

## International standards and international trade evidence from Caricom economies

Densil Williams / densil.williams@uwimona.edu.jm  
The University of the West Indies

Recibido: 21 de octubre de 2011

Aceptado: 7 de septiembre de 2012

### ■ ABSTRACT

This paper analyzed the relationship between international standards and international trade between United States, a developed economy and countries in Caricom, a regional integration movement of small, developing economies in the Caribbean. The empirical literature on the relationship between standards and international trade is very limited. This is especially so for small, developing economies like those in Caricom. To advance this literature, the paper used an augmented gravity model with panel data for 14 Caricom countries for the period 1991-2009 to test the relationship. The estimated model showed that economic size and distance, not international standards, are the most significant factors that determine trade flows between Caricom and the United States. In other words, international standard of quality is treated as a sunk cost in conducting international business/trade.

**Key words:** international standards, Caricom, trade, panel data

### ■ RESUMEN

En este artículo se analiza la relación entre los estándares internacionales y el comercio internacional entre Estados Unidos, una economía desarrollada, y países de Caricom, una iniciativa de integración regional de economías en vía de desarrollo en el Caribe. La literatura empírica sobre la relación entre el comercio estándar e internacional es muy limitada, sobre todo la literatura enfocada en economías en desarrollo como las de Caricom. Como aportación a la literatura, en este estudio se usa un modelo de *augmented gravity* con un panel de data de 14 países pertenecientes a Caricom, del período de 1991 al 2009, para poder establecer una relación. El modelo utilizado demostró que el tamaño de la economía y la distancia son los factores más

significativos que determinan el flujo del comercio entre Caricom y Estados Unidos, y no los estándares internacionales. En otras palabras, la calidad del estándar internacional es tratada como costo incurrido (*sunk cost*) cuando se lleva a cabo comercio y negocio internacional.

**Palabras clave:** estándares internacionales, Caricom, comercio, panel de data

## INTRODUCTION

There is a plethora of studies looking at why countries trade and the factors that impact on the level of trade. These studies date back as far as David Ricardo 19<sup>th</sup> century theory of comparative advantage which posits that countries trade because they have a comparative advantage in the goods and services they produce compared to their trading partner. This comparative advantage, according to other theorists (e.g. Hecksher-Olin) is derived from the factor endowments that countries are endowed with. Furthermore, others argue that factor endowments alone may not explain international trade since countries that are not endowed with any natural endowments, are still heavily engaged in international trade. It is therefore; competitive advantage that explains why they are able to engage in international trade and not comparative advantage (Porter, 1990; Wint, 2003). Comparative advantage focuses on countries acquiring resources that they are not endowed with and converting these resources into value added goods and sell them on the international market. These principles of trade are grounded in the theoretical rationale of free trade where there are little or no barriers to trade. Indeed, since the establishment of the GATT in 1948, the barriers to trade mainly in the form of tariffs have decreased substantially. However, trade still has not delivered on the maximum benefits that free trade is purported to offer to nations. There remains a big question as to why this is the case.

Trade researchers have posited that although the tariff barriers have reduced substantially, free trade still does not deliver enormous benefits to nations because there is a rise in technical trade barriers

(TTBs) which come in the form of standards (Clougherty & Grajek, 2009; Deardorff & Stern, 1998; Wilson & Bray, 2010). Standards can be both national and international. National standards result from countries setting technical trade barriers in order to protect their local industries. Countries can determine for example, the amount of ingredients that go into a particular product or even the design and aesthetic appeal of the product. International standards on other hand are set by multilateral bodies which govern standards in production and distribution across the globe. For example, the ISO 9000 standard is a quality assurance mechanism set by the International Organization of Standards, a Geneva based international institution which has as its aim, the development of standards to enhance global trade.

