“The impact of official development assistance on import capacity in Guyana (1960-2002)”

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The impact of official development assistance on import capacity in Guyana (1960-2002)

Abstract

The main finding of this study is that official development assistance supported sustainability of import capacity while aid as a percent of gross capital formation hindered it in Guyana over the period of 1960-2002. The paper utilized the bounds test for co-integration in the ARDL framework to identify the shortrun and long-run information in the model. The elasticities with respect to official development assistance and aid as a percent of gross capital formation are the principal determinants of aggregate import for Guyana in both the short-run and longrun. The study presents a greater understanding of the import capaity and the impact of institutions in the generation of foreign exchange. The authors recommend that leaders in both develop and developing countries harmonize policy on coherence, coordination and cooperation for allocation and disbursement of ODA in developing countries to improve its effectiveness. The superior performance of the new variables suggests further research can improve our understanding of import capacity in developing countries.

Keywords: official development assistance, import capacity, co-integration, Guyana.
JEL Classification: O11, O54, F34.

Introduction

Since the early 1960s both scholars and policy makers alike have shown great interest in the relationship between foreign exchange generation capabilities, capital formation and import capacity in developing countries. The motivation is clear. The capacity to import is considered crucial to capital formation, which is important to sustainable development in these countries. Developing countries were considered incapable of meeting adequate capital formation levels because saving ratios did not match level for rapid capital growth. The scenario painted suggests that economic development in these countries is impeded by low levels of national wealth creation and domestic ownership of capital employed in the production of goods and services (Neher, 1971). As a result, the country converges rapidly into the state of a perpetual international debtor. Further, it was recognized that industrial countries have a responsibility to assist developing countries (UNCTAD, 1964) in their pursuit of economic development. With a view to avert this scenario, industrial countries pledged individually to provide foreign aid at a level of 0.7 % of their annual gross national income (UNCTAD, ibid) and reiterated and reconfirmed their commitment at the 2002 Monterrey Summit[1] (Gupta, Pattillo, and Wagh, 2006).

Indeed favourable disbursement of foreign aid is known to follow the practice of good governance and adequate diplomacy in developing countries yet the effectiveness of the aid on development is questioned. Within the framework of international social and economic cooperation relationships, bilateral and multilateral institutions channel official development assistance (ODA) as foreign aid – aid other than disaster assistance. These institutions, including of International Monetary Fund (IMF), The World Bank Group (WBG), agencies of the United Nations, ministries and agencies of wealthy national governments, as well as private organizations and NGOs, exercise control over foreign exchange allocation and distribution to developing countries. Even as ODA generated negative externalities, it permitted them to facilitate the policy objectives of rich industrialized countries using resources availability and allocation to developing countries as a tool of influence on behavioral outcomes of specified countries (Gilpin, 1987). This fact suggests that the objective of supplementing capital import and development needs of developing countries with foreign aid may be compromised on a case-by-case basis. It is known that preferential biases of influential members are leverage to meet needs of bilateral, multilateral, NGO and other special private interest. Thus the impact of ODA in meeting the import needs of developing countries must be assessed on the case-by-case basis to identify the effectiveness of its impact on developing countries (Gupta et al., 2006).

An assessment of effectiveness may be gleaned from short review of the policy, structure, disbursement and assessment of nations ODA as presented by the study of Canadian ODA over the period from 1950 to 2002 (Schmitz, Pistor, and Furi, 2003). The general position of this study is that ODA was allocated and disbursed by Canada on basis of two distinct divisions – a partnership program including NGO, development banks, etc., inclusve of multilateral considerations and bilateral assistance, mainly government-to-government basis. In addition other

[1] The failures of DAC to meet the specified pledges of 1964 for development assistance and its consequential ineffectiveness to impact development adequately were discussed at the International Conference on Financing for Development (ICFD) was held in Monterrey, Mexico in March of 2002. Delegates agreed that increase development assistance is crucial to support the building of human capital, improving production and export capacities, and attracting private capital

supplementary channels for the allocation and disbursement of ODA included Department of Finance, Department of Foreign Affairs and International Trade (DFAIT), International Development Research Centre (IDRC), The International Centre for Human Rights and Democratic Development (ICHRDD) and Provincial Governments.

These myriad of structures and channels (bilateral, multilateral, commercial, private and NGO) facilitated the serving of self-interest to meet individual donor objectives and goals. In fact, by 1980 CIDA learnt that there was need for greater focus of allocation of ODA in human capital rather than large economic infrastructure project through projects in education, health, and people-to-people relationships (Schmitz et al., 2003). On basis of respecting the role of human capital the Canadian approached to ODA was shaped by a policy to respect "the right of others to choose their own path" and "emphasized social justice, participation", and "basic needs" (Schmitz et al., ibid). Thus given the general frustration with the effectiveness of ODA and "the March 2002 United Nations Conference on Financing for Development in Monterrey, Mexico," the Prime Minister of Canada pledged an annual commitment of 0.8% of Canada's GNI to ODA (Schmitz et al., ibid). This experience of Canada may be mirrored by other members of the Development Assistance Committee (DAC)[1] and serves to inform our expectation for the impact of ODA on imports capacity to be negative.

This paper examines the impact of ODA on import capacity in Guyana over the period from 1960 to 2002. This study serves to contribute to the literature as the first study undertaken in this regard; it gives empirical evidence to the performance of effectiveness of ODA to import demand; and presents a turning point to guide Guyana's approach and indeed that of other developing countries of like historical economic, political and socio-cultural experiences to support and follow the goals and objective for ODA formulated in Monterrey 2002. Although ODA and national income are collected and measured routinely in Guyana, their impacts on import capacity growth remain controversial. A central issue in this controversy is the extent to which the two "negative" concepts-official development assistance and national income-occurring through foreign exchange contribution to imports, generate negative externalities for Guyana. Additional concerns for this paper are size of ODA as a measure of foreign exchange and its impact on the supply of imports. Another question relates to the homogeneity of foreign exchange transmission channels. We solved this by measuring the impact of ODA in conjunction with other known foreign exchange generating variables in terms of foreign exchange elasticity – the measurement of the impact of a change in foreign exchange on aggregate imports, ceteris paribus.

Indeed aggregate import-demand functions have been estimated widely as aggregate-import demand functions. There are basically four variables (imports, income, price, and exchange rate) used in various forms in the traditional models to examine the related nexus (see Senhadji, 1998; Gafar, 1995; 1981; Wall, 1968). Foreign exchange availability was added by Moran (1989), Mwega (1993), Egwaikhide (1999), and Cheelo (2001). This study widens the import capacity-foreign exchange nexus beyond the considerations of import, income, price and exchange rates (mere market-oriented variables) and foreign exchange availability to include an understanding of the contribution to foreign exchange generation based on official actions.

