The Impact of Foreign Aid and Foreign Direct Investment on Economic Growth: The Case of Taiwan's Caribbean Allies

Mangal Tricia Karen Vernessa*

Banking and Finance, Tamkang University, Taiwan

Abstract

This research seeks to recognize the role of foreign aid (AID) and foreign direct investment (FDI) in supporting the economic growth of small island developing nations in the Caribbean region. Four Caribbean islands that maintain diplomatic ties with Taiwan, specifically, St. Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, and Haiti are the focus of this study. Various tests were implemented in order to ascertain the connection between economic growth, FDI, and AID, using annual panel data from 2000 to 2021. Due to the frequent endogeneity issue that arises within the panel data used, the Generalized Method of Moments (GMM) model was utilized. Based on the findings, both FDI, and trade stand as significant drivers of economic growth for these Caribbean islands. Moreover, the correlation between FDI and gross domestic product (GDP) is notably positive. Similarly, a positive link was recognized between trade and economic growth. On the other hand, a significant negative correlation exists between foreign aid and economic growth. This finding highlights the potential need for improved oversight of aid inflows in order to achieve the anticipated economic growth. Furthermore, in the wake of these findings, fostering an accommodating economic climate becomes paramount, especially for attracting FDI and amplifying trade—both of which are pivotal for the economic development.

Keywords: Foreign Direct Investment, Foreign Aid, Economic Growth, Gross Domestic Product

JEL Classifications: F35, F21, F19

*Corresponding author

E-mail: TriciaMangal@tku.edu.tw

Address: 8 F., No. 45, Ln. 182, Beixin Rd., Tamsui Dist., New Taipei City 251008, Taiwan (R.O.C.).

1. Introduction

Proposed is the view by Rodrik (1999), "today's policy literature is filled with excessive claims about positive spillovers from FDI but the proof is sobering." Undeniably, the problems related to unraveling different effects at work and data restrictions have prohibited researchers from providing definite proof of positive externalities as a result of foreign direct investment.

However, foreign capital inflow has proven to be extremely beneficial to developing nations (Balasubramanyam et al., 1996; Chakraborty & Nunnenkamp, 2008; Alfaro et al., 2004). As with many other small island developing states, many islands in the Caribbean are heavily dependent on foreign investment and foreign aid. These inflows aid in the development of infrastructure, creation of jobs and the expansion of foreign reserves.

Haiti, Saint Vincent and the Grenadines, Saint Lucia and Saint Kitts and Nevis are all Caribbean islands that have diplomatic ties with Taiwan. Over the years, Taiwan has expressed its generosity by providing development aid to these islands as well as investment expertise. Apart from the provision of foreign aid, Taiwan's diplomatic partners have been gaining substantial benefits from Taiwan's expertise across a range of sectors. These benefits gained also extend to green energy solutions, where the islands have benefitted from Taiwan's knowledge and innovative practices which have become vital resources. Moreover, numerous educational opportunities have been granted by Taiwan, hence expanding the intellectual capacities of the citizens of these allied countries.

Additionally, Taiwan's efficient, strategic, and sustainable approaches in healthcare and farming have also been shared, thereby contributing to the advancement of medical practices, agricultural productivity and food security within these allied nations. Overall, this broad range of knowledge and expertise shared is positively influencing the development of Taiwan's diplomatic allies as food insecurity remains a persistent challenge across the Caribbean, since many nations continue to struggle to maintain consistent access to affordable and nutritious food (Central Bank Of Barbados, 2023). Moreover, many small island developing states struggle to establish sustainable and nutritious food systems, while simultaneously experiencing disproportionately high rates of obesity and type 2 diabetes (Marrero & Mattei, 2022). Consequently, with the continuous aid provided by Taiwan in the agricultural sector, such problems are being tackled head on.

Moreover, agricultural productivity has proven to aid in reducing poverty. Specifically, Sikandar et al. (2022) show that the adoption of sustainable agricultural practices significantly enhances agricultural productivity, which in turn contributes to poverty reduction in rural Pakistan. Their findings further indicate that foreign aid plays a complementary role by strengthening the positive effect of sustainable practices on agricultural output.

Taiwan, which was once largely an agrarian society like its Caribbean allies, has undergone a remarkable transformation. Currently, Taiwan ranks amongst the upper echelons of the global economy. Therefore, this makes Taiwan the most suitable and strategic ally for small island

developing nations that were also once heavily dependent on their agricultural industry. Beyond the financial assistance offered by Taiwan, invaluable expertise, developed from its own developmental journey is constantly being offered by Taiwan to its allies. The wealth of knowledge that is constantly being transferred is expected to be the catalyst in the advancement of these small island developing economies. This would therefore reinforce why Taiwan serves as the ideal ally for such nations.

Romer (1986) and Lucas (1988) both theorized the view that according to the endogenous growth theory, the wealth of economic knowledge that is held by an economy is an added important component in determining economic growth. Furthermore, knowledge positively influences growth as it improves the level of innovation and technical change. It also spills over for use by third-party agents. Specifically, knowledge is the unique component that could lead to long-term GDP per capita growth (Romer, 1990).

Taiwan, which is one of the four tigers of Asia, once relied on developmental aid. This is now the case currently for its Caribbean allies as they rely heavily on foreign aid and foreign direct investments. The Joint Commission on Rural Reconstruction (JCRR) played a pivotal role in providing both technical assistance and financial aid to agricultural agencies in Taiwan. These agencies were effectively supported by compiling a highly qualified technical staff in various fields.