Standards are not always bad, although they are considered to be technical barriers to trade. Trade scholars have argued that standards do have the potential to both decrease and also expand trade. Some argue that international standards have the potential to expand trade more than national standards (Moenius, 2004; Shepherd & Wilson, 2007). The evidence as to whether standards, national or international, increases or decreases trade is still inconclusive. Despite this inconclusiveness, the literature seems to lack adequate empirical evidence to determine the directionality of the impact of standards on trade (Blind, 2004; Moenius, 2006). This problem seems to be even more glaring when one looks at the evidence from small, developing economies which are mostly affected by the imposition of international standards. The general line of argument pursued is that standards harm the export of goods from these economies. It is argued that the cost of implementing standards is really exorbitant and as such, it places a huge burden on developing country producers to adhere to international standards to get their goods into global markets (Clougherty & Grajek, 2009; Wilson & Bray, 2010). However, using comtrade data to analyze the impact of HACCP on fish exports from Guyana to the USA, DaSilva (2010) concluded that standards can be a catalyst for competitiveness and that the perceived cost of the implementation are often times less than assumed, given the impact on consumer confidence and demand in the international market. Given this evidence, it is clear

that the impact of standards on trade even in small, developing economies is still ambiguous. As such, the call by trade researchers (Maskus et al., 2000) for more information about the quantitative implication of standards on export is quite timely and relevant.

This research aims to make a contribution to this literature by analyzing the impact that international standards have on the trade flow from Caricom countries to the United States, the main trading partner for Caricom. While there is some work on standards and trade in Caricom (DaSilva, 2010), these works focus on individual countries and not Caricom as a regional movement. This study will go beyond this piecemeal method and investigate the impact of standards on all member states of Caricom. It will try to answer the research question: *what is the impact of international standards on trade between Caricom countries and the United States?* To help answer this question, the study will use a 19 year panel data for 14 members of the regional integration movement Caricom, to test the null hypothesis that international standards impact negatively on trade from developing economies. This hypothesis is important given the overwhelming evidence to suggest that developing countries loose out when international standards are imposed on their trade relations with the developed world. The novelty in this work is that it will provide evidence from a unique context that has not achieved much attention in the literature before. This information will add to the body of knowledge as requested by other researchers who call for more information on the subject.

To meet the objectives of this research, the paper is organized as follows. The next section will look briefly at the background to trade between Caricom and the USA. Following this discussion, there will be a reflection on the literature related to standards and international trade. Here, the paper will focus on some of the arguments for and against international standards and trade. It will also give some background to two of the most pervasive standards in the developing world, International organization of standard (ISO) and Hazard analysis and critical control points (HACCP). The paper will then look at the research method and provide a rationale for the selection of the research model. Subsequent sections will look at the research results and provide a discussion of these results. The paper

will end with some concluding remarks and implications for policy development.

## **TRADE BETWEEN CARICOM AND THE US**

When Caricom was established in 1973 through the signing of the treaty of chaguaramas, the idea was to have a single market for the movement of goods and services. Members of this integration movement would trade among themselves and also engage in trading with extra regional partners. The United States of America, the worlds' largest and wealthiest economy with a Gross Domestic Product (GDP) of over US\$13trillion is Caricom's top trading partner. In 2008, Caricom exported over U\$12billion worth of goods to the US and imported over US\$11billion in goods and services. The extractive industries (liquefied natural gas, aluminum, crude petroleum. etc.) account for a significant portion of the region's exports to the USA. The services sector presents a good opportunity for Caricom to expand its exports to the USA, given the growing demand for services (transportation, insurance, business service, recreational, cultural) in the economy. In 2007, the US spent US\$387 billion on imported services, a 7 percent increase over the previous year. Caricom countries, especially those not endowed with natural resources like those in the extractive industry, have export capacity in the services sector and as such can find opportunities in the export market in the USA.

The US also has trade preferences for Caricom countries. The region receives duty free preferences into the USA under the Caribbean Basic Economic Recovery Act (CBERA) and the Caribbean Basin Trade Partnership Act (CBTPA). Both agreements provide opportunities for Caricom countries to sell most of their goods duty free in the US market. Some of these products include footwear, canned tuna, apparel, watches, watch parts and handmade folklore articles. Interestingly, while the duty-free status of these goods should increase the amount exported, Caricom's exports to the US market has not increased significantly over 2008. In the first quarter of 2009, export revenue for Caricom declined by 41 percent

over 2008. It appears therefore that while trade barriers have come down, technical barriers to trade (standards) have increased thus impacting Caricom's ability to increase its level of exports to the USA. It will be interesting to see whether or not international standards do impact on Caricom's exports to the US. The literature argues that the imposition of standards do impact negatively on developing countries exports (Maskus et al., 2000). Caricom consist of only developing countries that trade with a developed country, the USA. It is important, therefore, to see if this hypothesis from the literature holds in this context.

