)	(13.4)	(60.3)	531.3
1997	(2.0)	(22.0)	(3.5)	(7.1)	(37.9)	(100.5)	(230.2)	(33.8)	(61.4)	(18.1)	(65.2)	555.2
1998	(5.3)	(51.2)	0.7	3.6	(46.7)	(59.4)	(265.6)	(32.8)	(59.9)	(23.0)	(46.4)	580.6
1999	(13.7)	(78)	(3.3)	(3.5)	(45.5)	(44.1)	(324.2)	(27.0)	(64.5)	(21.6)	(18.6)	617.3
2000	(24.3)	(158)	(5.1)	(9.2)	(48.6)	(34.8)	(354.1)	(34.1)	(64.5)	(25.9)	(19.8)	633.4
2001	(7.0)	(107.2)	4.2	(10.5)	(55.4)	(55.6)	(380.4)	(40.6)	(81.7)	(29.5)	(24.2)	909.8
2002	(27.6)	(124.5)	(7.1)	(7.1)	(53.6)	(46.9)	(345.2)	(35.6)	(65.3)	(30.5)	6.7	729.1
2003	(28.9)	(177.6)	(4.2)	(16.3)	(66.9)	(65.6)	(435.3)	(42.5)	(83.8)	(36.5)	(10.8)	873.4
2004	(43.6)	(240.6)	12.4	(18.1)	(86.3)	(92.4)	(528.9)	(54.0)	(102.9)	(43.6)	(21.1)	1,112.8
2005	(48.3)	(259.8)	(5.3)	(21.4)	(102.4)	(98.4)	(861.4)	(62.6)	(124.1)	(48.5)	(18.7)	1,508.4
2006	(59.3)	(272.5)	(10.9)	(24.4)	(119.8)	(142.3)	(804.7)	(74.7)	(148.9)	(65.7)	(17.3)	1,588.1
2007	(74.3)	(297.0)	(20.9)	(31.7)	(148.4)	(175.0)	(1,134.4)	(92.5)	(183.5)	(81.7)	(21.3)	2,071.8
2008	(85.4)	(347.5)	(25.2)	(39.8)	(169.7)	(216.9)	(1,567.7)	(105.7)	(209.9)	(93.1)	18.7	2,591.3
2009	(74.5)	(330.9)	(20.8)	(33.8)	(149.5)	(178.3)	(670.3)	(95.5)	(186.1)	(82.2)	(50.2)	1,721.4
2010	(90.6)	(455.3)	(22.5)	(41.5)	(188.9)	(253.4)	(837.6)	(121.1)	(235.9)	(104.6)	(18.8)	2,082.4
2011	(101.5)	(509.9)	(25.2)	(46.5)	(211.5)	(283.8)	(938.1)	(135.6)	(264.2)	(117.2)	(21.1)	2,332.2
2012	(105.8)	(531.6)	(26.3)	(48.4)	(220.5)	(295.9)	(978.1)	(141.4)	(275.4)	(122.1)	(22.0)	2,431.5
Average 1990-2012	-36.3	-184.4	-8.6	-18.8	-84.7	-107.1	-489.2	-54.0	-106.8	-43.0	-36.1	1061.0

Source: International Monetary Fund, Direction of Trade Statistics (2013)

Table 6 : Productive Structure of various CARICOM Economies (1990-1996 and 2006-2012)					
	Agriculture ^a	Mining ^b	Manufacturing	Construction	Services ^c
Barbados	2.1	0.3	11.4	3.4	68.2
	1.3	0.3	6	4.6	63.8
Guyana	21.1	13.6	15.2	6.2	40.3
	19.2	9.1	7.2	8.7	47.3
Jamaica	7.6	3.1	10.7	8.0	59.8
	5.9	2.4	7.3	6.6	69.5
St. Lucia	9.8	0.2	5.4	10.7	60.1
	3.0	1.0	4.3	8.7	71.0
T&T	1.5	34.3	6.0	6.6	30.2
	0.5	48.5	6.1	6.2	31.2

Source: UNECLAC (2013)

^a Includes hunting, forestry and fishing

^b Quarrying and Hydrocarbons

^c Includes electricity, gas and water; wholesale and retail trade; transport and communication; finance; communal, personal and social services; and general government.