Moreover, land reform and the reorganization of farmers' associations were essential reforms that the JCRR aided the government in executing. Additionally, it played a pivotal role in planning and coordinating agricultural programs aimed at fostering the economic development of Taiwan. During this period, Taiwan, greatly benefited from the transfer of knowledge and technical assistance, which played a significant role in driving progress and development. `

Taiwan's Caribbean allies are now receiving substantial technical assistance from Taiwan. Some of the more recent projects undertaken which provide technical assistance in the agricultural sector include the "Banana Productivity Improvement Project" in Saint Lucia, the "Banana Revitalization Project" in St. Vincent and the Grenadines. In Saint Kitts and Nevis, there was the "Enhancing Agricultural Adaptive Capacity to Climate Variability Project" and finally in order to improve the seed production of rice, the "National Rice Seed Production Enhancement Project" was conducted in Haiti. In addition to technical assistance provided in the agricultural sector, aid has also been provided in both health and education. In particular, there are projects designed to target major health problems that plague the islands. The "Capacity Building Project for the Prevention and Control of Diabetes" aims to alleviate the problem of diabetes in Saint Vincent and the Grenadines and the "Capacity Building Project for the Prevention and Control of Chronic Kidney Disease" is designed to target kidney disease. In the Caribbean, the primary drivers of sickness and untimely fatalities are conditions such as heart disease, cancer, stroke, and diabetes. Consequently, technical assistance provided in those areas will better equip the medical staff to adopt better tools and methods to prevent and control such illnesses.

Many islands in the Caribbean face high levels of unemployment, stagnant economic growth rates and more recently high levels of inflation. Consequently, one of the major goals of many of these economies is to achieve steady and improved economic growth rates. Subsequently, with the influx of foreign aid from Taiwan, the added sharing of knowledge should aid in leading to growth in the GDP per capita of its allies. Therefore, a look at how both the foreign aid inflows and foreign direct investment affects the economic growth in these small island developing countries will provide great insights needed to adjust the economic policies.

2. Literature Review

2.1 Foreign Aid and Economic Growth

Advancements in recent growth theory concluded that the ways in which aid can improve the growth of a nation is through further investment in physical and human capital. Moreover, it is believed that without the sharing of financial and investment expertise, the foreign aid may not help in generating sustainable growth. As it has been quoted many times and still rings true today, "if you give a fish to a man who is hungry, this will feed him for a day, however, if this hungry man is taught how to fish, he will be able to feed himself for a lifetime."

Many nations who receive financial aid are less developed and developing nations, hence if they are not equipped with adequate knowhow, the relief efforts through financial aid may prove to be short-lived or futile. In addition to aiding in closing the gap of domestic capital shortage, foreign aid has helped in improving various areas of developing nations specifically in the area of education, technological knowhow, managerial skills and health-care strategies.

The relationship that exists between financial aid and economic growth has been broadly discussed. Mixed findings on the correlation between foreign aid and economic growth have been found. Although a portion of the empirical results reveal that economic growth tends to be increased by foreign aid (Azam & Feng, 2021; Arndt et al., 2010), others have failed to find concrete evidence of the effect foreign aid has on economic growth (Bird & Choi, 2020).

Ekanayake et al., (2010) conducted a comprehensive analysis of the impact of foreign aid on the economic growth of developing countries. Their study utilized annual data from 85 developing nations covering Asia, Africa, Latin America and the Caribbean, for the period 1980-2007. The researchers used panel data in order to investigate whether foreign aid could enhance growth in these countries.

Although numerous previous studies have generated several mixed results, the results of this study concluded that there exist diverse effects of foreign aid on economic growth in those developing nations. Particularly, the foreign aid variable proved that there is a negative correlation in three out of four cases. However, the relationship that exists between these variables in the African region showed a positive association. Therefore, this finding suggests that foreign aid inflows have a favorable effect on economic growth in African nations.

Morrissey (2001) concluded that there exist numerous ways through which foreign aid can influence growth, specifically, aid enhances the investment in both tangible and intellectual resources. Moreover, it was deduced that the capability to procure technology or capital goods is improved with the increase in aid. Moreover, technology diffusion that expands the efficiency of capital and stimulates an endogenously driven technological shift is also made possible with the increase in foreign aid.

Dowling and Hiemenz (1983) studied the foreign aid-economic growth relationship for thirteen nations hailing from the Asian region. The research unveiled that external financial assistance has played a pivotal role in generating a positive and noteworthy influence of aid on economic expansion, as did the inflow of private capital and domestic savings.

Durbarry et al., (1998) also conducted a comprehensive analysis of the influence of foreign assistance on the growth of numerous developing nations. By employing an enhanced Fischer-Easterly model, an evaluation of the data using both cross-section and panel data methodologies was conducted. Findings from this study significantly contribute to the notion that foreign aid does indeed contribute positively to growth. However, a stable macroeconomic policy framework is needed in order for this to happen. The research further revealed that the impact of foreign aid on economic growth varies depending on the income level, how aid is allocated, and the geographical location of the recipient nations.

The influence of foreign aid on economic growth was also explored by Feeny (2005). The study was conducted on Papua New Guinea during the period from 1965 to 1999, utilizing time-series data. It was concluded that there exists limited evidence suggesting that aid has significantly contributed to the economic growth in Papua New Guinea but then becomes more effective during periods when the country implements a World Bank Structural Adjustment Program.

