FOREIGN DIRECT INVESTMENT (FDI) INFLOWS AND THEIR IMPACT ON BARBADOS' CURRENT ACCOUNT: IMPLICATIONS FOR SUBSTITUTES/COMPLEMENTS BETWEEN FDI AND EXPORTS

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Presented at the 22nd Annual Review Seminar, Research Department
Central Bank of Barbados
July 24 – 27, 2001

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Presented at Canadian Economic Association (CEA) 2001 Annual Meeting, McGill University, Montreal , Canada, May 31 to June 3, 2001

Abstract. Foreign direct investment (FDI) capital inflows have played a significant role in the development of Barbados. These inflows are undertaken by the traded and non-traded sectors. This has implications for the current account and foreign reserves. If FDI is dominated by the former sector, the current account and reserves will be boosted and investment encouraged but if by the latter sector, the opposite will hold. Thereafter, the long and short-run impact of FDI inflows on the current account is addressed, with annual data spanning thirty years, using regression analysis. The results shows a positive relationship between FDI and the current account in the long-run, suggesting that FDI inflows and exports of Barbados are complements. In the short-run, FDI in the previous period impacts negatively on the current account but this pattern is reversed in the following period although not of the same magnitude. Thus over a two-year period, there is an inverse relationship between FDI and the current account, implying that FDI and exports are substitutes.

Keywords: Foreign Direct Investment, Current Account, Complements, Substitutes.

Introduction

Foreign direct investment (FDI) is defined as the holding of 10% or more of the voting stock of foreign enterprise. It takes the form of equity capital, retained earnings and loans from a parent company. Direct investment is a unique form of capital flow in that, unlike commercial lending, the funds are always part of a package of technology and management, both of which can enhance the productivity of the capital transfer. Direct investment also shares in both the risks and the rewards associated with the project financed. It is these two qualities – the combination of technology, management and capital with risk sharing-which give direct investment a special role in financing in developing countries.

FDI capital inflows have played an important role in the development of Barbados for many years. Firstly, they have a direct impact on Barbados' capital and financial account of the balance of payments. Secondly, since FDI is undertaken both by those sectors which primarily earn as well as use foreign exchange, it has implications for the performances of the export as well as import categories. If FDI transactions are undertaken primarily by the those sectors which use foreign exchange, then this will lead to a foreign reserves outflow, while the opposite should occur if the transactions are undertaken by those sectors engaged mainly in foreign exchange earning activity. It is against this background therefore that a study of this nature is being undertaken. Section 2 will examine some previous studies done on FDI transactions. The following section will look briefly at trends in FDI capital over the past thirty years. In section 4, attention will be paid to the long and short-run impact of FDI capital inflows on Barbados' current account from 1970 until 1999 with the use of regression analysis. The results will guide us in determining whether FDI into Barbados should be encouraged and also if this investment and Barbados' exports are complements or substitutes. This will be followed by a conclusion.

Section 2

Some Previous Studies Done On FDI Capital

The previous studies done on FDI presented some interesting observations for readers. For example, in The World Bank Background Document (1985), it was argued that a number of factors affected a country's policies with respect to direct investment. Its development strategy, market philosophy and underlying attractiveness as an investment location were all important. The size and growth of the domestic market, suitability for export-oriented production, and the natural resource endowment are all factors that influence location. The document added that despite offering substantial incentives to potential investors, countries in Africa and the Caribbean with small domestic markets were unable to attract significant inflows of investment. Countries in Southeast Asia, such as Malaysia and Singapore were able to attract direct investment on the basis of their export-oriented development policies without significant incentives.

The view was also advanced in the above Report that if more direct investment was to be fostered, developing countries had to critically review the necessity for various types of restrictions imposed on such investment. Restrictions had taken the form of limitations on the degree of foreign participation or prohibitions on entry into particular industries.