Table 7: Technical details for TradeCAN Trade Competitiveness Matrix	
Matrix Classifications	Ratios
Rising stars: A rising star refers to an export commodity that gained export share in a dynamic commodity market, that is, where the share of world demand has increased from a base year to a final year in relation to other commodities.	$\frac{M_i^{fy}}{M^{fy}} > \frac{M_i^{by}}{M^{by}}$ and $\frac{M_{ij}^{fy}}{M_j^{fy}} > \frac{M_{ij}^{by}}{M_j^{by}}$
Declining stars: A declining star refers to an export commodity whose percentage of exports increased in a stagnant commodity market i.e. where the share of world demand has decreased from a base year to a final year in relation to other commodities.	$\frac{M_i^{fy}}{M^{fy}} < \frac{M_i^{by}}{M^{by}}$ and $\frac{M_{ij}^{fy}}{M_j^{fy}} > \frac{M_{ij}^{by}}{M_j^{by}}$
Missed opportunity: A missed opportunity refers to an export commodity that experiences a decline in its percentage of exports in a dynamic commodity market i.e. where the share of world demand has increased from a base year to a final year in relation to other commodities.	$\frac{M_i^{fy}}{M^{fy}} > \frac{M_i^{by}}{M^{by}}$ and $\frac{M_{ij}^{fy}}{M_j^{fy}} < \frac{M_{ij}^{by}}{M_j^{by}}$
Retreats: A retreat refers to an export commodity whose percentage of exports have fallen in a stagnant commodity market i.e. where the share of world demand has declined from a base year to a final year in relation to other commodities.	$\frac{M_i^{fy}}{M^{fy}} < \frac{M_i^{by}}{M^{by}}$ and $\frac{M_{ij}^{fy}}{M_j^{fy}} < \frac{M_{ij}^{by}}{M_j^{by}}$

Source: TradeCAN methodology (2010)

Note: M – value of total imports, i – a commodity, j – an exporter country, M_j – imports from exporter country j ¹⁷ and M_{ij} – imports of commodity i originating from the exporting country j .
 M_i – imports of commodity i , $()^{by}$ – base year, $()^{fy}$ – final year

¹⁷ TradeCAN assumes that total exports is equal to total imports, so M_j is the same as country j exports to the import market.

Table 8: Competitiveness Matrix for T&T Exports to CARICOM

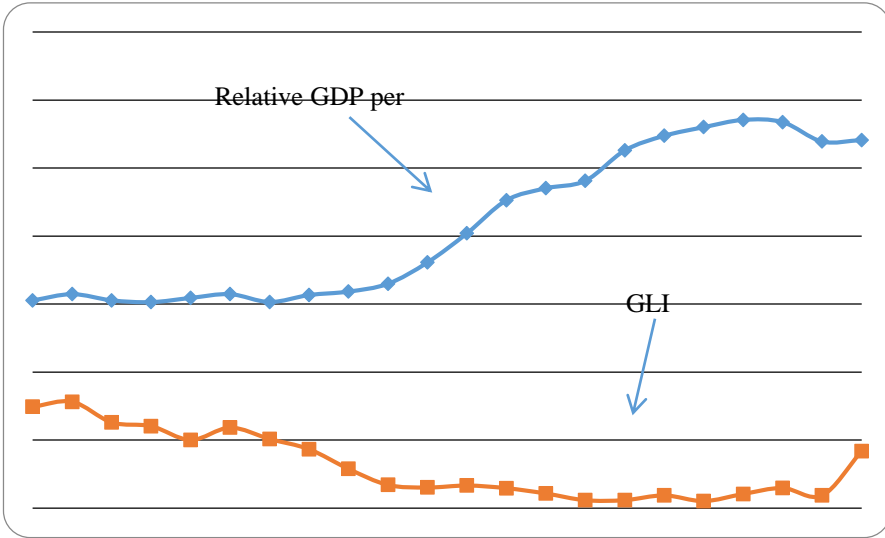
SITC 4 digit	Commodity description	Type Star* (2000-2010)	per cent of exports (2010)
3413	Petroleum gases and other gaseous hydrocarbons, n.e.s., in the li	Rising stars	22.33
1110	Non-alcoholic beverages, n.e.s.	Rising stars	14.97
1222	Cigarettes	Rising stars	4.32
5542	Organic surface-active agents; surface-active preparations and wa	Rising stars	4.12
6421	Boxes, bags and other packing containers, of paper or paperboard;	Rising stars	3.79
6428	Articles of paper pulp, paper, paperboard or cellulose wadding, n	Rising stars	3.06
8931	Articles for the conveyance or packing of goods (including contai	Rising stars	2.52
6731	Wire rod of iron or steel	Rising stars	2.41
6998	Articles, n.e.s., of copper, nickel, aluminium, lead, zinc and ti	Rising stars	1.44
8921	Book, pamphlets, maps and globes, printed	Rising stars	1.23
6424	Paper and paperboard, cut to size or shape, n.e.s.	Rising stars	1.18
7731	Insulated (including enamelled or anodized) electric wire, cable,	Rising stars	1.08
8928	Printed matter, n.e.s	Rising stars	0.94
6651	Containers, of glass, of a kind commonly used for the conveyance	Rising stars	0.9
7781	Batteries and electric accumulators, and parts thereof, n.e.s.	Rising stars	0.66
5831	Polyethylene	Rising stars	0.65
5834	Polyvinyl chloride	Rising stars	0.64
6612	Portland cement, ciment fondu, slag cement, super-sulphate cement	Retreats	1.13
6353	Builders' carpentry and joinery (including pre-fabricated and sec	Retreats	0.97
0589	Fruit otherwise prepared or preserved, n.e.s., whether or not con	Retreats	0.52
6732	Bars and rods (excluding wire rod), of iron or steel; hollow min	Missed Opportunities	0.81
0484	Bakery products (e.g., bread, biscuits, cakes) and other baked go	Declining stars	2.52
0980	Edible products and preparations, n.e.s.	Declining stars	2.26
8939	Miscellaneous articles of the materials falling within division 5	Declining stars	1.14
6872	Tin and tin alloys, worked	Declining stars	1.03
1123	Beer made from malt (including ale, stout and porter)	Declining stars	0.91
0483	Macaroni, spaghetti and similar products	Declining stars	0.56
6417	Paper and paperboard, corrugated, creped, crinkled, embossed or p	Declining stars	0.54
6423	Registers, exercise books, note books, memorandum blocks, order	Declining stars	0.53