Research often highlights the need for certain systems and policies to be in place in order for foreign aid to be effective. Specifically, Fasanya et al., (2012) explored the influence of foreign aid on Nigeria's economic growth from 1970 to 2010. They found that aid flows have a substantial impact on Nigeria's economic growth. In particular, aid inflows led to an increase in domestic investment, but the population growth did not have a significant effect on aid flows. However, the influence of policy variables on aid was complex and, in some cases, even undid the positive effects.

Furthermore, Appiah-Otoo et al. (2022) showed that the growth impact of foreign aid is conditional on domestic financial development. Evidence from African economies indicates that aid alone does not promote economic growth and may be ineffective in countries with weak financial systems. In contrast, economies with more developed financial sectors are better able to channel external resources into productive investment, resulting in positive growth effects.

Foreign aid has increasingly been deployed as an instrument of soft power. Particularly, Krzymowski (2022) shows that the United Arab Emirates has institutionalized foreign aid as a core

component of its foreign policy, using it to advance national branding, support the Sustainable Development Goals, and shape international relations. Therefore, foreign aid now appears to be beneficial not only to the receiver but the provider of such aid.

2.2 Foreign Direct Investment and Economic Growth

The literature concerning inflows of FDI to small island developing states has almost been neglected owing to their minuteness, the absence of complete values of FDI influxes and the unimportance of these inflows compared to the international setting. However, for Small Island Developing States like St. Lucia, Saint Vincent and the Grenadines, Haiti and Saint Kitts and Nevis, Foreign Direct Investment (FDI) is recognized to be a vital provider to their economic development and thus it is ill-advised to disregard these influxes in spite of their relatively smaller monetary worth.

Additionally, FDI denotes a somewhat important and additional basis of investment funds and has the possibility to facilitate expansion and advancement. Over the years, there has been quite a number of theories developed concerning the connection between FDI and economic growth rate. In particular, according to the Solow growth model, FDI fuels capital creation and it also enables recipient nations to attract investments exceeding local savings. Nonetheless, this theory states that due to diminishing marginal returns to physical capital, the favorable impact of FDI on growth is noticeable in the short term but not sustained in the long term. Consequently, the economy would experience a consistent growth rate, giving the impression that FDI had not taken place, thus leading to an absence of substantial effects on the growth rate (De Mello, 1997).

From a neoclassical perspective, because of the assumption of diminishing returns to capital, Hoang et al., (2010) further elaborated that FDI's impact on income levels is contingent on its role in generating capital, without significantly altering the long-term growth rate. Conversely, in the neoclassical growth model, technological improvements and labor force were considered as exogenous by Solow (1956), and therefore FDI lacks enduring growth impact without technology enhancement. However, it does in fact raise the level of income only. When FDI positively affects technology, it results in growth advancement, as long-term growth is achievable solely through technological and population expansion (Kalirajan, Miankhel, & Thangavelu, 2009).

Additional theories state that, an essential contributor to economic growth and development in developing nations is foreign direct investment, this is partly due to the fact that the fundamental essence of economic expansion is the swift, effective transmission and transnational implementation of “best practice” (Ajayi, 2006). De Mello (1999) found that there exists a dual relationship of FDI and economic growth. Primarily, through the capital buildup, growth is achieved in the recipient nation. FDI influxes may increase on the stock of domestically accessible tangible assets and subsequently, the economic progress of the recipient country. Under these circumstances, the increase of tangible assets through foreign direct investment may have merely short-term influence on the economic expansion of the recipient country. Foreign Direct Investment (FDI) also holds the capacity to enhance growth by introducing foreign technologies, novel concepts, and advanced equipment into

the production process of the recipient nation (Borensztein et al., 1998).

Shaari et al., (2012) analyzed the bearing that foreign direct investment has on economic growth and unemployment during the period of 1980 to 2010 for the economy of Malaysia. The econometric model which was used to analyze such data was ordinary least squares regression. The findings uncovered that a 1% growth in foreign direct investment will lead to a reduction in unemployment by nearly 0.009 percent. Additionally, a one percent increase in foreign direct investment caused an expansion of national income by approximately, 1.219%. Subsequently, these findings indicate that a rise in foreign direct investment does in fact aid in the expansion of gross domestic product and reduction in the unemployment rate. The authors concluded that the government of Malaysia should place increased efforts on attracting greater foreign direct investment due to the positive aforementioned outcome.

In addition, a study conducted by Hossain & Hossain (2012) for both the short and long run of Pakistan, Bangladesh and India for the period of 1972-2008 studied the cointegration as well as the causal relationship between FDI and GDP. The study concluded that for Pakistan in both the long run along with the short run there is a substantial relationship between GDP and FDI. The results from the Granger Causailty test proposed that there is a unidirectional relationship found for both India and Pakistan. Subsequently, this means FDI played a significant role in boosting economic output and emerged as a crucial contributor and notable catalyst for the economic growth of both India and Pakistan.