Codrington (1987) provided some insights on the Barbadian situation between 1977 and 1985, placing most emphasis on public utilities, manufacturing and tourism activities. In the case of public utilities, most of the funding for these organisations was provided by

non-resident enterprises that had a major controlling interest. As a result of this funding, telephone and electricity services became available to most consumers except those in the remote areas of the country. As far as manufacturing was concerned, in 1969, the Industrial Development Corporation (IDC) was established to attract foreign manufacturers and a ten-year holiday was granted to manufacturers selling their total output outside of Caricom[1]. During 1977 and 1985, foreign ownership was most pronounced in the metals group where 83% of the firms had at least 25% ownership.

The Hotel Aids Act (1956) was the earliest attempt to develop the tourist industry in Barbados. The Act exempted building materials and equipment for hotels from customs duties and also permitted a seven-year tax holiday for some establishments. The formation of the Board of Tourism two years later provided further stimulus to the industry. By 1970, North American and UK interests controlled a large proportion of the available capacity. Fifteen years later, just over one half of the establishments had at least 25% foreign ownership.

A somewhat different approach was adopted by Fry (1996) who examined how FDI in Pacific Asia improved the current account. The paper looked at the effects of foreign direct inflows for a group of six Pacific Basin economies and a control group of eleven other developing economies. It started by estimating the contemporaneous and lagged effects of foreign direct investment in the Pacific Basin on capital formation, national saving, imports, exports and economic growth in a five-equation macroeconomic model. Dynamic simulations indicated that despite the fact that FDI increased domestic investment, the positive direct and indirect (through accelerated growth) effects of FDI on national saving actually led to an improvement in the current account in the long run. This paper then showed that, outside of the Pacific Basin, FDI did not increase domestic investment or economic growth. When the sample countries of the control group attracted more FDI inflows, national saving, domestic investment and the rate of economic growth all declined.

Belgrave and Ward (1997) attempted to determine the impact of FDI on the Barbados economy, with specific reference to the manufacturing sector, for 255 firms over the period 1985 to 1995. To analyse such an impact, they looked at the influence of foreign equity on the survival of manufacturing firms. A binary choice probit model was utilized, in which the outcomes were defined as one if the firm survived and zero elsewhere. The survival rates of firms were regressed on the foreign equity variable, firm size and firm concentration. The results showed that the foreign equity variable was negative and insignificant in explaining the firms' survival. Even when the sample was disaggregated by sector, the foreign equity variable was insignificant.

The effect of FDI on economic growth in a cross-country regression framework was tested by Borensztein, DeGregorio and Lee (1998), utilising data on foreign direct investment flows from industrial countries to sixty-nine developing countries over the last two decades. Their results suggested that FDI was an important vehicle for the transfer of technology, contributing relatively to more growth than domestic investment. However, they argued that the higher productivity of FDI held only when the host country had a minimum threshold stock of human capital.

FDI policies under shared factor markets were analysed by Glass and Saggi (1998). They examined the consequences of foreign direct investment policies in a general equilibrium setting with several oligopolistic industries. It was discovered that by shifting labour demand across countries, FDI raised the wage in the host country and lowered the wage in the source country, thereby raising profits of the source country firms at the expense of the host country firms. Thus a tension would arise between worker interests and firm interests in the two countries. The case of cross-ownership of firms was also addressed. The conclusion reached was that, in the presence of cross-ownership of firms, subsidies to inward FDI could raise host welfare. By encouraging the shifting of production into its economy, the host government raised host wages while hurting host profits. However cross-ownership reduced the loss in profits, thereby allowing the wage to dominate.

Some observations on FDI flows to the Eastern Caribbean Central Bank (ECCB) Region were made by Williams and Williams (1998). They developed a macroeconomic model that encompassed investment, savings, imports, exports and growth equations in order to evaluate the impact of FDI on the ECCB economies over the period 1980-1996 with the use of pooled cross section time series data. FDI was found to positively impact on investment, savings and imports. Although it was also found to impact on exports of goods and services, the estimated coefficient was not of expected sign. The foreign direct investment growth nexus appeared to be through gross capital formation and in particular private investment.