Source: Own calculations from TradeCAN (2012). Results only include commodities that comprise more than 0.5 per cent of total exports in the final year.

Table 9: T&T GLI with selected Bilateral Trading Partners and relative GDP per capita between T&T and various bilateral trading partners (constant 2000 \$US)								
	Barbados		Guyana		Jamaica		St. Lucia	
	GLI	GDP per capita	GLI	GDP per capita	GLI	GDP per capita	GLI	GDP per capita
1991	0.30	0.61	0.05	7.73	0.26	1.52	0.09	1.19
1992	0.31	0.63	0.08	7.00	0.26	1.47	0.06	1.09
1993	0.25	0.61	0.08	6.33	0.22	1.32	0.05	1.06
1994	0.24	0.61	0.10	6.01	0.18	1.35	0.07	1.10
1995	0.20	0.62	0.11	5.93	0.17	1.37	0.10	1.12
1996	0.24	0.63	0.08	5.68	0.18	1.44	0.08	1.11
1997	0.20	0.61	0.07	5.47	0.14	1.50	0.08	1.15
1998	0.17	0.63	0.06	5.98	0.10	1.66	0.08	1.18
1999	0.12	0.64	0.07	6.04	0.10	1.72	0.07	1.21
2000	0.07	0.66	0.05	6.49	0.09	1.81	0.03	1.29
2001	0.06	0.72	0.05	6.60	0.06	1.87	0.05	1.42
2002	0.07	0.81	0.06	7.06	0.07	1.99	0.08	1.54
2003	0.06	0.91	0.03	8.16	0.06	2.22	0.08	1.70
2004	0.04	0.94	0.03	8.53	0.06	2.36	0.07	1.70
2005	0.02	0.96	0.02	9.20	0.03	2.47	0.06	1.85
2006	0.02	1.05	0.01	9.90	0.03	2.70	0.04	1.93
2007	0.04	1.10	0.02	9.68	0.05	2.78	0.06	2.01
2008	0.02	1.12	0.03	9.72	0.03	2.87	0.04	1.97
2009	0.04	1.14	0.04	9.08	0.04	2.85	0.07	1.92
2010	0.06	1.14	0.02	8.69	0.01	2.88	0.04	1.92
2011	0.04	1.08	0.02	7.87	0.02	2.71	0.05	1.84
2012	0.07	1.08	0.05	7.65	0.03	2.72	0.07	1.85