The majority of the literature on import demand fails to consider official action in the generation of foreign exchange and the influence of conditionality imposed on allocation and distribution of foreign aid to particular developing countries as responses to current international political economy behavior/actions of potential recipients[2]. As such, our contribution considers the generation of foreign exchange through direct official actions as disbursement of official development assistance (DA), aid related to gross capital formation (AC) and the manipulation of fiscal and monetary policy to preserve and grow international reserves (IR). A positive relationship between these variables and import capacity is considered as important for the sustainability of economic development in keeping with UNCTAD (1964). However, given the concerns expressed at the Monterrey Conference 2002, and the findings of the Canadian review of ODA for the period of 1950-2002, it is expected that findings could be mixed for DA, AC and IR in developing countries.

Based on the traditional variables, empirical evidence suggests that the relationship between imports and the foreign exchange supply constraint is negative though significant (Moran, 1989; Mwega, 1993;

[1] There are 24 members of the DAC namely Australia, Austria, Belgium, Canada, Denmark, European Union, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States.

[2] It is a requirement that nations are subject to the influence of the major donors in their ability to receive and access aid. For example the potential recipient's foreign policy interests may have implications for how the France, China, Great Britain, Japan or the USA allocates aid bilaterally, multilaterally or in cooperation and collaboration amongst themselves. These may include action in uses of soft power tools inclusive of diplomacy (public, State military) and foreign assistance as well as global trade and investment, and sovereign wealth funds.

Egwaikhide, 1999; and Cheelo, 2001). As such the main purpose of this study is to determine the impact of official actions in the form of generation foreign exchange on import capacity. In this regard we include official development assistance (DA), in conjunction with, AC and IR and the set of traditional foreign exchange variables (national income, exports, exchange rate) in an aggregate import demand function for Guyana over the period of 1960-2002[1].

Numerous factors qualify Guyana as an appropriate case for examining the effects of official development assistance (DA) and growth of national income (NI) on import capacity (IM) in a developing country. Like developing countries foreign trade (inclusive of migrant remittances[2], sugar, rice, bauxite, forest products, gold and diamonds, finfish and shellfish, and non-traditional agriculture) is important to the Guyanese economy. Like other small and relatively open economies, the Guyanese economy faced difficult periods over 1960-2002 (see Figures 1(a) and 1(b)) mainly from episodes of world market collapse, soaring energy prices, and adverse international relation practices. In this latter episode the economic and development philosophy guided the leveraging of international influences in the allocation and disbursement of aid both DA and AC – seen mainly as technical cooperation[3]. Guyana maintained a socialist economic outlook as it aligned its economic and political outlook with the Soviet Union, Eastern-Bloc Countries, China and Cuba. Indeed Guyana would have difficulties of retaining or sustaining technical cooperation projects with market oriented economies[4] given (1) the domestic and global political ideological alignment of the four regimes (PPP, PNC-UF, PNC, and PPP-CIVIC) during this period; (2) the presence of strong ethnic tensions; and (3) the impact of fluctuations of global trade on the level and continuance of appropriate budgetary allocations and disbursement of donor countries. Further, known conflict existed between imported technology and integration in the domestic economy based on the relevance of technology that was hard to understand, too difficult to repair; resulting in dependency, corruption, and lack of integration with the local or indigenous economy. To understand the implications of these happenings for the Guyanese economy we must recognize as a subsystem of the capacity to import, the changing nature of foreign exchange generation, and the support or hindrance of foreign aid to growth and economic development. We view the scenario playing out on import capacity through the impact of the foreign exchange generation on aggregate imports-import demand.

We consider aggregate imports and development assistance to Guyana for two main reasons: (1) the recognition of the importance of imports flow for Guyana's transformation, growth, and development; and (2) the effectiveness of DA on import capacity and growth in Guyana a measurable positive impact. Indeed Guyana, a predominantly agricultural economy, is known to be constrained by limitations on its ability to generate foreign exchange given the vagaries of political relations of international trade. As such, the examination of the stability of aggregate imports in Guyana serves as a case-in-point for developing countries. The stability is depicted in Figure 1(a) and Figure 1(b).

Fig. 1(a). Imports as percentage of GDP

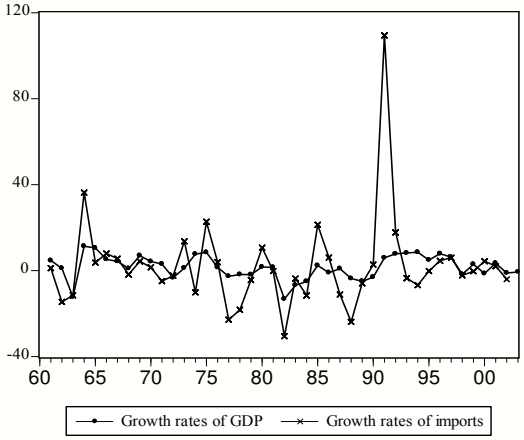

Fig. 1(b). Growth rates of GDP and growth rates of imports over the period of 1960-2002

[1] This period was chosen because of data availability issues and it coincided with the review of the effectiveness of ODA at the Monterrey 2000 Conference (UNCTAD, 2002).

[2] Whenever migrant remittances are reduced, negative externalities, contagion effects among the import demand functions, are present. Changes in the movements of migrant remittances and the impact of the shadow economy affect quantities of foreign exchange in related foreign exchange centres ("cambios"), banks and retailers.

[3] Technical cooperation in nature manifests the efforts of regional and multilateral organizations and bilateral donor agencies to support rapid transition of developing countries to becoming a competitive member in the globalization and trade liberalization process. In this regard there are three broad expected outcomes for technical cooperation in developing countries namely (1) they would participate in international standardization, (2) have enhanced capacity building capabilities, and (3) participate effectively at the regional and international level.

[4] Research revealed that an important number of projects in Guyana undertaken under the ambit of technical cooperation in Guyana were unsustainable because of timely disbursement and availability of matching funds, inability of economy to absorb the supply of new resources and infrastructure, and large scale migration of human capital and importantly withdrawal of continued funding support especially on the bilateral channels (Butts, 2006).