A 1999 study by Bajo-Rubio and Montero- Munoz examined the relationship between FDI trade flows for the case of Spain, using quarterly data, during the period from 1977 to 1992, a period characterised by an intense liberalisation and external opening of the Spanish economy. The econometric methodology used in this paper was based on cointegration analysis. The authors proceeded by estimating export and import equations, in which, together with the traditional explanatory variables: income and relative prices, augmented with capacity utilisation, accumulated FDI was included as an additional variable. Their main result was the complementarity relationship found between foreign direct investment and trade. A higher Spanish investment abroad would lead to higher exports, whereas a higher foreign investment in Spain would result in higher imports. The results of the paper would support the view that increased capital movements, in the context of a process of liberalisation, would lead to higher trade flows.

The effect of FDI on firm growth was investigated by Chen and Ku (2000), with specific emphasis on Taiwan manufacturers. They argued that FDI could be roughly separated into an expansionary type and a defensive type. They further contended that expansionary FDI sought to exploit the firm-specific advantage in the host country whereas defensive FDI sought cheap labour in the host country to reduce production costs. Based on the Taiwanese data, both effects of these two types of FDI were examined on the survival and growth performance of investing firms. Both types of FDI were shown to be beneficial to the survival of firms. Chen and Ku discovered that expansionary FDI had the additional benefit of contributing to the sales growth in that country while defensive foreign investment was neutral to sales growth. Both types of FDI were shown to be uncorrelated with job creation or job displacement there.

The study by Blonigen (2001) was one that sought to determine whether there was any evidence of complementarity or substitutability between FDI by Japan into the USA and exports by Japan into that country. In this paper, the substitution/complementarity terminology was not concerned with how quantity changes with respect to changes in price as in a typical demand analysis but rather how changes in one quantity affected another quantity. Blonigen discovered that production of Japanese automobiles by Japanese firms in the USA resulted in an increase in Japanese exports of automobile car parts there. In this case, FDI inflows by Japan into the USA and Japan's exports were categorised as complements. However he also found that production of Japanese automobile parts by Japanese firms operating in the USA resulted in a contraction of Japanese exports of automobile parts to the USA. In this case, FDI direct investment and exports were substitutes.

Zhang (2001) examined whether FDI promoted economic growth, based on evidence from East Asia and Latin America. His findings were that in Latin America, FDI and gross domestic product (GDP) in Argentina did not move together in the long run nor impact on each other in the short run. A positive causality running from GDP to FDI was found for Brazil in the short-run and Colombia in the long run. FDI and Mexico exhibited a positive long-run equilibrium relationship in which such co-movement was caused by the bi-directional causality across the two variables.

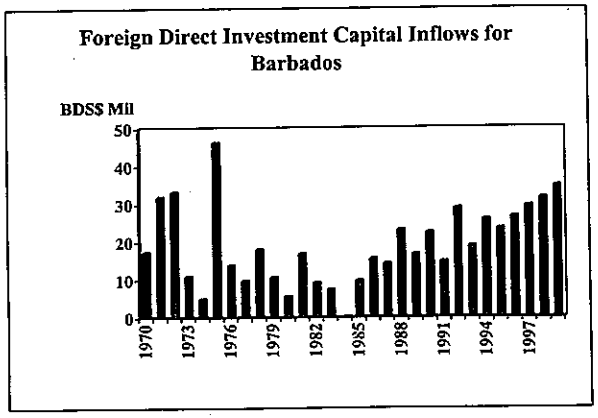
In East Asia, the short-run causal link from GDP to FDI was found for Korea, Malaysia, and Thailand. Although the causality from FDI to GDP did exist in Hong Kong and Taiwan in the short run, the causality was suggested to exist in Singapore in the long run.

Section Three

Trends in FDI Capital Inflows in Barbados

Between 1970 and 1976, FDI capital transactions accounted for the majority of long-term capital inflows to Barbados. During this seven-year period, long-term capital inflows rose by approximately $210 million and of this amount, direct investment capital inflows increased by $155 million (73.8%). Most of these activities were undertaken by parent companies, in the form of loans to their branches and subsidiaries and to a lesser extent, the decision by these companies to retain their profits in Barbados.