Alternatively, Choe (2003) and Zhang (2001) conducted analyses to explore the relationship between FDI and economic growth. One of the studies analyzed data collected from 11 developing nations in East Asia and Latin America. With the use of cointegration and Granger causality tests, Zhang (2001) discovered that economic growth was positively influenced by FDI in five instances. This finding further highlights the importance of the conditions that exist in the host country like the trade policies and macroeconomic stability. Furthermore, Choe (2003) concluded that there exists a small inclination toward growth driving FDI as a bidirectional causality between foreign direct investment and economic growth was the main finding of this study. There was limited evidence suggesting that FDI directly triggers host country growth. Notably, rapid economic expansion might lead to an increase in FDI inflows.

Additionally, during the period of 1975 to 1995, cross data was accumulated to examine the interlink relationship among economic growth, foreign direct investment as well as financial markets. The study's outcome demonstrate that foreign direct investment can indeed stimulate economic growth. However, the relationship between those two variables can be affected by a number of factors like the financial system. More specifically, economic growth can be positively influenced by foreign direct investment if there is a stable financial system present in the country. Moreover, the contribution made to economic growth by FDI will be quite effective, from the perspective of the host country, if there is a stable financial system. The benefits of foreign direct investment are

numerous. Some of those innumerable benefits include, the introduction of new technologies and processes to the host economy. The host economy can also benefit from increased access to outside networks, as well as a transfer of necessary skills to the work force. Additionally, the results of this study uncovered that through the use of an improved or efficient monetary and fiscal policy, the host economy will be able to bring in more of the foreign direct investment and consequently, this increased FDI will lead to the prosperity of the economy in question (Alfaro et al., 2004).

Velnampy et al., (2013) also studied the connection that exists between both the economic growth and foreign direct investment in Sri Lanka and he uncovered that there was no noteworthy influence on economic growth from FDI. The study's conclusion indicates that there exists no enduring association between economic growth and FDI in the case of Sri Lanka. However, it was found that in the long-run, foreign direct investment does have a noteworthy influence on unemployment.

Many small island developing nations are heavily dependent on income from their tourism and travel sectors (Gu et al., 2022), although Lukman et al. (2022) found that that residents of Karimunjawa Island associate tourism development with adverse environmental effects. Nevertheless, significant effort and resources are aimed toward this sector. However, in many of these nations the inflation rate and unemployment rates may deter tourists due to the high levels of crime. Mangal (2025) found no significant long-run relationship between foreign direct investment (FDI) and macroeconomic distress, as measured by the Misery Index. However, In the short run, macroeconomic distress, and excess liquidity, as measured by money supply, may deter FDI. As a result, although FDI may pose may benefits for those nations, greater attention should be paid to the local economies macroeconomic health.

In addition to monitoring the broader macroeconomic environment, governments must also contend with external shocks such as pandemics. The COVID-19 crisis, in particular, led to substantial income losses across many small island developing states (SIDS), prompting the adoption of various recovery strategies. Gu et al. (2022) identify the travel bubble strategy as especially effective in influencing tourists' behavioral intentions. This approach relies on bilateral or state-level agreements that permit inbound travel from selected countries under specific conditions.

The literature suggests that the economic growth effects of foreign direct investment (FDI) and foreign aid are highly dependent on institutional quality. In particular, FDI is generally associated with industrial expansion and productivity gains which supports growth, particularly in economies with effective governance structures. On the other hand, foreign aid can promote technological upgrading, though its growth impact may be weakened when governance incentives deteriorate. Overall, governance plays a central role in shaping how both FDI and foreign aid translate into sustained economic growth (Farooq, 2021).

Numerous studies have emphasized the benefits of FDI. In particular, Sookram et al. (2022)

identified several key determinants shaping foreign direct investment inflows to Caribbean small island developing states, including economic growth, demographic expansion, capital formation, revenues from natural resources, and FDI from the previous period. Understanding these factors is essential for designing effective policies to attract and sustain FDI in the region.

3. Research Methodology

3.1 Data

To study the effects of foreign aid on the economic growth of the Caribbean economies, I have selected the data for Haiti, St.Kitts, St. Vincent and St.Lucia for the period starting from 2000 to 2021 based on the availability of the data. This period is important since it not only captures the period of the global financial crisis, the earthquake in Haiti and other natural disasters during the years but also includes the period of COVID-19. The annual data for the variables has been obtained from the world development indicators of the World Bank. Moreover, detailed data on the monetary aid provided to each island from Taiwan was unavailable to the public, so I relied on aggregate foreign aid figures for this study.

3.2 Research Modelling

In this section, I present the econometric framework to investigate the relationship between foreign aid and economic growth in the Caribbean by following (Dalgaard et al., 2004; De Mello, 1999; Hansen & Tarp, 2001; Younsi et al., 2021) who also investigated a somewhat similar relationship. Drawing on these considerations, the empirical model is specified as follows:

$$Growth_{it} = \beta_0 + \beta_1 AID_{it} + \beta_2 FDI_{it} + \beta_3 INF_{it} + \beta_4 Trade_{it} + \epsilon_{it} \quad (1)$$

, where $Growth_{it}$ is the annual gross domestic product growth and it measures the economic growth of country i at time t. Here i represents a country while t is the time period. AID denotes the financial assistance received for each country while FDI, INF and Trade denotes the foreign direct investment, inflation and trade of an economy.

$$Growth_{it} = \beta_0 + \beta_1 AID_{it} + \beta_2 FDI_{it} + \beta_3 INF_{it} + \beta_4 Trade_{it} + \beta_5 AID_{it} SQ_{it} + \beta_6 FDI_{it} SQ_{it} + \beta_7 (FDI_{it} \times AID_{it}) + \epsilon_{it} \quad (2)$$

, where $AID_{it}SQ_{it}$ and $FDI_{it}SQ_{it}$ are the squared terms of aid and foreign direct investment while $(FDI_{it} \times AID_{it})$ represents the complementing effect of FDI and AID on economic growth.