We observe in 1960 that Guyana's aggregate imports represented about 56% of its GDP. Then, through the decades of the 1960s, 1970s, 1980s, and 1990s, respectively, aggregate imports fluctuated widely in term of its relation to GDP (Figure 1(a)) and its annual growth (Figure 1(b)). Imports as a percentage of GDP averaged 55, 68, 73, and 107% for the 1960s, 1970s, 1980s, and 1990s, respectively. Guyana experienced 22 negative episodes of growth and 20 positive episodes of growth with six episodes greater than 10%. The real sector also experienced wide episodes of contraction and expansion over the 43 years period.

Given Guyana's vulnerability as an open economy, both export and import price shocks are passed through to its economy largely with negative macroeconomic outcomes. As such, macroeconomic inadequacies attracted the involvement of international actors (private sector, governments and international institutions as well as non-governmental organizations) in the affairs of Guyana. The intended involvement was aimed to remedy the macroeconomic inadequacies, facilitate the workings of market forces, and overcome foreign exchange shortage. However, the nature of Guyana's economy suggests stagnation of production and productivity, volatile economic and political climate, and poor governance for most of the period. The nature of the outcomes suggests that foreign aid (foreign involvement) had a negative impact on import capacity.

Given the backdrop above, the purpose of this paper is achieved by utilizing autoregressive distributive lag (ARDL) co-integration and error-correction methodology (ECM) under the elasticity approach. Co-integration analysis will indicate whether there are long-run relationships between the variables. The error-correction model will analyze short-term dynamics in regard to the speed of the adjustment of their deviations to long-run equilibrium. The determination of co-integration in the context of Guyana is germane since time series for Guyana are known to be non-stationary, integrated to order one, I(1), in levels, but first-differenced stationary, I(0) (Butts, 2009; Butts, 2006; Modeste and Butts, 2003), or even as much as I(1), I(2) or I(3) (Egoume-Bassogo, 2000).

The paper is organized as follows. Section 1 deals with the theoretical framework and model development to link Guyana's import performance to changes in the behavior of official development assistance, national income and other foreign exchange generating variables. Section 2 addresses the proposed method of analysis and the collection of data. Section 3 covers econometric analysis and results. It presents the empirical results derived from estimating growth-in-imports equations. The final section presents the summary, discussions and recommendations.

1. Theoretical framework and model development

1.1. Theoretical. By reviewing previous studies the conventional view contains predictions of aggregate import demand based on changes of autonomous imports, national income, relative prices and exchange rates for open economies (Abbott and Vita, 2003). Like neoclassical modelling, they assume market conditions, inclusive of appropriate institutions, are in place to facilitate policy-oriented actions (Santos-Paulino, 2002; Senhadji, 1998; Price and Thornblade, 1972). Indeed, we note this deficiency in the case of Guyana and reiterate the importance of measuring the transmitted influences of the macroeconomicinadequacies and concomitant attention of international actors on its import capacity.

The inclusion of official development assistance (DA)[1], aid as percentage of gross capital formation (AC), exportascapacity to import (XC), and international reserves (IR), serves to augment the traditional import model with policy variables. It also serves to capture the direct influences of the major foreign exchange earner – exports. In addition, it represents local and international official influences on import capacity through the foreign exchange they generated. Finally, it brings us into a general equilibrium framework.

The perceived role of these variables is postulated as follow. First, DA provides an outcome of political economy theory for meeting the "target rate" for ODA (UNCTAD, 1964). As a result foreign exchange generation from international institutions and agencies is expected to boost import capacity. International institutions reiterated commitment (UNCTAD, 2002) to the provision of foreign aid inclusive of economic, humanitarian and disaster relief (Djankov et al., 2006; Razafimahefa et al., 2005). In addition, debt "write-offs" to developing countries and concessionary loans to bridge investment and financial needs are supported by the WBG (World Bank, 2006). We expect the influence of DA on aggregate import demand (IM) to be positive and significant on the assumption that it augments domestic income, facilitates transitory consumption, and does not crowd out private investment[2].

[1] ODA is complex. Accordingly we consider an example of the OECD credit reporting system that comprises three main types of aid – Investment project, Sector program, Technical cooperation as well as combinations of these. These are further classified according to earmarked at source (free-standing technical cooperation, emergency assistance, including food aid (EA), and global program funds) and non-earmarked at source (general budget support, sector program support, debt relief and actions relating to debt).

[2] This is plausible since foreign exchange allocations outside of natural disasters and allocated after "careful" assessment of needs and "confident" projection of likely impact

Second, AC provides within the official development-assistance-country package an important quality (capital formation (both human and physical) through technical assistance) to the association between domestic and international policy-making institutions. For illustration, ODA to Guyana ranged from a low of 11.64 % to a high of 99.7% between 1960 and 2002. Except for 1997 (11.64%), Guyana depended almost totally on official development assistance to boost gross capital formation and the highs and lows could reflect more of the international relations of its political economy. It comprised bilateral (approximately 45% of aid for 1960-2002), multilateral (approximately 52%) and private donors or contributors. From a diagnostic perspective, for example, the findings of the Canadian review of ODA (2003) and the Government's policy to realign the ODA away from large projects to people-to-people projects could be aligned to the difficulties of developing countries and indeed Guyana experienced. Indeed Guyana would have had difficulties of retaining or sustaining technical cooperation (assistance) projects[1] given nature of the domestic and global political ideological alignment during this period. This suggests an adverse effect on local production overtime as technical cooperation, the main element of AC failed to activate local assets and stimulate economic growth. We expect the influence of the share-of-aid in gross capital formation (AC) to be negative and significant on the aggregate import demand (IM).

Third, international reserve (IR) establishes safeguards against the impact of financial crises on the level of aggregate import relative to levels of performance of exports (Esfahani, 1991; Chow, 1987). It is boosted by superior performance of exports, contributions of international agencies, and both the preventive and precautionary measures of governments to conserve (boost) foreign exchange as well as migrant remittances[2]. Given the volatility of growth observed in Figure 1(b), we expect the influence of international reserves to be negative and significant on aggregate import demand in Guyana.

Lastly, export earnings capacity (XC) is the main proportion in the foreign exchange portfolio. The supply of exports is an implicit function of imports (Clark and Marois, 1996). The portions of export earnings transferred to creditors are known to minimize the pressure of the debt burden on developing countries, but dampen simultaneously the contribution of exports to imports and economic growth (Butts, 2006; Modeste and Butts, 2003; Al-Yousif, 1999; Clark and Marois, 1996; Krugman, 1988). The relationship between exports and imports is controlled using normalized data that pit exports with respect to the import price index and therefore terms-of-trade considerations and measures the capacity of exports to import (WDI, 2007). We expect the impact of export-as-capacity to import on aggregate import demand to be positive and statistically significant.