Although FDI capital inflows lost its dominance to other investment capital inflows after 1976, its contribution to the development of Barbados still maintained importance. Indeed from 1977 until 1985, FDI capital inflows rose by about $85 million (see figure on page 8). According to Codrington, during these nine years, direct investment was dominated by manufacturing and oil companies which together accounted for seventy-eight per cent. He argued that in the case of manufacturing firms, most foreign firms were producing electronic components and clothing. Firms that assembled electronic components attracted roughly three-fifths of branch investments and parent company loans while producers of textiles got one-third of the re-invested earnings and accounted for nearly all market loans. In the case of oil companies, in 1956, major foreign oil companies had already established retail outlets with one firm operating a refinery. However during the 1970's, the search for local oil started in an attempt to reduce imports. Codrington contended that between 1977 and 1985, these companies attracted foreign capital inflows in the form of long-term loans raised in the USA.



Source: Central Bank of Barbados

In the remaining fourteen years under study, FDI capital inflows increased in total by $326.1 million. However the major difference between the periods before 1985 and after was that in the pre-1985 period, these inflows were mainly boosted by parent company loans. After 1985, the primary sources of FDI capital inflows were undistributed earnings and investment in branches. The two of these categories together accounted for a rise of $274.3 million or 84.1% of total foreign direct investment inflows.

Section Four

The Long and Short-Run Impact on Barbados' Current Account

The purpose of this section is to show how FDI capital inflows impact on Barbados' current account balance (CAB). In addition to FDI capital inflows, the following explanatory variables have been considered for the current account equation. These are

tourist arrivals (ARR), the ratio of real foreign income to real income of Barbados, that is relative incomes (Y), relative prices and the real exchange rate.

The sign of FDI capital inflows will be ambiguous. A positive sign will suggest that FDI inflows are geared primarily towards foreign exchange earning activity while a negative sign will imply that they are concentrated mainly in those sub-sectors that consume foreign exchange.

An increase in tourist arrivals should improve the current account since it is expected to lead to rising tourist expenditure and improve the travel account. Similarly, relative incomes and the current account balance should move in the same direction since, as foreigners have more income available to spend, this should result in increased demand for local goods and services. The variable, relative prices, is defined here as the ratio of the consumer price index of Barbados' main trading partner, the USA, to the consumer price index of Barbados. An increase in the price of USA goods and services will reduce relative prices, assuming that the consumer price index remains unchanged. This increase will make foreign goods and services more expensive and should reduce import demand by locals. A fall in demand for foreign goods and services by Barbadians should reduce expenditure on these items and lead to an increase in the current balance. This suggests that relative prices and the current account balance should be negatively related. The real exchange rate is defined as the price of traded goods relative to the price of non-traded commodities. As the price of traded items rises, which results in an increase in the real exchange rate, local producers are encouraged to supply more items abroad and this can lead to additional foreign revenue, thereby increasing the current account balance.

2(a) Model Specification

Formally, a model of the current account can be expressed as follows:

$$CAB = f(FDI, ARR, Y, RP, RER) \qquad (1)$$
$$\quad ?\quad +\quad +\quad -\quad +$$

where all of the variables have already been defined. The model was estimated using ordinary least squares (OLS).

(b) Data and Variables

The data analysed in this study are annual observations over a thirty-year period, from 1970 to 1999. The set was compiled with the assistance of various issues of the Annual Statistical Digest and the Balance of Payments Publication, both published by the Central Bank of Barbados and the International Financial Statistics, published by the International Monetary Fund. Real income for Barbados is proxied by real gross domestic product and was estimated at 1990 prices. Real foreign income is estimated for the United States of America, United Kingdom and Canada. It is calculated by taking the real gross domestic product for each country and weighting it by their respective share of arrivals to Barbados before summing the annual totals. The estimation was based on 1990 prices. Relative prices and the real exchange rate have been calculated using 1995 and 1990 as respective base years. The econometric software package Eviews 3.1 was used to perform the estimations.