### **STANDARDS AND INTERNATIONAL TRADE – SOME EVIDENCE**

The impact of standards on international trade is not without its controversy. The literature on standards makes a distinction between international and national standards. International standards have to do with rules on quality standards set by international bodies such as the International Standards Organization in Geneva which sets ISO 9000 standards. National standards on the other hand look at rules on quality that are set by domestic organizations. For example, the bureau of standards in Jamaica sets rules on labeling, product contents, etc. for products that enter the Jamaican market. Both sets of standards, national and international, will have an impact on international trade. However, the directionality of the impact is still not settled.

One strand of research in the literature argues that international standards impact positively on international trade because it has the ability to expand trade when compared to national standards (Moenius, 2004). On the other hand, Swann et al. (1996) noted that national standards are more beneficial to trade than international standards. Indeed, scholars argue that international standards can be bad for trade if they instill a protectionist agenda. It is reasoned that large buyers and consumers demand that production of the items adhere to a certain international standards which are generally costly for those producers with very limited financial resources (Clougherty & Grajek, 2009). However, since international standards are not

attached to a specific country, they are seen as less protectionist when compared to national standards. National standards are more protectionist and are geared towards the protection of local firms. It is in this light that scholars see them as less beneficial to international trade.

The research in this paper is more concerned with international standards impact on trade. While national standards are also critical, international standards are generally seen as inimical to exports from developing countries given the significant cost of compliance and the relatively small amount of resources they have in order to meet these standards (Maskus et al., 2000; Clougherty & Grajek, 2009). Although there is this negative effect, the literature also argued that international standards can lead to significant benefits for international trade as there are a number of positive effects that can emanate from international standards. The most important standards that this paper will focus on are HACCP and ISO 9000, 14000 which seem to have the most important impact on trade in developing countries. Both standards were developed with the intention of increasing quality and safety of products that are sold on the international market.

Generally, it is argued that standards can result in an increase in the international competitiveness of a home-nation's products as they are seen as signals for high quality and safety. This increased confidence in quality and safety will lead firms to be more willing to take on exports thus seeing an expansion in exports from a nation. Furthermore, the adoption of international standards can lead to internal efficiency gains and quality improvements in local firms which will augment their export efforts. This diffusion of standards is an important benefit to the home nation.

Another important benefit to be gained from the adoption of international standards results from the transaction cost side of doing international trade. International standards such as ISO and HACCP are really proxies for conformance of a country's products to international specifications and also signal the superior performance of the products over other suppliers who are not certified by these standards. Therefore, when buyers are faced with multiple suppliers, with an international certification, the cost of search is reduced and

also, the suppliers' cost for search for market is reduced. Therefore, the cost for selling to the international market is reduced. When buyers are not able to see the intangible attributes of the products that they buy, international certification serves as a confidence booster that the product is superior to those without this certification. This will better help to facilitate trade and export growth.

When a country adopts international standards, it can also lead to positive information flow that will enhance the export potential of national firms. In developing nations where there is no strong institutional framework for detecting quality, adopting of an international standard such as the ISO standards, offers a signal of firms commitment to quality. This confidence in quality enhancement can lead to enhanced exports for the host-nation once the standard is diffused widely where all firms can benefit.

International standards also serve as a sort of common language that will facilitate trade if both parties are aware of the coded nature of the language. Standards such as the ISO involve information on the internal production system used to produce the product. Buyers from other jurisdictions will be aware of this information and therefore can judge the quality of the goods or services produced. Furthermore, the common language in international standards can be used to facilitate business to business dealings once both ends of the bargain understand the coded nature of the language. Indeed, Benezech et al. (2001) noted that ISO 9000 series can be viewed as a code, a language used by firms. The common procedure of most international standards such as the ISO series helps to lower information asymmetries between businesses thus leading to lower transaction costs and also, lower search cost (Clougherty & Grajek, 2009).