1.2. Model. This study combines related external linkages, generators of foreign exchange, to include both market and non-market forces. An aggregate import variables relationship for Guyana is hypothesized within the general equilibrium framework, and presented in a model of within the aggregate production framework as follow:

$$IM = f(NI, XC, XR, IR, DA, AC), \quad (1)$$

where IM are the aggregate imports, NI is the income, XC is the measure of export, XR is the exchange rate, IR is the measure of foreign reserve, DA is the measure of official development assistance, and AC is the measure of aid in the form of capital. When equation (1) is converted into its growth form and the conventions are applied for logarithm in lower case letters the following equation is obtained.

$$m_t = \alpha_0 + \alpha_1 ni_t + \alpha_2 xc_t + \alpha_3 xr_t + \alpha_4 ir_t + \\ + \alpha_5 da_t + \alpha_6 ac_t + \varepsilon_t, \quad (2)$$

where, t is time in years, m_t are the gross imports, ni_t is the gross national income, xc_t is the exports-as-capacity to import, xr_t is the official exchange rate, $ir_t$is the total foreign reserves, da_t is the official development assistance, and ac_t is the aid asapercentage of gross capital formation; ε_t is the error term, and α_1, α_2, α_3, α_4, α_5, and α_6 are the elasticities to be estimated.

2. Data and methodology

2.1. Data. Annual national accounting data from World Development Indicators, CD-ROM 2007, of the World Bank Group are used for aggregate imports (IM), gross national income (NI), exports-as-capacity-to-import (XC), official exchange rate (XR), and international reserves (IR), official development assistance (DA), and aidaspercentof gross capital formation (AC), over the period from 1960 to 2002 (43 observations) queried for Guyana. All variables are expressed in natural logarithm. Estimation of the coefficients of the variables in the equations, and identification and diagnostic tests were carried.

[1] Research revealed that an important number of projects in Guyana undertaken under the ambit of technical cooperation in Guyana were unsustainable because of timely disbursement and availability of matching funds, inability of economy to absorb the supply of new resources and infrastructure, and large scale migration of human capital and importantly withdrawal of continued funding support especially on the bilateral channels (Butts, 2006).

[2] Migrant remittances have assumed the number one position of foreign exchange inflows in Guyana. Thus, a minor reduction in remittance inflows can have significant negative impacts on over international reserves availability. We consider this a fertile area for future research.

2.2. Methodology. The methodology uses the auto-regressive distributed lag (ARDL) framework approach developed by Pesaran, Shin, and Smith (2001). The approach does not require pretesting variables in the levels to determine the order of integration. Also, it has several small sample econometric advantages over other procedures including robust results for small sample estimations, super-consistent long-run coefficients (Duasa, 2007), simultaneous testing for both short-run and long-run relationships – thereby removing problems associated with omitted variables and autocorrelation; and distinguishing between dependent and independent variables (Pesaran et al., 2001). Consequently, we use the Pesaran et al. (2001) ARDL approach to analyze simultaneously how the short-run behavior of variables is related to the long-run equilibrium between them. Accordingly, the conditional error correction (EC) regression for aggregate import demand and its determinants is written as follow:

$$m_t = b_0 + \delta_1 m_{t-1} + \delta_2 ni_{t-1} + \delta_3 xc_{t-1} + \delta_4 xr_{t-1} + \delta_5 ir_{t-1} + \delta_6 da_{t-1} + \delta_7 ac_{t-1} + \varphi dum_t +$$
$$+ \sum_{i=1}^{n} \beta_i \Delta m_{t-i} + \sum_{i=t}^{n} \lambda_i \Delta ni_{t-i} + \sum_{i=1}^{n} \Delta \varpi_i xc_{t-i} + \sum_{i=1}^{n} \psi_i xr_{t-i} + \sum_{i=1}^{n} \theta_i \Delta ir_{t-i} + \sum_{i=1}^{n} \eta_i \Delta da_{t-i} + \sum_{i=1}^{n} \omega_i \Delta ac_{t-i} + \varepsilon_t, \quad (2)$$

where Δ denotes the first difference operator, n is the optimal lag length, *dum* is a dummy variable that augments equation (1) and measures the transient effects of the structural adjustment program that was implemented in Guyana. The period of 1988-1991, the point of the financial crisis, is valued as 1; the periods before 1988 and after 1991 are valued as 0. Testing for any long-run relationship amongst the variables is based on the bounds testing procedure (Pesaran et al., 2001).

There are basically three stages for completing the bounds testing procedure. There are: (1) the determination of long-run relationship; (2) the estimation of the long run; and (3) the estimation of the error correction model. We include a pre-phase to deal with a concern for stationarity. Thus, we test for unit root of the series to determine if they are $I(0)$, $I(1)$ or higher, since if the series are $I(2)$ or higher the ARDL is not applicable.

Stage 1. We estimate unrestricted error-correction (EC) regressions to determine the direction of the long-run relationship, if any. Accordingly, each variable (*IM*, *NI*, *XI*, *XR*, *IR*, *DA*, and *AC)* is considered in turn to be normalized as the independent variable in variants of equation (2) using ordinary least squares (OLS) (Narayan, 2004). This gives seven possible EC regressions. To determine the long-run relationship bounds tests are performed using an F-test on the null hypothesis of no co-integration between the lagged level variables. For no co-integration among the variables in equation (2), we normalized for *IM*, and state the null hypothesis as:

H_0: $\delta_{1IM} = \delta_{2IM} = \delta_{3IM} = \delta_{4IM} = \delta_{5IM} = \delta_{6IM} = \delta_{7IM} = 0$

against the alternative hypothesis.

H_A: $\delta_{1IM} \neq \delta_{2IM} \neq \delta_{3IM} \neq \delta_{4IM} \neq \delta_{5IM} \neq \delta_{6IM} \neq \delta_{7IM} \neq 0$.

This also can be denoted as F_{IM}(*IM*, *NI*, *XC*, *XR*, *IR*, *DA*, *AC*). The same approach is taken for other normalized variables *NI*, *XC*, *XR*, *IR*, *DA* and *AC*, respectively.

Given the computed Wald F-statistics in this procedure cannot be used because there are known to be non-standard distribution (Stock and Watson, 2003), we use specific asymptotic critical-values bounds as in Table CI (3) of Pesaran et al. (2001, p. 303), and/or Case II of Nayaran (2004, p. 1988) to determine one of three possible outcomes – no long-run ($I(1)$, long-run $I(0)$ or inconclusive, respectively (Pesaran et al., 2001). Because the critical values generated by Pesaran et al. (2001) are known to underestimate the critical values for small samples (Narayan, 2004), we use those values generated by Narayan (2004). If the F-statistic exceeds the upper-bound critical values we conclude that there is a long-run relationship among the variables and consider moving to stage 2.