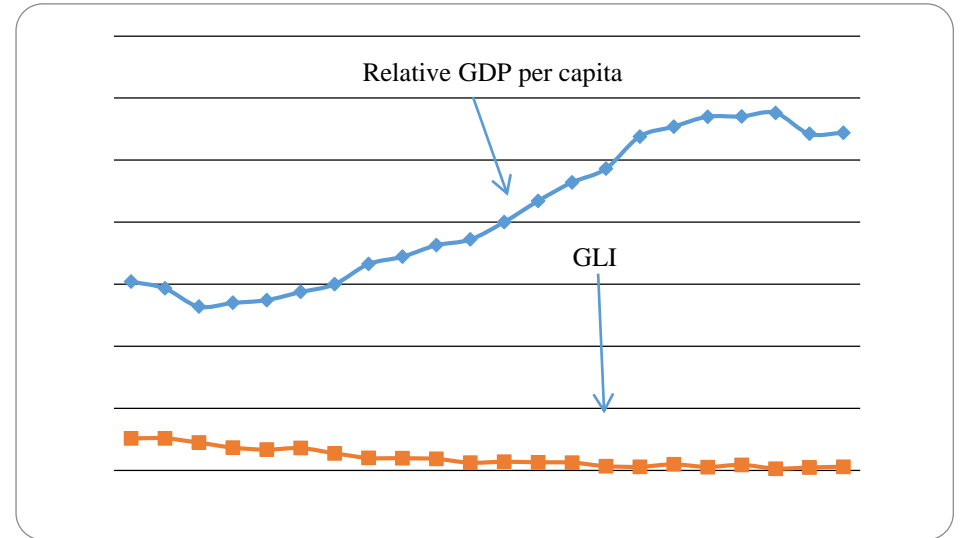
Source: GDP Data: World Development Indicators Databank (2013), World Economic Outlook (various years) and Own Country Reports (various years).
GLI Data: UN COMTRADE (2013) database and Central Statistical Office of T&T (2014) and own calculations.

Figure 2: T&T/Barbados GDP per capita and bilateral GLI



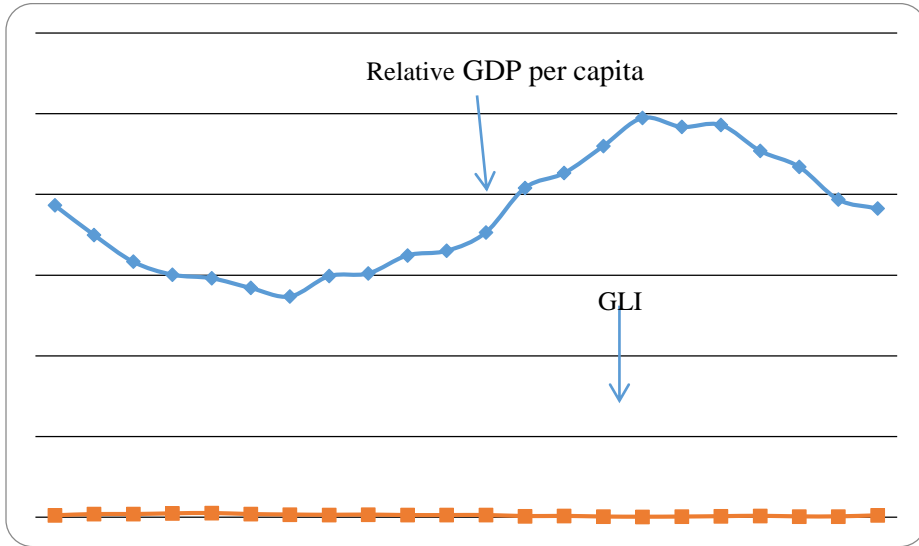
Source: United Nations Commercial Trade (UN COMTRADE) Database (2013) and own derivations

Figure 4: T&T/Jamaica GDP per capita and Bilateral GLI



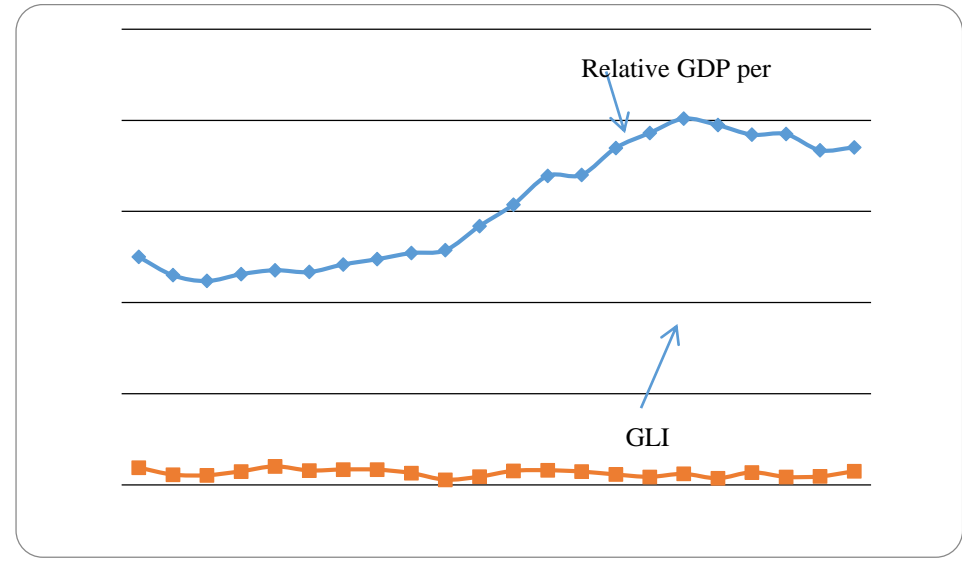
Source: United Nations Commercial Trade (UN COMTRADE) Database (2013) and own derivations