(c) Results

The number of cointegration relationships in this study is determined by the Johansen (1988) procedure and only one cointegration relationship has been found. Thereafter the Engle-Granger (EG) two-step method has been applied in this exercise. First, we estimate the coefficients from the cointegration regression, and then take the residuals from the estimate and use them lagged in a Vector Autoregression (VAR) of the changes of the explanatory and dependent variables. It is preferred to the Johansen (1988) maximum likelihood method since it is more powerful in small samples [see Inder, 1993, pp53-68].

The order of integration for each series was determined by the use of the Augmented Dickey-Fuller (ADF) test. This is a test of the null hypothesis of non-stationarity or a unit root [integrated of order d, I(d) where $d \geq 1$] against the alternative hypothesis of

stationarity [or integration of order zero, I(0)]. The ADF tests of the differences of each variable indicate that all of the variables are integrated of order 1, I(1). The long-run results are shown in equation 2.

$$CAB = -55.8 + 3.34FDI + 0.0005ARR + 22.78Y + 2.26\,RER - 40.48RP \qquad (2)$$

$R^2 = 0.746$ Adj. R^2 0.633 D.W. = 1.92 ADF = -3.578 (-2.9705) PP = -5.009 (-2.9705)

Equation 2 is the Engle-Granger (EG) cointegration regression. On account of the small sample size (30 observations), the bias in the EG estimator of the long-run relationship could be significant. Therefore the standard errors and t-values of the estimated regression coefficients are not reported since these statistics are not valid (see Banerjee, Dolado, Hendry and Smith, 1986, pp 253-278).

The results show that in the long-run equation, all of the explanatory variables are cointegrated since the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests reject the null hypothesis of stationarity of the residuals at the 5% level of significance. No first order serial correlation has been discovered in the Durbin Watson (D.W) statistics. All of the variables have the correct sign.

In the above equation, the variable having the greatest impact on the current account is relative prices. A unit increase in relative prices will improve the current account by just over $40 million whereas the tourist arrivals variable has a very weak impact on the dependent variable. A unit rise in relative real income will lead to an improvement of approximately $23 million in the current account. It is note worthy however that, based on the data provided, the current account balance will improve by $3.34 million for each unit increase in FDI capital inflows.

Our attention is now turned to the short-run impact of FDI capital inflows on the current account balance. This requires use of the error correction model, which nests both the long-run behaviour and short-run dynamics. An error correction model of variables can be formulated as long as those variables are cointegrated (for further reading, see Engle and Granger, 1987). An application of the Hendry General to Specific Methodology will be used in this instance. It begins with a model that is over parameterised and with the use of a step-wise process, eliminates insignificant variables until a parsimonious representation of the model is obtained. In this study, before reaching our final solution, variables both current and lagged periods were considered. Our initial model was restricted to only two lags on account of the small sample size. The results are shown hereafter in equation 3.

$$\Delta CAB = 15.01 + 2.92\,\Delta FDI - 3.65\Delta\,FDI_{-1} + 0.0004\Delta ARR - 0.0005\Delta ARR_{-1} + 24.2\Delta Y_{-1}$$
$$(0.98)\quad (2.00)\qquad (-2.32)\qquad (-2.18)\qquad (-2.36)\qquad (1.77)$$

$$-3.57\,\Delta RER_{-1} - 0.85U_{t-1}$$
$$(-2.08)\qquad (-4.71) \qquad (3)$$

$R^2 = 0.753$ Adj $R^2 = 0.667$ D.W. = 1.97 B-G (prob = 0.91) ADF = -3.969 (-2.9798) NORM = 0.24 ARCH = 0.69 CHOW = 1.51.

U_{t-1} is the error correction term that is lagged one period, while all other variables have been described before. Δ is the first difference operator, B-G is the Breusch-Godfrey Lagrange Multiplier test for serial correlation, NORM is the Jarque-Bera test for normality based on a test of kurtosis and skewedness of the residuals. ARCH is the Engle's k^{th} order autogressive conditional heteroscedastiscity test statistic, while CHOW is the CHOW breakpoint test for stability of the model.