Stage 2. We estimate the long-run (co-integration) relationship(s) from the normalized restricted conditional ARDL long-run model denoted as the lagged levels as follows:

$$m_t = b_0 + \sum_{i=0}^{n} \delta_1 m_{t-1} + \sum_{i=0}^{n} \delta_2 ni_{t-i} + \sum_{i=0}^{n} \delta_3 xc_{t-i} + \sum_{i=0}^{n} \delta_4 xr_{t-i} + \sum_{i=0}^{n} \delta_5 ir_{t-i} + \sum_{i=0}^{n} \delta_6 da_{t-i} +$$
$$+ \sum_{i=0}^{n} \delta_7 ac_{t-i} + \varphi dum_t + \varepsilon_t. \quad (3)$$

The lag is selected using "model selection" based on the Akaike Information Criterion and Final Prediction Error criteria, which are superior to other criteria (Liew, 2004). Pesaran et al. (2001) recommended a maximum of 2 lags to be chosen for annual data.

Stage 3. We construct the error-correction model (ECM) to determine the specification for the short-run dynamics which is estimated on identification of the optimum lag length of the variables. In this regard, we form an ECM as follows:

$$\Delta m_t = \beta_0 + \varphi ect_{t-1} + \sum_{i=1}^{n} \beta_i \Delta m_{t-i} + \sum_{i=1}^{n} \lambda_i \Delta ni_{t-i} + \sum_{i=1}^{n} \varpi_i \beta_i \Delta xc_{t-1} + \sum_{i=1}^{n} \psi_i \Delta xr_{t-i} + \sum_{i=1}^{n} \theta_i \Delta ir_{t-i} + \\ + \sum_{i=1}^{n} \eta_i \Delta da_{t-1} + \sum_{i=1}^{n} \omega_i \Delta ac_{t-1} + \varepsilon_t \quad (4)$$

where β_0 is the unrestricted intercept, φ, is the speed of adjustment parameter and ect_{t-1} is the error-correction term; ε_t is a serially uncorrelated disturbance term. Equation (4) describes an aggregate import-growth-led function that incorporates the short-run disturbance with coefficientsβ, λ, φ, ψ, θ, η, and ω, respectively, into the adjustment process whereby the model returns to equilibrium. The presence of ect_{t-1} guarantees the long-run relationship amongst the variables is taken into account. It reconciles the shortrun with the longrun and ensures stability in the presence of the short-term dynamics. Also, it facilitates the application of the fundamental elements of the Granger-causality tests. The determination of causality is facilitated from two perspectives of the estimated coefficients. First, we interpret the evidence as long-run causality if φ is negative and significant ($\varphi < 0$) using the t-test (Bahamani-Oskooee and Ratha, 2003). Second, we infer short-run causality from the evidence if the calculated F-statistic, which is based on the standard test for joint null hypothesis of lags of each explanatory variable ($\beta_i = \lambda_i = \varphi_i = \psi_i = \theta_i = \eta_i = \omega i = 0$) is rejected. If such, *IM*, *NI*, *XC*, *XR*, *IR*, *DA* and *AC* can anticipate or forecast import capacity for Guyana. The error term, *ect*, is derived as the residual from the estimated long-run model for m_t in equation (2). We ascertain the goodness of fit of the ARDL model with diagnostic and stability tests. For the purpose of diagnostic, normality and serial correlation tests are used. For stability the Reset test for specification and the CUSUM test for structural stability are used.

3. Results and interpretation

The data are described in Tables 1 and 2. Table 1 reports descriptive statistics. The variables overall do not show substantive change over the period-standard deviation is < 1, except for international reserves. The latter variable is known to be instrumental to the terms suppliers offer for financing imports. However, it is not extreme since it is within 2 standard deviations. We cannot rule out normality for the variables except for IM_t, and XC_t, which are skewed highly. Likewise they are mesokurtic, i.e., kurtosis > 3 indicating annual performances are extreme from their respective means-which suggests that the distribution of observations is influenced by extreme values (shocks to the supply of foreign exchange).

Table 1. Summary of descriptive statistics

	IM_t	NI_t	XC_t	XR_t	AC_t	IR_t	DA_t
Mean	22.40	22.23	22.30	-2.12	3.33	15.26	15.05
Median	22.52	22.28	22.42	-2.22	3.32	15.05	14.90
Maximum	22.82	22.81	22.78	-1.63	4.91	17.11	16.89
Minimum	21.69	21.64	21.48	-2.49	1.83	12.90	13.55
Std. dev.	0.28	0.26	0.327	0.29	0.70	1.29	0.845
Skewness	-1.05	-0.35	-1.085	0.40	0.13	0.04	0.342
Kurtosis	3.16	2.62	3.077	1.56	2.54	1.90	2.200

Table 2 reports that IM_t is correlated highly with the NI_t and IR_t at the nominal 5% level of significance. The positive relationships between IM_t and NI_t, XC_t, IR_t and DA_t imply that import capa-city increases with growth in gross national income, exports-as-capacity to import (favorable terms of trade), international reserves (positive shocks to the supply of foreign exchange), and favorable exchange rates, respectively, in Guyana. However, an increase in aid as a percent of gross capital formation leads to a decrease in import demand. The highest correlation, 0.91, is with, XC_t but does this suggest causation? Correlation does not mean causation and we shall see how this fans out in the presence of other variables.

Table 2. Correlation matrix

	IM_t	NI_t`	XC_t	XR_t	AC_t	IR_t	DA_t
IM_t	1.00						
NI_t	0.76	1.00					
XC_t	0.91	0.75	1.00				
XR_t	0.17	-0.05	0.36	1.00			
AC_t	-0.12	-0.27	-0.16	-0.45	1.00		

Table 2 (cont.). Correlation matrix

	IM_t	NI_t`	XC_t	XR_t	AC_t	IR_t	DA_t
IR_t	0.67	0.43	0.65	-0.17	0.45	1.00	
DA_t	0.04	-0.11	-0.11	-0.65	0.91	0.51	1.00

Note: *Computed at the 5% significance level.