Having a common language for international trade also helps to enhance trade flows because of the reduction in the informal barrier to trade, which results from inadequate information about opportunities in the global marketplace. With common international standards, this will promote like-minded businesses to work together in the international trading environment. Likeminded businesses working together will lower information asymmetries and search cost of doing business, internationally. It will also help businesses

identify opportunities for their business to sell to other geographical markets. In other words, standards can serve as a network for businesses that adhere the coded language embodied in them. This network effect can be used to enhance exports by identifying where the opportunities reside in each geographic market, and based on the relationship that firms have, it can also determine which market they export to. Both the network and language effects that can result from international standards will no doubt redound to the benefit of increased exports for a nation as they can result in reduction in the cost of information and search for markets. This is even more so for small, developing nations where the cost of information and search can be quite exorbitant and beyond their resource capacity.

Although international standards result in significant benefits to enhance the competitiveness of exports from a country, the compliance cost for these standards sometimes results in countries not being able to benefit from the positive effects. This is especially true for smaller, developing economies that are not able to afford the cost of compliance (Blind, 2004; Maskus et al., 2000; Czubala et al., 2007). Firms within a country will have to pay an implementation cost in order to benefit from international standards. For example, trade scholars (Blind, 2004) have estimated that the cost for ISO 9000 series certification will cost a firm between US\$50,000-US\$250,000. This amount, in some cases, is more than the sales for one year for a small firm from the Caricom region. The majority of firms from Caricom are not even considered to be small firms but nano-firms (Bernal, 2006), given the very small size of their sale revenue and production capacity. In order to become certified, firms must adopt manufacturing design, reorganize their production systems and comply with a large number of certification and testing procedures. These costs can be exorbitant for the nano-firms from Caricom. With this exorbitant cost burden, compliance to international standards can become a hindrance to firms from small, developing economies that want to engage in international trade.

In summary, this section has looked at the various impacts that international standards may have on international trade. The extant literature shows that the effects on standards varies in both directions and is not only positive or negative as some protagonist may argue.

On the positive side, the literature shows that international standards may lead to improve competitiveness for firms in nations that adopt these standards because it signals a commitment to quality and improvements in internal operations which are critical for sales on the international market (Bernal, 2006). Moreover, international standards operates like networks in that, it has coded language and once it creates like-minded firms, this helps to reduce the cost of search and information asymmetries thus better facilitating international trade. The networks will also help firms to become aware of opportunities that would once be difficult to come by, due to inadequate information. On the flip side, international standards can hinder exports from a country, especially poor countries because of the high compliance cost and the cost to be certified. This is especially true when a country has a large number of firms that are small and have poor resources.

Given the poor resource capacity of the firms in Caricom, it is thought that the cost of compliance and certification for international standards is exorbitant and not many firms can afford it. If firms are not able to afford it, this sends a signal of low quality products and as such, makes it difficult for firms to sell on the international market. Based on this consideration, this study has therefore put forward the following working hypothesis:

$H_1$ : INTERNATIONAL STANDARDS IMPACT NEGATIVELY ON THE EXPORT OF GOODS FROM CARICOM TO THE UNITED STATES.

## STUDY METHOD AND MODEL SELECTION

To analyze the impact of international standards on international trade from Caricom countries to the United States, an acceptable framework has to be used to ground the analysis. Traditionally, international trade flows are analyzed using a gravity model. The model basically normalizes trade flows between two countries incorporating several factors that facilitate or hinder trade. It basically argues that trade between two countries are proportional to the economic size of the trading parties and inversely proportional

to the distance or trade barriers between the parties. In other words, the gravity model argues that economic size and distance are the main factors that influence trade between two countries. However, given the complex array of factors that have an impact on trade in today's, globally integrated world economy, size and distance alone cannot be used to explain trade flows. A growing concern for most developing countries is the role of international standards in determining trade flows; especially between the North and the South<sup>1</sup>. Therefore, to identify the effects of international standards on trade relations between two countries, the traditional gravity model has to be augmented to facilitate the inclusion of this new variable. The model presented below will show this augmented form.