Figure 3: T&T/Guyana GDP per capita and Bilateral GLI



Source: United Nations Commercial Trade (UN COMTRADE) Database (2013) and own derivations

Figure 5: T&T/St. Lucia GDP per capita and Bilateral GLI



Source: United Nations Commercial Trade (UN COMTRADE) Database (2013) and own derivations

	United States		United Kingdom		Canada	
1991	0.17	0.08	0.24	0.04	0.25	0.05
1992	0.18	0.04	0.25	0.07	0.27	0.05
1993	0.17	0.05	0.25	0.04	0.26	0.33
1994	0.17	0.06	0.24	0.04	0.25	0.11
1995	0.17	0.06	0.23	0.04	0.25	0.12
1996	0.17	0.09	0.24	0.06	0.25	0.07
1997	0.17	0.09	0.24	0.05	0.26	0.08
1998	0.17	0.08	0.24	0.07	0.26	0.05
1999	0.17	0.11	0.24	0.12	0.27	0.05
2000	0.18	0.04	0.25	0.03	0.26	0.06
2001	0.18	0.15	0.25	0.10	0.27	0.04
2002	0.19	0.07	0.25	0.08	0.28	0.03
2003	0.20	0.04	0.27	0.07	0.29	0.07
2004	0.22	0.05	0.30	0.03	0.33	0.12
2005	0.23	0.04	0.31	0.07	0.35	0.09
2006	0.24	0.03	0.32	0.06	0.36	0.04
2007	0.27	0.05	0.36	0.06	0.40	0.02
2008	0.28	0.05	0.36	0.05	0.41	0.04
2009	0.19	0.06	0.25	0.16	0.28	0.08
2010	0.19	0.05	0.25	0.03	0.27	0.01
2011	0.18	0.09	0.25	0.08	0.27	0.02
2012	0.18	0.00	0.25	0.08	0.26	0.16

Source: World Development Indicators Databank (2013), World Integrated Trade Solution (2013), Caribbean Development Bank (2013) and Individual Country Reports (various years).

	Barbados	Guyana	Jamaica	St. Lucia	USA	UK	Canada
1992	0.08	0.08	0.19	0.05	0.03	0.03	0.04
1993	0.09	0.08	0.02	0.04	0.04	0.03	0.27
1994	0.13	0.04	0.07	0.05	0.05	0.05	0.32
1995	0.06	0.08	0.03	0.05	0.09	0.03	0.05
1996	0.15	0.04	0.07	0.01	0.04	0.02	0.03
1997	0.08	0.03	0.04	0.04	0.06	0.06	0.03
1998	0.06	0.01	0.08	0.01	0.08	0.05	0.02
1999	0.03	0.02	0.04	0.02	0.08	0.08	0.02
2000	0.04	0.03	0.03	0.01	0.03	0.07	0.02
2001	0.03	0.03	0.05	0.04	0.18	0.11	0.03
2002	0.02	0.04	0.05	0.01	0.10	0.08	0.03
2003	0.02	0.01	0.01	0.04	0.02	0.09	0.05
2004	0.03	0.02	0.01	0.06	0.02	0.02	0.03
2005	0.01	0.01	0.00	0.03	0.02	0.05	0.04
2006	0.01	0.01	0.02	0.02	0.02	0.05	0.04
2007	0.01	0.01	0.01	0.03	0.04	0.05	0.01
2008	0.01	0.02	0.00	0.01	0.02	0.04	0.02
2009	0.01	0.01	0.00	0.00	0.04	0.11	0.02
2010	0.01	0.02	0.01	0.04	0.04	0.19	0.03
2011	0.01	0.02	0.03	0.01	0.04	0.02	0.01
2012	0.03	0.02	0.01	0.00	0.01	0.07	0.01

Source: Own derivations from United Nations Commercial Trade (UN COMTRADE) Database (2013)