Due to the common endogeneity problem in the panel data, I employ Generalized Method of Moments (GMM) model for my analysis. GMM is a dynamic model as compared to earlier stated static models. This technique has the benefit to ease the difficulty encountered due to the potential endogeneity that exists among the variables. Moreover, to judge the validity of estimation results, two assumptions should be tested: the validity of the instruments as well as the residuals do not possess a second-order serial correlation. On identifying these two conditions, specification tests from Arellano and Bond (1991) and Sargan (1958) are adopted, respectively. The Sargan test of over-identifying restrictions is used in order to test the validity of the instruments that were used. Moreover,

if the null hypothesis of the Sargan test cannot be rejected, there is no instrument misspecification. Therefore, this would indicate that the instruments are valid.

4. Empirical Analysis and Discussions

This section centers on the presentation and interpretation of results derived from descriptive statistics generated, the correlation analysis, and panel regression analysis. Within this section, a myriad of analyses has been conducted to determine the relationship between foreign direct investments, foreign aid and economic growth.

The descriptive statistics, pairwise correlations and regression results of the selected variables have been presented in the Table 1., Table 2. and Table 3. respectively.

4.1 Descriptive Statistics

The descriptive statistics are reported in the Table 1. The GDP Growth represents the economic growth of the Caribbean economies and has a mean percentage of 1.55 which is quite low given the Caribbean economies are developing economies. However, there are instances where some economies report higher economic growth as seen from the higher standard deviation and variance. Overseas aid and financial assistance have been represented by ODA with a mean of about 3% and a lower standard deviation indicates that these countries receive about 3% of their GDP in the form of financial assistance from other countries. Foreign direct investment plays a key role in the economy of a country and Caribbean economies receive massive investments in the tourism sector. Lastly, the variable representing Trade exhibits a mean of 30.75604, indicating a moderate average level of trade, with a standard deviation of 15.12118 denoting notable variability. We see a high variability in trade which is quite visible from the standard deviation and maximum value. The trade volume decreased manifold due to COVID-19 and the recovery period again saw a major increase in trade volumes.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Deviation	Skewness	Kurtosis	Min	Max
GDP Growth	88	1.553	4.426	-1.714	10.058	-20.374	11.179
ODA	88	3.062	3.686	2.618	14.055	-2.032	24.368
FDI	84	8.556	6.805	0.370	1.877	0.069	22.876
Inflation	88	4.244	5.802	1.932	7.031	-3.078	28.700
Trade	88	30.756	15.121	-0.144	2.076	5.945	61.408

4.2 Pairwise Correlation

Table 2. below shows the correlation among the variables. From the table it can be observed that there exists a negative correlation between both foreign aid inflows and economic growth. The same can be seen from the results and discussion section that by applying the dynamic model, the same results were obtained. The negative correlation indicates that there is inefficient use of the foreign aid for the Caribbean economies. The highest correlation has been observed between trade and inflation.

There is a negative relationship between the two which is quite natural as Caribbean economies have been marred with higher inflation which in turn puts pressure on their imports leading to higher import bills and lower trade volumes. Apart from that, inflation has also pressurized the local economy and therefore the exports are diminishing. The table also shows the positive relationship between FDI and economic growth and it has been observed in the previous literature that FDI positively impacts the economic growth and is especially true in the case of developing economies.

Table 2. Pairwise Correlation

	GDPGrowth	ODA	FDI	INF	Trade
GDPGrowth	1				
ODA	-0.175	1			
FDI	0.281	-0.377	1		
INF	0.020	0.309	-0.379	1	
Trade	0.106	-0.639	0.387	-0.661	1

4.3 Panel Regression Results

The results from the panel data have been reported in Table 3. from different models. The results suggest that aid, FDI and Trade are significant predictors of economic growth in the case of Caribbean economies. The negative coefficient on lagged GDP growth suggests a phenomenon often explained by economic convergence theory. According to economic convergence theory, less developed economies tend to grow at faster rates than developed ones. The negative correlation signifies a potential process of convergence, where high growth rates in less developed periods are followed by a slowdown in subsequent periods, aligning the economy with more developed counterparts.

Table 3. Regression Results

Variables	(1)	(2)	(3)	(4)	(5)
L.GDPGROWTH	-0.168	-0.155	-0.161	-0.052	-0.193
	(0.128)	(0.126)	(0.129)	(0.118)	(0.126)
INF	-0.007	-0.009	-0.025	-0.097	0.00562
	(0.1)	(0.0975)	(0.101)	(0.099)	(0.100)
Trade	0.266***	0.285***	0.244***	0.185***	0.293***
	(0.064)	(0.057)	(0.067)	(0.056)	(0.0603)
AID	-0.251*		-0.279*	-0.755***	-0.134
	(0.151)		(-0.152)	(-0.182)	(0.130)
AID_SQ		-0.012*			
		(0.006)			
FDI	0.499***	0.503***			
	(0.097)	(0.094)			
FDI_SQ			0.0187***		0.510***
			(0.004)		(0.0955)
(AIDxFDI)				0.0829***	
				(0.020)	
Sargan test	91.625***	95.103***	96.51***	115.360***	94.821***
Constant	-9.724***	-10.86***	-6.812***	-2.717	-11.34***
	(2.671)	(2.360)	(2.471)	(2.076)	(2.388)

Note: T***, **, & * signify 1%, 5%, & 10% level of significance. The robust standard errors are presented in parentheses.