### ***THE MODEL SELECTION***

To analyze the problem at hand, the model allows for international standards to be incorporated into the analysis. The following specification represents the model used<sup>2</sup>:

$$\ln Y_{us/car} = \beta_0 + \beta_1 \ln(\text{RGDPP}_{car}) + \beta_2 \ln(\text{DIST}_{us/car}) + \beta_3 \text{Stds}_{car} + \beta_4 \ln(\text{Ex}_{us/car}) + \varepsilon_{ij} \quad (1)$$

Where:

$Y_{us/car}$  is the real exports from Caricom to the USA (REXP).

$\text{RGDPP}_{car}$  is the real per capita income of Caricom countries, a measure of the economic size.

$\text{DIST}_{us/car}$  is the geographical distance between US and Caricom countries.

$\text{Std}_{car}$  is the critical variable of international standards. It is represented by a dummy variable, in which a country has or hasn't adopted the international

<sup>1</sup> North and South are used in the international development literature to refer to developed and developing countries. The North represents developed countries while the South represents developing countries. See Beckford (1983).

<sup>2</sup> See the International Trade Centre UNCTAD/WTO report of May 2003: "A gravity model for trade potential for developing countries and economies in transition" (page 37), for an example of the specification of this model. Also, see Egger and Pfaffermayr (2003), for a general specification of this model.

standard. If the international standard, that is, ISO or HACCP is adopted by a country, it gets a 1 and 0 otherwise.

$Ex_{us/car}$  is the exchange rate between US and Caricom countries. This variable is incorporated in order to reflect the importance of price in the international trading environment. Price does have an impact on the trade flow between countries as indicated in the existing literature on international trade (Krugman & Obstfeld, 2003).

$\varepsilon_{ij}$  is the error term in the model.

To empirically test this augmented gravity model, a 19 year panel data spanning 1991-2009 on 14 members of the 15 member Caricom groups was used. There were too many missing data for Montserrat, so this member was excluded from the analysis. The data for the analysis were collected from various sources such as UN-COMTRADE, CARICOM Stats, the International Financial Statistics published by the International Monetary Fund (IMF), Economic Commission for Latin America and the Caribbean-ECLAC, and the World Bank. A fixed effect model was estimated using the Eviews 6 and SPSS version 16 econometric software<sup>3</sup>. The result from this estimated model is reported in the next section.

## RESULTS

In order to provide further insights into the results presented below, a description of some of the variables used in the study is presented. The average per capita income for the panel data was US\$5374 with the Bahamas having the highest at US\$18364 and Haiti with the lowest at US\$381. The average of real exports to the US from the Caricom countries studied is US\$368969250. In addition, as it relates to distance, the average distant in miles is 3029. The Bahamas is the closest to the US while the farthest is Suriname. These statistics put into context the findings of the works as presented in the tables below.

---

<sup>3</sup> To test the sensitivity of the findings a random effects model was also analyzed and the 2009 data removed to see if they were causing any undue influence on the results. The analysis revealed that the fixed effect model and the random effect models produced almost equal results.

The gravity model presented in equation 1 was used to determine the impact of international standards on international trade between Caricom countries and the United States, a developed economy. The results as reported in Table 1 reveal that the economic size, as measured by GDP per capita, and distance are the main factors that determine trade between both nations, not international quality standards nor the price of goods and services as measured by the exchange rate.

**Table 1:**  
*Regression results for full model*

Variables	$\beta$	T-statistic	P < 0.05
Constant	65.306	4.680	.000
GDPP	-.541	-2.717	.007*
DIST	-7.089	-4.039	.000*
Std	.484	.551	.582
Ex	.281	1.056	.292
R <sup>2</sup>	8%		
Adjusted R <sup>2</sup>	6%		
F-Statistic	5.41**		
N	266		

Dependent Variable: REXP

\*= variable significant at the 5% level of significance

\*\*= significant at the 5% level of significance

Indeed, at the 5 percent level of significance, the variables that came out significant from the estimated model are: Gross Domestic Product Per Capita (GDPP) and Distance (DIST). The presence of international quality standards (Std) and Exchange rate (Ex) were not significant in the estimated model. Their p-values were higher than the conventional 5 percent acceptance level (i.e.  $p < 0.05$ ).