We pretest the variables for univariate integration. This is justified from an examination of line graphs (not presented here) in which the presence of structural breaks and diverse levels of integration are observable. Thus we use the Augmented Dickey Fuller (ADF) and the Phillip-Perron (P-P) tests to investigate series for unit root. The results of the unit root tests as recorded in Table 3 show that all the variables are non-stationary in levels, but are first-differenced stationary. Thus, the regressors are I(1) and therefore auto-regressive. The examination of the long-run relationship is pursued as suggested by Pesaran et al., (2001) and Narayan (2004) for annual data. We chose 3 as the maximum order of lags; and based on the Akaike Information Criterion (AIC) a lag of 1 was chosen.

Table 3. Unit root tests

Variables	ADF with intercept		Phillips-Perron with intercept	
	Level	First difference	Level	First difference
IM_t	-1.88	-5.29*	-2.00	-6.40*
NI_t	-1.90	-5.06*	-1.82	-5.03*
XC_t	-1.70	-5.50*	-1.79	-5.45*
XR_t	-1.50	-7.83*	-1.40	-8.07*
AC_t	-1.99	-6.44*	-2.04	-6.44*
IR_t	-1.12	-6.66*	-1.19	-6.66*
DA_t	-1.71	-6.17*	-1.74	-6.17*

Note: *Significant at the 1% level.

The computed F-tests for the joint significance of the lagged levels of variables in equation (2) are recorded in Table 4. There is strong evidence for co-integration because the computed F-statistic is 4.3910, which is greater than the critical value of the upper-limit of the bound (Narayan, 2004) at the 5% level of significance for import demand. ARDL is applicable. Thus, there is a long-run relationship between *IM*, and the independent variables *NI*, *XC*, *XR*, *IR*, *DA* and *AC* to which the variables responded in the short-run in Guyana. Similarly, there is evidence of co-integration (F-statistic is 6.3312) at the 1 percent level of significance for the exports-as-capacity to import (XC). However, since our primary interest is in the hypotheses of co-integration with respect to import demand, exports-as-capacity to import will not be our focus.

Table 4. F-statistic of co-integration relationship

Normalized variable	F-statistic	Probability
IM	4.3910	0.0027**
NI	2.7286	0.0301
XC	6.3312	0.0002*
XR	1.1650	0.3572
IR	1.7717	0.1518
DA	1.5466	0.1976
AC	1.6125	0.1779
Critical value	Bounds critical values Narayan (2004) K-7	
Significance level	Lower bound	Upper bound
1 percent	3.388	4.832
5 percent	2.504	3.723
10 percent	2.131	3.223

Notes: Critical value are obtained from Narayan's (2004, p. 1988) Table Case III, unrestricted intercept and no trend. * and ** indicate significance at the 1% and 5% levels, respectively.

Table 5 presents the results of the estimates of long-run elasticities for equation (2). The independent variables satisfy expectations. They are, except *dum*, significant at least at the 10% level of significance. In the long-run *NI*, *XC*, *XR*, and *DA*, respectively, has a positive and significant effect on *IM*. On the other hand, *AC* has a negative and significant effect, which supports the expectation for *AC*. The effects of government crisis policies, *dum*, in Guyana are important, given $t > 1$. They have the tendency to reduce import capacity, but boost (higher *t*-statistics) the contribution of the other determinants as their absence suggest in the estimation without *dum*.

Table 5. Estimation of long-run elasticities

Dependent variable	Independent variables						
	NI_t	XC_t	XR_t	IR_t	DA_t	AC_t	DUM_t
IM_{tdum}	0.19 (1.65)***	0.42 (2.76)**	0.31 (2.78)**	0.04 (1.73)***	0.35 (6.74)*	-0.34 (-6.50)*	-0.08 (-1.40)
IM_t	0.18 (1.61)	0.49 (3.45)*	0.26 (2.42)**	0.03 (1.33)	0.33 (6.43)*	-033 (-6.30)*	–

Note: Standard error in parentheses. *, ** and*** significant at the 1% level, 5% and 10% level, respectively

With a view to get deeper insights of the long-run relationship between the variables and aggregate import demand we conducted a stepwise regression along the model of equation (1) beginning with national income, NI_t. The results are summarized in Table 6. We observe that official development assistance (DA_t), international reserves, (IR_t) and official exchange (XR_t) carried the right signs but were insignificant until aid as a percentage of gross capital formation (technical assistance), AC_t, were included. All became significant at least at the 10 percent significant level in the case of international reserve. Notably, AC_t made the biggest contribution in explain aggregate import demand-R-squared increased by about 6 percent. The inclusion of dum_t reduced the impact of all and made IR_t once again insignificant.

The results of diagnostic tests on the residuals present no evidence of serial correlation, heteroskedasticity or parameter instability in the model. The residuals satisfied the Jarque-Bera normality; and stability was present as indicated by the CUSUM test for structural stability. On this basis, in the long-run *XC*, *XR*, *DA* and *AC* are determinants of import capacity in Guyana. For example if *DA* increases by 1 percent, *ceteris paribus*, then import capacity *IM* will change by 0.335 percent.

Table 6. Stepwise regression for long-run elasticities

Dependent variable: IM_t					
C	1.522 (1.206)	3.022 (1.764)	1.418 (0.702)	3.360 (2.43)**	4.60 (2.54)**
NI_t	0.3451 (2.893)*	0.422 (3.1815)*	0.436 (3.321)*	0.3657 (4.139)*	0.181 (1.576)
XC_t	0.666 (7.878)*	0.529 (3.888)*	0.580 (4.183)*	0.416 (4.345)*	0.439 (3.01)*
XR_t	0.0163 (0.186)	0.119 (1.010)	0.1710 (1.402)	0.387 (4.416)*	0.29 (2.72)**
IR_t	–	0.028 (1.282)	0.005 (0.195)	0.037 (1.99)	0.036 (1.601)
DA_t	–	–	0.0460 (1.449)	0.309 (7.025)*	0.343 (6.66)*
AC_t	–	–	–	-0.315 (6.829)*	-0.335 (6.34)*
dum					-0.087 (-1.61)
Diagnostics					
R-squared	0.887	0.8918	0.8976	0.9554	0.9429
Adjusted R-squared	0.878	0.8804	0.8838	0.9480	0.9314
F-statistic	102.249 (0.000)	78.364 (0.0000)	64.928 (0.0000)	128.617 (0.0000)	82.575 (0.000)
DW	1.3268	1.3994	1.3306	1.808	1.7674
Jarque-Bera normality	0.560 (0.755)	0.3683 (0.8322)	0.3457 (0.8412)	3.7125 (0.1562)	0.9462 (0.62)
Serial Correlation LM test	4.82 (0.013)	4.3078 (0.0210)	4.427 (0.0193)	0.1426 (0.8675)	0.3271 (0.7232)

Table 6. (cont.) Stepwise regression for long-run elasticities

Diagnostics					
Arch test	5.178 (0.0006)	3.6627 (0.0035)	1.8013 (0.10078)	1.400 (0.2195)	0.0046 (0.9461)
Stationary	-4.666 (4 0.005)	-4.765 (0.0004)	-4.645 (0.0005)	-5.757 (0.000)	-5.6121 (000)

Note for the coefficients *, **, and *** represent 1% 5% and 10% significance level respectively. Likewise t-statistic is in parenthesis.