I observe a negative and significant relationship between foreign aid inflows and economic growth and the relationship persists for the squared term also. The negative coefficient associated with foreign aid is interesting from theoretical perspectives also, as this could be explained by the literature on the "Dutch Disease" or "Resource Curse." When a country receives substantial aid, it can lead to an appreciation of the domestic currency, which can thereby make other sectors less competitive and potentially hinder overall economic growth. Moreover, for some countries, domestic investments play a key role rather than the foreign aid (Islam, 1992). Another problem Caribbean economies are facing is in the form of inefficient allocation of the resources available in the form of foreign aid. It is either owing to the mismanagement of foreign aids received or due to the corruption in the government that a negative correlation was obtained between the economic growth and foreign aid. The allocation of aid by donors is also influenced by a variety of other factors, such as geopolitical concerns, historical connections, and cultural linkages, particularly when considering bilateral flows (Alesina & Dollar, 2000; Anderson, 2018). These factors also make the relationship more complex for the receiving country as the aid does not necessarily enhance the economic growth of the nation in question. The effective economic management is also reduced by the governments when there is

prolonged reliance on foreign aid. Being dependent on the foreign aid can lead to economic stagnation. If a significant portion of the budget comes from aid, governments might not be motivated to implement necessary reforms, leading to economic stagnation. Moreover, the theoretical perspectives pertaining to the effectiveness of aid pinpoint issues such as aid reliance and inefficient allocation. This could consequently contribute to the negative correlation. These results are also consistent with Rahnama, M., Fawaz, F., & Gittings, K. (2017), who investigated the relationship between foreign aid and economic growth by dividing the developing economies into low income developing countries (LIDC) and high-income developing countries (HIDC). He found that there exists a negative relationship between foreign aid and economic growth in the case of low-income developing countries which appears to be the case in this analysis. It is important to acknowledge the strong potential for reverse causality in the aid–growth relationship, particularly as both variables may be jointly influenced by external shocks, and it merely would not exist due to the "Dutch Disease" or inefficient allocation/corruption. Therefore, the dummy variable for the period from 2010 to 2013 was used in order to account for the earthquake and its following period. The results have been reported in column 5 of the table 3. The results indicate that the negative relationship between aid and growth in the panel is not a 'mirage' caused by humanitarian surges during disasters.

The relationship between foreign direct investment and gross domestic product is observed to be positive and significant. A positive coefficient demonstrates that a one-unit rise in FDI as a percentage of GDP corresponds to an increase of 0.499 units in economic growth. The positive relationship also confirms the previous literature about the relationship between FDI and economic growth. Pegkas (2015) found the positive relationship in the case of European countries. Moreover, the same holds true in the case of developing countries as Younsi et al., (2021) found a positive relationship between FDI and economic growth in the case of African countries. The positive and highly significant coefficient concerning foreign direct investment (FDI) is in line with the theory of capital accumulation and technology transfer. FDI brings not only financial resources but also technological advancements and management practices, and therefore it enhances the productivity and fosters economic growth. Apart from that, FDI has other positive externalities which contribute to the economic growth of the Caribbean economies.

The relationship between inflation and economic growth is found to be negative. The negative relationship between inflation and the dependent variable is consistent with the neoclassical growth theory. A higher inflation rate can erode purchasing power and lead to uncertainty, which, in turn, can deter investments and economic activities. The negative effects of inflation on the economic growth had been well documented in the previous literature (Barro, R. 2013). Consequently, the negative coefficient result supports the belief that lower inflation rates contribute to sustained economic growth. However, as trade can lead to specialization, trade was found to have a positive relationship with economic growth. Moreover, according to the theory of comparative advantage and international trade, trade can also lead to efficient resource allocation, and a greater and wider access to the global market. These aforementioned factors encourage economic growth as they allow

countries to specialize in producing goods and services in which they have a comparative advantage. As a result, this could lead to increased overall productivity and economic expansion. It has been recognized that foreign capital by itself is not adequate in influencing economic growth positively. But foreign capital can be channeled to economic growth by considering the absorptive capacity of the recipient country which plays a crucial role for the effects of foreign capital.

5. Summary and Conclusion

5.1 Conclusion

Given the heavy reliance of Caribbean economies on foreign capital inflows like foreign direct investment and foreign aid, this study investigates the impact of foreign capital on the economic growth of these economies. The study examined this relationship by first investigating the foreign aid projects undertaken in the Caribbean by different countries and then by using a dynamic panel data model. The results from the investigation reveal a negative relationship between both foreign aid inflows and economic growth while a significant positive relationship was observed between FDI and economic growth. These results also confirm the negative relationship between aid inflows and economic growth already observed in the literature specifically for the low-income developing countries. The negative relationship in the case of Caribbean economies exists owing to either the inefficient usage of the assistance received or the sustainable growth can be achieved by an increase in domestic investments. It also highlights that the foreign aid is either misappropriated or the government is unable to devise policies to efficiently use the financial assistance received from the other countries. On the other hand, FDI positively affects the economic growth in the Caribbean and a significant positive relationship was observed between the trade openness and economic growth.