The co-efficient on the logarithmic form of the variables represent the elasticity of the variable. In other words, a 1 percent change in the value of the variable will result in a beta percentage change in the dependent variable. In this research, the results suggest that, if percapita income in Caricom countries were to increase by 1 percent, exports to the US will decrease by 0.5 percent. Similarly, if there is a 1 percent increase in the distance of a country from the US, exports will fall by 7.1 percent. Moreover, although not statistically significant, the results suggest that if the exchange rate depreciates by 1 percent, exports will increase by 0.28 percent. Intuitively, the results make sense. They will be explored further in the discussion section of the paper.

To ensure that these results are robust, the model was estimated using only the variables that emerged as significant. The results from this analysis as revealed in Table 2 suggest that the variables are indeed stable and robust. Both variables emerged as significant and the model diagnostics (e.g  $R^2$ , adjusted  $R^2$  etc) did not change significantly either.

**Table 2:**  
*Sensitivity test on significant variables*

<b>Variables</b>	<b><math>\beta</math></b>	<b>T-statistic</b>	<b>P&lt; 0.05</b>
Constant	60.48	4.30	0.00
GDPP	-.48	-2.5*	0.01
DIST	-6.40	-4.0*	0.00
R <sup>2</sup>	7%		
Adjusted R <sup>2</sup>	6%		
F-Statistic	10.00**		
N	266		

Dependent Variable: REXP

\*= variable significant at the 5% level of significance

\*\*= significant at the 5% level of significance

Additionally, to ensure that the model does not violate key classical assumptions of a gravity regression, and that a significant variable does not end up being non-significant (Type II error), the model was tested for the presence of multi-collinearity. Since the Pearson R statistic does not pick up subtle forms of multi-collinearity, this paper adopted the more robust test of analyzing the variance inflation factor and the tolerance statistics. If the variance inflation factor reaches 10, it suggests that multi-collinearity may be present in the model. Furthermore, if the tolerance statistic shows values below 0.1, this is also evidence to suggest that multi-collinearity might be present in the model. From the results presented in Table 3 below, multi-collinearity does not appear to be a serious problem in the model. The VIF in all cases are below 10 and the Tolerance statistics are above 0.1 in all cases.

**Table 3:**  
*Results of multicollinearity test*

<b>Variables</b>	<b>Tolerance Statistic</b>	<b>VIF- Statistic</b>
GDPP	.921	1.086
DIST	.859	1.164
Std	.990	1.010
Ex	.821	1.218

The results presented in this section are interesting and shed new light on the issue of trade between USA, a developed economy and other countries in Caricom, a regional integration movement comprising of small, developing economies. In some cases, the results corroborate the findings of previous works in the literature while in other cases it provides some unique findings for the particular context in which the work was carried out. The next section of the paper will explore these results in more detail.

## DISCUSSION

The empirical literature on the international standards and international trade is still limited. A number of arguments have been put forward which posit that international standards impact negatively on trade flows between developing and developed economies. However, very few empirical works exist to test these propositions. This is even more so in the case of small, developing economies from the Caribbean. This study has advanced this work by empirically testing the relationship between international standards and international trade from Caricom, a context that is hardly studied in the present literature. The insights from this study will go a far way in advancing the knowledge on this subject.

The results from the analysis of the data on international standards and international trade suggests that it is the size of the economy and the distance of the economies in Caricom from the United States that are most critical in determining trade flows between both nations, not the adherence to international standards. In other words, the variable which captures international standards (mainly ISO and HACCP) was not found to be significant in the estimated model. As such, the hypothesis which formed the basis of this study was not supported. The interpretation is that, when Caricom countries are seeking to trade with the United States, the imposition of international standards such as ISO and HACCP are not the main factors which determine trade flows. Trade flows are determined by economic size and distance. From the model, it is suggested that a 1 percent increase in per-capita income will lead to a 0.5 percent reduction in real exports to the US. Similarly, a 1 percent increase in the distance that a Caricom country is from the US, it will result in a 7.1 percent reduction in exports to that country. The results from this work correspond well with the standard results in the literature (see DaSilva, 2010; Wilson & Otsuki, 2004). Indeed, DaSilva (2010), looking at the impact of HACCP standards on fish exports from Guyana to the USA, found that per capita income and distance were important factors in determining trade flows. Also, Wilson & Bray (2010), looking at the impact of HACCP on seafood exports to the US, found that distance and economic size

are important variables. They did not find a direct significant effect of HACCP on exports of seafood to the USA.