The results of the short-run elasticity estimate for *IM*, *NI*, *XC*, and *XR*, respectively, as presented in Table 7, suggest they are not significant. While the elasticities for income and exchange rate are positive, that for export is negative. The short-run elasticity estimates for *IR*, *DA* and *AC* are highly significant. *AC* has maintained a negative relationship with aggregate imports demand. In the shortrun, changes in the elasticities of *IR*, *DA*, and *AC* preceded growth in import capacity. Notably, *IR* has greater significance in the shortrun. It is positive and significant at the 1 percent level. We can anticipate that if the growth rate of *IR* changes by one percent, *ceteris paribus*, then import capacity will increase by a rate of 0.1366 percent. The coefficient of ECT_{t-1} is negative and significant at the 1 percent level of significance. In relation to *AC* and *DA* given our interest in ODA we venture the initial interpretation of these performances as indicating the ability of ODA in the form of DA to sustain development in Guyana in general, while it suggests an inability to do so for the technical cooperation aspect.

Table 7. Estimation results for short-run elasticities/causality test

Variables	Coefficient
Intercept	-0.01 (-0.61)
ΔIM_{t-1}	0.32 (1.31)
ΔNI_{t-1}	0.15 (0.62)
ΔXC_{t-1}	-0.03 (-0.14)
ΔXR_{t-1}	-0.15 (-0.81)
ΔIR_{t-1}	0.13 (3.23)*
ΔDA_{t-1}	0.46 (3.87)*
ΔAC_{t-1}	-0.49 (-3.99)*
ECT_{t-1}	-1.07 (-4.65)*
Diagnostics tests	
Jarque-Bera normality	0.054 (0.97)
Breusch-Godfrey Serial Correlation LM test	0.002 (0.99)
ARCH test	0.351 (0.33)
Ramsey Reset	2.753 (0.10)
R-squared	0.65

Notes: The numbers in parenthesis are t-statistic. * Significant at the 1% level.

We interpret this evidence as long-run causality whereby *NI*, *XC*, *XR*, *IR*, *DA*, and *AC* indirect Granger-caused *IM*. The direction of causality runs interactively via *ECT* from *NI*, *XC*, *XR*, *IR*, *DA*, and *AC* to *IM*. The significance of ect_{t-1} suggests that deviations were corrected within the next period (within a year) whenever *IM* overshot its long-run equilibrium path.

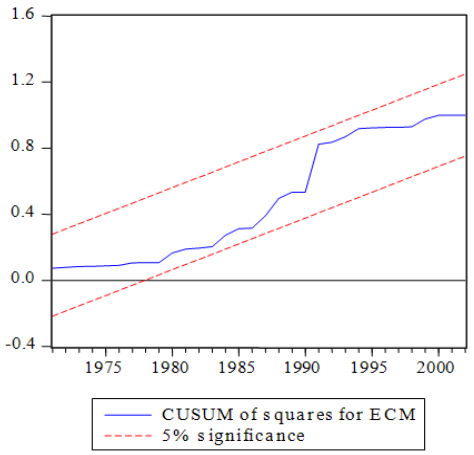

Fig. 3. CUSUM of squares for ECM

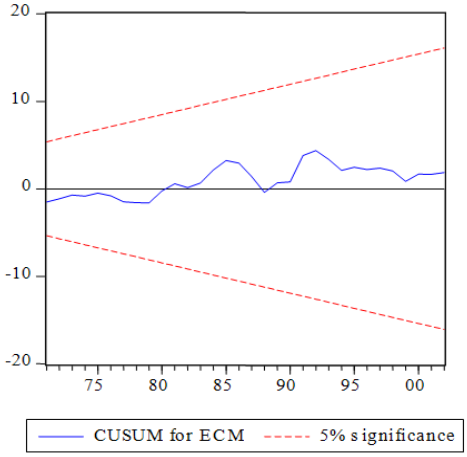

Fig. 4. CUSUM for ECM

As reported in Table 8, the short-run model, like the long-run model, satisfies the rigor of a series of diagnostic and stability tests on the residuals. There is no evidence of abnormality, serial correlation, heteroskedasticity, or parameter instability. The Jarque-Bera normality test suggests that the errors are distributed normally. They approximate white noise (Breusch-Godfrey Serial Correlation LM test), have no autocorrelation (ARCH test) and possess stability in the parameters. Both models satisfy the CUSUM tests for recursive estimates for structural breaks indicating that the parameters are stable as presented in Figures 3 and 4. On this basis, in the short-run *DA* and *AC* are determinants of import demand in Guyana. For example if *DA* increases by 1 percent, *ceteris paribus*, demand for *IM* will change by 0.43 percent.

Table 8. Estimated F-statistics and t-statistics for granger causality test

Dependent variable	ΔIM_{t-1}	ΔNI_{t-1}	ΔXC_{t-1}	ΔXR_{t-1}	ΔIR_{t-1}	ΔDA_{t-1}	ΔAC_{t-1}	Joint F-statistic	t-statistic
ΔIM_t	0.69 (0.41)	1.90 (0.17)	0.26 (0.61)	0.50 (0.48)	0.49 (0.48)	19.79* (0.00)	10.26* (0.00)	8.48* (0.00)	-1.07* (-4.70)
ΔXC_t	0.34 (0.56)	1.53 (0.22)	0.64 (0.42)	6.52* (0.02)	0.36 (0.54)	4.46* (0.04)	14.74* (0.00)	6.27* (0.00)	-1.36* (-5.53)

Notes: * Significant at the 1% level.

About the short-run and causality, we use the values recorded in Table 8. We infer shortrun Granger causality on the evidence of the calculated F-statistic, 8.48, which directs that we reject the joint-null hypothesis of no lags. Therefore, short-run changes in the *NI*, *XC*, *XR*, *IR*, *DA* and *AC* Granger-caused *IM*. However, only the lagged changes of *DA* and *AC* are statistically significant. These findings support arguments about the importance of political economy consideration in the foreign exchange generation process.