On the basis of the results, I propose that foreign aid must be more transparent so that these resources can be utilized more efficiently and strict measures should be taken to eradicate corruption as it erodes the benefits associated with the aid in the Caribbean economies. Furthermore, a suitable economic environment must be enabled for the attraction of FDI along with trade as both contributes greatly to the economic growth of the Caribbean region.

5.2 Limitation of Study

With the annual reports published by the International Cooperation and Development Fund (ICDF) a significant amount of information was extracted and so they served as a vital resource throughout the duration of this study. The annual reports provided a wealth of information that enhanced the understanding of the significant amount of aid provided by Taiwan to its diplomatic allies. Yet, these documents did not reveal exact details about the monetary values of the financial aid and investments that Taiwan provided to its allies. Due to the lack of disaggregated data on Taiwan's aid, aggregate foreign aid was used as a proxy. Therefore, the results reflect general international aid effects and do not isolate the impact of Taiwan-specific projects.

Additionally, this study faced another challenge due to the limited availability of data on these island nations, a more comprehensive analysis of how foreign aid from Taiwan impacts their economies was not thoroughly conducted. Notwithstanding these significant constraints, maximum insights were extracted from the available information. This study attempted to form a clearer understanding of the impact of foreign aid on these nations' economic development.

Furthermore, this study used data collected from just four Caribbean islands, as a result, the conclusions may not be entirely applicable or generalizable to other Caribbean islands or developing island nations found in other parts of the world.

Acknowledgement

This work was supported by Taiwan's National Science and Technology Council under the Research Project for Newly-Recruited Personnel, Project Number: 111-2410-H-032-074. The author gratefully acknowledges the financial support that made this research possible.

References

Ajayi, I., (2006), "Foreign Direct Investment in Sub-Saharan Africa: Origins, Targets, Impact and Potential," *African Economic Research Consortium.*

Alesina A. and D. Dollar, (2000), "Who gives foreign aid to whom and why?" *Journal of Economic Growth*, 5(1), 33-63.

Alfaro, L., A. Chanda, S. Kalemli-Ozcan, and S. Sayek, (2004), "FDI and economic growth: The role of local financial markets," *Journal of International Economics*, 64(1), 89-112.

Anderson, J. E., (2018), *International trade theory*, In The New Palgrave Dictionary of Economics (pp. 6853-6862), Palgrave Macmillan, London.

Appiah-Otoo, I., A. O. Acheampong, N. Song, C. K. Obeng, and I. K. Appiah, (2022), "Foreign aid—Economic Growth Nexus in Africa: Does Financial Development Matter?" *International Economic Journal*, 36(3), 418-444.

Arellano, M. and S. Bond, (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations," *The review of economic studies*, 58(2), 277-297.

Arndt, C., S. Jones, and F. Tarp, (2010), "Aid, Growth, and Development: Have We Come Full Circle?" *Journal of Globalization and Development*, 1(2).

Azam, M. and Y. Feng, (2021), "Does foreign aid stimulate economic growth in developing countries? Further evidence in both aggregate and disaggregated samples," *Quality and Quantity*, 56(2), 533-556.

Balasubramanyam, V. N., M. Salisu, and D. Sapsford, (1996), "Foreign direct investment and growth in EP and IS countries," *The economic journal*, 106(434), 92-105.

Barro, R., (2013), "Inflation and economic growth," *Annals of Economics and Finance*, 14(1), 85-109.

Bird, G. and Y. Choi, (2020), "The effects of remittances, foreign direct investment, and foreign aid on economic growth: An empirical analysis," *Review of Development Economics*, 24(1), 1-30.

Borensztein, E., J. De Gregorio, and J. W. Lee, (1998), "How does foreign direct investment affect economic growth?" *Journal of International Economics*, 45(1), 115-135.

Central Bank of Barbados, (2023), "Mitigating Food Insecurity in the Caribbean: Strategies for a Sustainable Future," Retrieved February 2026.

Chakraborty, C. and P. Nunnenkamp, (2008), "Economic reforms, FDI, and economic growth in India: a sector level analysis," *World development*, 36(7), 1192-1212.

Choe, J. Il., (2003), "Do foreign direct investment and gross domestic investment promote economic growth?" *Review of Development Economics*, 7(1), 44-57.

Dalgaard, C. J., H. Hansen, and F. Tarp, (2004), "On the empirics of foreign aid and growth," *The Economic Journal*, 114(496), 191-216.

De Mello Jr, L. R., (1997), "Foreign direct investment in developing countries and growth: A selective survey," *The journal of development studies*, 34(1), 1-34.

De Mello, L. R., (1999), "Foreign direct investment-led growth: Evidence from time series and panel data," *Oxford Economic Papers*, 51(1), 133-151.

Dowling Jr, J. M., and U. Hiemenz, (1983), "Aid, savings, and growth in the Asian region," *The Developing Economies*, 21(1), 3-13.

Durbarry, R., N. Gemmell, and D. Greenaway (1998), "New evidence on the impact of foreign aid on economic growth," *CREDIT Research paper*, 98/8.

Ekanayake, E. M. and D. Chatrna, (2010), "The effect of foreign aid on economic growth in developing countries," *Journal of International Business and Cultural Studies*, 3(1).