The direct effect of international standards such as HACCP and ISO standards may not have been felt in this model and also in Wilson and Bray (2010), because of a number of reasons. Small countries, like those in the Caricom, do not have much clout to prevent the imposition of international standards. As such, they have to merely adhere to whatever standards are put in place by developed countries to improve the quality of products that are sold in their markets. So, if small economies want to sell their outputs to the developed markets in North America, Europe and Asia, they have no option but to adhere to the standards imposed. If they cannot meet these standards, they will simply have to abandon their efforts at exporting to developed markets. As such, since small developing countries such as those in Caricom accept this fact, when they are thinking about international trade with developed economies, standards are not the most important determinant. They have no choice but to adhere if they want to sell in the developed markets. Therefore, other variables such as distance and economic size become more important.

Despite international standards not having a direct impact on exports from Caricom to the US, it is clear that policymakers will have to ensure that all firms adhere to these standards because without this adherence, exports from Caricom will have to be abandoned. The lack of statistical significance does not mean that standards are unimportant for international trade. Caricom countries have no choice but to adhere to these standards. Therefore, policymakers have to ensure that the right enabling environment is in place to ensure that firms attain these certifications. Governments can help by providing assistance with capacity building, especially in smaller firms who may not have the resources prepared for certification.

Similar to most studies in the extant trade literature, distance is seen as a critical variable in determining the international trade between developed and developing countries. This study found the variable distance to be statistically significant and negative. This suggests that the further away a Caricom country is from the US, the lower will be its levels of exports to that market. This result is

common for a gravity model of this type. The further the distance from the market, the higher will be the cost to get into that market. This is further exacerbated by poor infrastructure to transport goods to ports for exports. In some Caricom countries, the sea and airport infrastructures are not well developed and this poses serious challenges for firms to get their products to the export market. These conditions combined with long distance from the main export market can lead to a reduction in the amount of exports from a country. Since countries cannot change the distance that they are from their export markets, the policy implication is that they have to develop their infrastructure to an international standard so that they can increase the speed of transportation to the export market.

The present literature also argues that economic size is a significant variable that determines trade flows between two countries as well. This study, like DaSilva (2010), found size to be significant in explaining trade flows between Caricom countries and the US. For the purpose of this study, size was measured using per capita income. Like other studies on countries in Caricom, this variable was found to be statistically significant and negative (DaSilva, 2010). The interpretation here is that, as Caricom countries become richer, they will export less to the United States. The results indicate that a 1 percent increase in per-capita income will result in a 0.5 percent reduction of exports to the US. Intuitively, this makes sense. The results speak to the income elasticity of demand for exports. If Caricom citizens are becoming wealthier, their demand for goods and services will also increase. Therefore, firms that produce for these markets will more likely want to sell to their local consumers and not be bothered with the onerous task of exporting. With a wealthier domestic market, there is greater scope to sell outputs domestically. As such, as local consumers become wealthier, there will be a shift in selling strategy for firms as they will be more willing to service their domestic market than the export market.

## CONCLUDING THOUGHTS

Understanding the relationship between international standards for quality and international trade is important for policymakers in small, developing open economies. These economies are heavily dependent on international trade to drive economic growth. While the small size of these economies make them heavily dependent on exports as a way to grow their firms and economic sectors, the imposition of international standards by powerful developed countries are always seen as negative towards exporting from developing countries. The empirical evidence to support or disprove this claim is still limited. The research in this paper has sought to fill this gap by focusing on the relationship between international standards and exporting from the developing economies in Caricom to a large developed economy, the United States. The results indicate that it is not international standards that are most important in determining trade relations between Caricom countries and the United States, but it is the size of the economy as measured by per capita income and the proximity to market, as measured by distance. It is these factors that have emerged as statistically significant in the augmented gravity model that was estimated to test the relationship between international standards and international trade between Caricom and the United States.