The results show that the model is adequately specified and the residuals do not violate the classical assumptions of normality, homoscedasticity and serial dependence. Moreover the CHOW breakpoint test indicates that the parameters of the model are stable. The R^2 and adjusted R^2 values imply a reasonably good fit.

Four variables help to explain the current account in the short run, namely, FDI capital inflows for this year and last year, present and previous year's tourist arrivals, last year's relative real incomes and the previous year's real exchange rate. Both tourist arrivals and

the real exchange rate have opposite signs when compared to the long-run while the coefficient of relative real incomes is slightly stronger here than in the long run. The data imply that, assuming all other variables remain unchanged, a per unit increase in FDI capital inflows in the previous year will worsen the current account by $3.65 million. However, in the year that follows, there will be a significant turnaround in the relationship and a per unit increase in FDI will now improve the current account balance by $2.92 million, suggesting that as we move further away from the past and towards the future, the relationship between the two variables will be positive, a desirable feature. The error correction term is negative and significant, confirming the long run cointegrating results and its coefficient of 0.85 indicates a rapid speed of adjustment to its new long-run relationship.

What do the results tell us about FDI capital inflows into Barbados? Firstly in the long run, FDI has a positive impact on the current account. This implies that it is beneficial for Barbados to engage in attracting FDI. However the story goes even further, if we attempt to use these results to analyse the type of relationship between FDI capital inflows and exports. The mere fact that FDI capital inflows impact positively on the current account of Barbados implies that inward FDI capital from the rest of the world into Barbados results in net exports abroad. Therefore if we follow the definition of complements/substitutes as mentioned by Blonigen, then FDI inflows and exports are substitutes, a result contrary to that obtained by Bajo-Rubio earlier in this paper but consistent with Blonigen with regard to production of Japanese automobile parts in the USA and Japanese exports to that country. Indeed there are foreign firms operating in Barbados, which purchase goods from abroad (for example, electrical components), assemble these goods and then sell them to the rest of the world. However with the Barbadian situation, one must take other factors not addressed by Blonigen into consideration. In Barbados, since some foreign investment capital is undertaken primarily for tourism-related activity, the substitute relationship would be driven by rising exports of services, especially tourist expenditure.

In the short run, FDI capital undertaken in the previous period will lead to current account outflows (an increase in imports at the expense of exports) but this result will be reversed in the following year. However since the level of current account inflows in the following year will be insufficient to offset the outflows one year earlier, then over a two-year period, FDI capital inflows will worsen the current account balance in the short run.

The short-run results imply that FDI capital inflows over a two-year period will give rise to a complementarity relationship with exports. Initially, a substantial part of this investment is used to purchase goods and services from abroad. Although there will be a turnaround in the following year, it will be insufficient to offset the outflows recorded in the previous period.

CONCLUSION

This paper has attempted to examine the impact of FDI on Barbados' current account from 1970 to 1999, with the use of regression analysis. The signs are encouraging. In the short run, FDI capital will worsen the current account over a two-year period, as the outflows experienced in the previous year will exceed the gains achieved in the year that follows. This implies that FDI capital inflows and exports are complements. FDI capital inflows should still be encouraged at this stage because of the country's ability to achieve an improved current account balance after the deterioration of one year earlier. This positive pattern will continue into the long run where the data suggest that the long run coefficient of FDI will even be stronger than in the short run. However, unlike in the short run, FDI capital inflows and exports are substitutes. These results imply that it is in the interest of Barbados to provide the type of environment that will attract FDI capital since this will not only strengthen the capital and financial account but also improve current account transactions and the foreign reserves.

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[1] Caricom (The Caribbean Community) is a regional integration movement, the ultimate goal of which is the improvement of the standard of living of five million people of the Community. It was formally established in 1973 by the Treaty of Chaguaramas, which derives its name from the place it was signed in Trinidad and Tobago. The three objectives of the Community are economic cooperation through the Caribbean Common Market, coordination of foreign policy and functional cooperation in areas such as health, education and culture, youth and sports, science and technology, and tax administration. The Member States are Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines and Trinidad and Tobago.