Farooq, U., (2021), "Foreign direct investment, foreign aid, and CO2 emissions in Asian economies: does governance matter?" *Environmental Science and Pollution Research*, 29(5), 7532-7547.

Fasanya, I. O. and A. B. O. Onakoya, (2012), "Does Foreign Aid Accelerate Economic Growth? An Empirical Analysis for Nigeria," *International Journal of Economics and Financial Issues*, 2(4), 423-431.

Feeny, S., (2005), "The impact of foreign aid on economic growth in Papua New Guinea," *Journal of Development Studies*, 41(6), 1092-1117.

Gu, Y., B. S. Onggo, M. H. Kunc, and S. Bayer, (2022), "Small Island Developing States (SIDS) COVID-19 post-pandemic tourism recovery: A system dynamics approach," *Current Issues in Tourism*, 25(9), 1481-1508.

Hansen, H. and F. Tarp, (2001), "Aid and growth regressions," *Journal of Development Economics*, 64(2), 547-570.

Hoang, T. T., P. Wiboonchutikula, and B. Tubtimtong, (2010), "Does foreign direct investment promote economic growth in Vietnam?" *ASEAN economic bulletin*, 295-311.

Hossain, A. and M. K. Hossain, (2012), "Empirical Relationship between Foreign Direct Investment and Economic Output in South Asian Countries: A Study on Bangladesh, Pakistan and India," *International Business Research*, 5(1), 9-21.

ICDF, (2010-2020), 2010-2020 International Cooperation and Development Fund Annual Report.

Islam, A., (1992), "Foreign aid and economic growth: An econometric study of Bangladesh," *Applied Economics*, 24(5), 541-544.

Kalirajan, K. P., A. K. Miankhel, and S. M. Thangavelu, (2009), "Foreign Direct Investment, Exports, and Economic Growth in South Asia and Selected Emerging Countries: Multivariate VAR Analysis," CCAS Working Paper, 23.

Krzymowski, A., (2022), "Role and Significance of the United Arab Emirates Foreign Aid for Its Soft Power Strategy and Sustainable Development Goals," *Social Sciences*, 11(2).

Lucas Jr, R. E., (1988), "On the mechanics of economic development," *Journal of monetary economics*, 22(1), 3-42.

Lukman, K. M., Y. Uchiyama, J. M. D. Quevedo, and R. Kohsaka, (2022), "Tourism impacts on small island ecosystems: public perceptions from Karimunjawa Island, Indonesia," *Journal of Coastal Conservation*, 26(3).

Mangal, T. K. V., (2025), "FDI and the Misery Index in Saint Lucia: Analyzing the Impact on a Tourism-Dependent Economy," *International Journal of Economics and Financial Issues*, 15(5), 71-77.

Marrero, A. and J. Mattei, (2022), "Reclaiming traditional, plant-based, climate-resilient food systems in small islands," *The Lancet Planetary Health*, 6(2), e171-e179.

Morrissey, O., (2001), "Does aid increase growth?" *Progress in Development Studies*, 1(1), 37-50.

Pegkas, P., (2015), "The impact of FDI on economic growth in Eurozone countries," *The Journal of Economic Asymmetries*, 12(2), 124-132.

Rahnama, M., F. Fawaz, and K. Gittings, (2017), "The effects of foreign aid on economic growth in developing countries," *The Journal of Developing Areas*, 51(3), 153-171.

Rodrik, D. and D. Rodrik, (1999), *The new global economy and developing countries: making openness work*, Vol. 24, Washington, DC: Overseas Development Council.

Romer, P. M., (1986), "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, 94(5).

Romer, P. M., (1990), "Endogenous technological change," *Journal of Political Economy*, 98(5), 71-102.

Sargan, J. D., (1958), "The Estimation of Economic Relationships using Instrumental Variables," *Econometrica*, 26(3), 393-415.

Shaari, M., S. Bin, T. H. Hong, and S. N. Shukeri, (2012), "Foreign Direct Investment and Economic Growth: Evidence from Malaysia," *International Business Research*, 5(10).

Sikandar, F., V. Erokhin, L. Xin, M. Sidorova, A. Ivolga, and A. Bobryshev, (2022), "Sustainable Agriculture and Rural Poverty Eradication in Pakistan: The Role of Foreign Aid and Government Policies," *Sustainability*, 14(22).

Solow, R. M., (1956), "A Contribution to the Theory of Economic Growth Author (s): Robert M. Solow Source," *The Quartely Journal of Economics*, 70(1), 65-94.

Sookram, S., R. Hosein, L. Boodram, and G. Saridakis, (2022), "Determining factors of FDI flows to selected caribbean countries," *Journal of Risk and Financial Management*, 15(2), 48.

Velnampy, T., S. Achchuthan, and R. Kajananthan, (2013), "Foreign Direct Investment and Economic Growth: Evidence from Sri Lanka," *International Journal of Business and Management*, 9(1), 140.

World Development Indicators (n.d.), Retrieved from World Bank.

Younsi, M., M. Bechtini, and H. Khemili, (2021), "The effects of foreign aid, foreign direct investment and domestic investment on economic growth in African countries: Nonlinearities and complementarities," *African Development Review*, 33(1), 55-66.

Zhang, H., (2001), "How does foreign direct investment affect economic growth in China?" *Economics of Transition*, 9(3), 679-693.