In other words, the results from this analysis suggest that the cost to acquire international standards has to be treated as a sunk cost in small, developing economies that are looking to sell their goods and services on the world market. With these costs being exorbitant in most cases, some small economies find it very difficult to achieve international standards of quality in their production of goods and services for the export market. These issues sometimes raise tension in the political economy as most small nations see the imposition of international standards as not merely an economic matter but a political one as well. So, besides economic implications, there are political implications that small countries have to contend with as it relates to the imposition of international standards of quality on their exports to developed countries. In some cases, these standards make it difficult for firms to sell their products overseas and so local

political leaders have to deal with the fall-out from this dislocation. This is not an effortless task, especially in a context where exports are critical for the growth of these small, open economies.

While the findings are robust, the results should be taken as descriptive not prescriptive given the limitations in the data. The study was exploratory in nature. The model merely looked at whether or not a country has signed up for an international standard that is, ISO or HACCP. While this is indicative of the adherence to the standard, this classification is not sufficient to determine the full impact of the standards on exports. More nuanced data such as the number of certifications for each standard would give a better picture of the diffusion of the standards. However, the lack of such granular data for Caricom made it difficult for this analysis to be done. Also, other variables which impact trade such as the state of a country's infrastructure could have been included in the model. Again, the lack of data for most Caricom countries on the index of infrastructure developed by the World Bank, made it difficult to include these variables in the analysis. Despite these limitations, the results from this model are quite instructive.

## REFERENCES

- Beckford, G. (1983). *Persistent poverty: Underdevelopment in plantation economy of the third world*. London: Zed Books.
- Bernal, R. (2006). Nano firms, regional integration and international competitiveness: The experience and dilemma of the CSME. In Hall, K. and Benn, D. (Eds.), *Production integration in the Caribbean: From theory to action* (pp. 90-115). Jamaica: Ian Randle.
- Bénézech, D., Lambert, G., Lanoux, B., Lerch, C., and Loos-Baroin, J. (2001). Completion of knowledge codification: An illustration through the ISO 9000 standards implementation process. *Research Policy*, 30, 1395-1407.
- Clougherty, J.A., and Grajek, M. (2009). *International standards and international trade: Empirical evidence from ISO 9000 diffusion*. ESTM Working paper. JEL Code F13, L15, C51, 1-42.
- Czubala, W., Shepherd, B., and Wilson, J.S. (2007). Help or hindrance? The impact of harmonized standards on African exports. *Policy Research Working Papers*, No. 4400, Washington, DC: World Bank.
- DaSilva, D.A. (2010, March). *Impact of US HAACP regulation on export of fish and fishery products from Guyana*. Paper presented at the 7<sup>th</sup> Quest for Global Competitiveness Conference, San Juan, Puerto Rico.
- Deardorff, A.V., and Stern, R.M. (1998). *Measurement of nontariff barriers: Studies in international economics*. Ann Arbor, MI: University of Michigan Press.
- Egger, P., and Pfaffermayr, M. (2003). The proper panel econometric specification of the gravity equation: A three-way model with bilateral interaction-effects. *Empirical Economics*, 28, 571-580.
- Krugman, P. R., and Obstfeld, M. (2003). *International economics: Theory and policy* (6th ed.). Boston: Addison Wesley.
- Maskus, K. E., Wilson, J.S., and Otsuki, T. (2000). Quantifying the impact of technical barriers to trade: A framework for analysis. *World Bank Policy Research Working Paper* 2512.

- Moenius, J. (2006, May). *The good, the bad and the ambiguous: Standards and trade in agricultural products*. Paper presented at the International Agricultural Trade Research Consortium (IATRC) summer symposium. Food regulation and trade: Institutional framework, concepts of analysis and empirical evidence, Bonn, Germany.
- Moenius J. (2004). *Information versus product adaptation: The role of standards in trade, international business and markets research center*. Working Paper.
- Porter, M. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: The Free Press.
- Shepherd, B., and Wilson, J.S. (2007). *Trade facilitation in Southeast Asia: Measuring progress and assessing priorities*. Washington, DC: World Bank.
- Wilson, N.L.W., and Bray, V. (2010). *It happened all at once: switching regressions, gravity model and food safety*. Auburn: Auburn University.
- Wilson, J.S., and Otsuki, T. (2004). *To spray or not to spray: pesticides, banana exports, and food safety*. Washington, DC: Elsevier Ltd.
- Wint, A.G. (2003). *Competitiveness in small developing economies: Insights from the Caribbean*. Kingston: UWI Press.