Summary, discussion and policy recommendations

In this study, using Guyana as a case in point, we assessed the impact of official development assistance and aid as a percent of gross capital formation on import capacity over the period of 1960-2002 (data permitted) in the presence of gross national income, export-as-capacity to import, official exchange rate, and international reserves. The robust ARDL popularized by Pesaran et al. (2001) approach was used to estimate the import demand function. The study revealed some interesting predictor relationships with conclusions as follow. First, the foreign exchange variables played collectively a significant role in the determination of aggregate imports in Guyana over the period of 1960-2002. Second, the long-run elasticities of gross national income, exports-as-capacity to import, exchange rates, international reserves, official development assistance and aid as a percent of gross capital formation are determinants of aggregate imports in Guyana over the period. Third, the shortrun changes the elasticities of gross national income, exports-as-capacity to import, exchange rate, international reserves, official development assistance, aid as a percent of gross capital formation (technical assistance) Granger-caused import demand, indirectly. Fourth, specifically, elasticities with respect to official development assistance and aid as a percent of gross capital formation are the principal determinants of aggregate import for Guyana in both the shortrun and longrun. Fifth, more specifically, there is Granger causality from short-term changes of official development assistance and aid as a percent of gross capital formation to import capacity.

Conclusions 4 and 5 support arguments about the importance of political economy considerations of international institutions as agents of foreign exchange generation. The study shows official development assistance has a positive and significant impact on import capacity in Guyana over the period examined. This suggests at first glance that foreign aid to Guyana was effective in making a positive contribution to the growth of import capacity in direction as intended at UNCTAD (1964). The study shows also that a component, aid as a percent of gross capital formation, has a negative and significant impact on import capacity. Indeed this suggests that the technical cooperation element was biased in favor of technology that boosted the use of domestic resources more that foreign. If this is so, we may need to consider this contradiction in a positive light whereby the transfer of technology through international technical cooperation reduces the country's dependence on imported inputs for example-this is an issue for further research. Indeed, the preference for import substitution industrialization (ISI) was the policy adopted wholly in Guyana until 1989 when conditionalities for trade liberalization and globalization were placed by the multilateral financial institutions as imperatives for receiving international economic and financial support to ameliorate its difficulties. ISI as a policy was common in many developing countries, with Latin America leading the way. Yet the findings based on studies of other countries may be contradictory in general, given the importance placed by international institutions perception to the import capacity

needs of particular developing countries. This would be relative to the strength of the political and international relationship between the countries and the collective assessment of the multilateral institutions.

It is not difficult to perceive that Guyana's divergent foreign policies, economic development policy of nationalization and ISI, and persistent barrier to trade through high tariffs and prohibitions, would be supported by the foreign policy shaped to meet particular goals of a group of donor institutions and agencies in countries where property rights is a basic tenet. For instance while the United States of America dealt harshly with Guyana suspension of PL480 program, Canada was more supportive (subsidized the export of milk to Guyana) for humanitarian purposes, notwithstanding Guyana's nationalization of property and assets of their citizens. As such it is easier to speak of economic benefits of official development assistance in Guyana in terms of being transitory and temporary (more projects than) rather than a legacy as Malaysia would do from ship repairs to shipbuilding. Guyana's experience might not be dissimilar in several other countries.

These token examples when fitted to the positions taken at Monterrey (2002) and the Canada position on ODA suggest that the leadership of developed countries will no longer accept the practice where developing country could use solely or mainly a government's perspective of its path to development whereby it set agendas for cooperation without the participation of people or its citizenry (no more rhetoric of self determination). All development perspective should reflect current realities and development within the currency of political economy of international relations. Here the leadership in developing countries (including its people, institutions, private and public sector, NGOs) must recognize that "centers of power" (COPs), the DAC and even the BRICS[1], though preaching altruism may pursue a path of shared interest that match altruism with self-interest as a group or within the group or between group to the detriment of developing country or countries.

Likewise, leaders in the COPs, through transparency, can enhance the effectiveness of ODA. They should be prepared to consider joint projects and programs on behalf of a country of regions that would optimize the residual transfers, indigenized technology, and build human capacity. This will minimize the possibility for errors on the concept, type, content and disbursement of the aid (technical cooperation) and prevent any mismatch especially in countries in which there are social tension amongst ethnic groups and social classes. Undeniably, evidence of common elements of such donor practices in responses to nation building could be found for Latin America – Chile, Nicaragua, etc., and Africa – Ghana etc., thereby supporting the position that official development assistance was not effective in meeting the import capacity as was affirmed at the International Conference on Financing Development (UNCTAD, 2002).

There is a new global order that is driven by membership in CPOs and coordinated through the DAC and complemented by the BRICS. Yet, we believe that both local administrators and foreign donors could be guided by the policy changes of the Canadian ODA (Schmitz et al., 2003). It is important that leadership in both developed countries (multilateral, bilateral and private actors) and developing countries harmonize approaches to the allocation of aid and so reduce perceived lack of ODA effectiveness. This mean that greater consideration should be given to programs (longer life and people oriented, human capital and capacity development) than projects (huge infrastructure roads, bridges, etc.) which when identified, approved and implemented should carry the involvement of the stakeholders of the country (Schmitz, ibid). The programs or projects should be crafted so that there is total integration with the local economy for purposes of affecting growth in all sectors including social, legal, economic, political, technological and friendly to the environment[2].

The evidence is by no means conclusive, since Guyana presents only a case in point it serves on hindsight, to remind us that the evolution of an economic system cannot be known precisely by one person, committee or government. It takes the "village" or unity or agreement of purpose to indentify and select projects and programs that have the greatest positive impact for growth and development and as such attract related official development assistance funding. For instance the study has contributed to and reinforced the position that aid has not been effective if taken as a part of gross capital formation. The interest in understanding the apparent contradiction of the impact of aid as a percent of gross capital formation offers another area for further research.

[1] The BRICS are namely Brazil, Russia, India, China, and South America.

[2] Many developing countries should, like us, embrace the criteria of the CIDA program that suggests a truly global perspective not withstanding its own interest. It looks amongst of issues at the country's needs, commitment and capacity to manage aid effectively, economic and social policies-especially its commitment to improving its policies, the political and economic relations with the Canada [COPs], the human rights record, and the commitment to involving its population in development. The outcome of meeting such criteria would ease developing country meeting global standardized capabilities including trade liberalization policies, standardization capacity, culture of citizenry participative as national stakeholders, and enhanced ability to participate in technical standardization (Schmitz et al., 2003).

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