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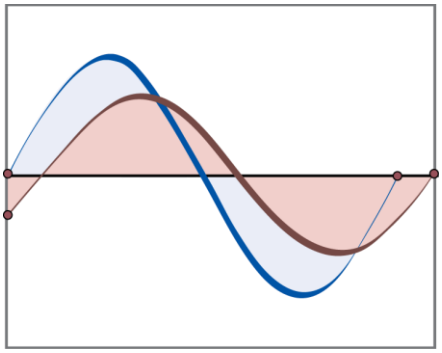

The Impact of De-risking on Trade Financing and Remittances in the Caribbean

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The actions of international financial regulatory bodies as well as individual countries resulted in international commercial banks examining their client bases and subsequently withdrawing their services from countries deemed high risk. Caribbean countries were impacted by this de-risking action. This paper quantifies the impact of de-risking in the Caribbean on remittances and trade financing under a panel feasible generalized least square model. A probit model first confirms that there is a demand for trade financing in the Caribbean. Utilising Berne Union data from 1995 to 2018 this study finds that de-risking was associated with an increase in the demand for short-term export credits, suggesting that companies exporting to the Caribbean were increasingly concerned about being paid. In examining remittance flows into and out of the Caribbean from 1990 to 2018, this research finds that de-risking significantly impacted outward remittances, though the relationship was surprisingly a positive one. While there was a negative relationship between inward remittances and de-risking, it was statistically insignificant. This suggests that firms may have been unwilling to send funds to countries that have been identified as high risk, while citizens in reacting to de-risking would have accelerated the movement of funds to other jurisdictions.

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1. Introduction

The ramifications of global developments in the financial sector began to affect the Caribbean in late 2014. The imposition of large penalties on financial firms, the need to improve efficiencies and other factors resulted in what has been deemed de-risking in the financial sector. The Financial Action Task Force (FATF) has defined de-risking as "the phenomenon of financial institutions terminating or restricting business relationships with clients or categories of clients to avoid, rather than manage, risk in line with the FATF's risk-based approach". Haley (2018) notes that de-risking can take several forms: (1) at the individual or firm level it could be the refusal of or restrictions on access to financial services; (2) the withdrawal or restriction of banking services from remittance service providers; and (3) the withdrawal of correspondent banking relationships (CBRs). The Alliance for Financial Inclusion (2016) reported that the closure of money remitter accounts; increased trade finance restrictions or associated costs; and decreased provision of services related to humanitarian activity were the most affected financial services by de-risking.

There have been a number of studies on the impact of de-risking, and these primarily tend to be either the results of a survey undertaken or a qualitative assessment of potential impacts. This paper will provide a quantitative approach to the examination of the effects of de-risking in the Caribbean Community (CARICOM) Member States[1]. In particular, the paper will focus on the impact on trade financing and remittances which have been identified by various surveys (e.g. World Bank 2016) as the two most affected areas.

In the Caribbean the increased global scrutiny of activities of financial firms resulted in correspondent banks withdrawing their services from several of the islands, increasing costs of conducting international transactions and the de-risking by domestic banks of segments where risks of money laundering were deemed to be high. The Caribbean financial sector has long been a target for international financial services regulators. In the early 2000s several of the countries were blacklisted for allegedly being tax havens. De-risking has affected the Caribbean as correspondent banking services have been withdrawn, for money remitters and commercial banking.

In 2015 for example the Bank of America withdrew its correspondent banking operations with Belize Bank and Atlantic Bank in Belize, and Barclays Plc severed ties with Jamaica. In the Bahamas, a 2015 report by the Inspector of Banks and Trusts revealed that four banks had lost correspondent services, though they were eventually able to find replacements. In July 2015 Fidelity Bank & Trust International closed its near 20-year Western Union franchise operations in the Bahamas, the Cayman Islands and the Turks and Caicos Islands. Wright (2016) noted that Jamaica's money service businesses (cambios) were affected as a leading local bank no longer accepted foreign instruments and remittances from some money service businesses (MSBs). In Haiti, all seven local banks experienced terminations or restrictions in service. He further reported that within the Eastern Caribbean, including Barbados and the Eastern Caribbean Currency Union (ECCU), Canadian banks have come under stringent regulatory controls of the Canadian Office of Supervision of Financial Institutions (OSFI), requiring correspondent banks to know their customers'

[1] The Member States of CARICOM are Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago.

customers. In several of the Caribbean countries access to banking services for private members clubs (casinos) was restricted or eliminated.

Trade financing facilitates international trade by providing a measure of security of payments between the importer and exporter. For the Caribbean countries, this form of financing is very important as these economies have historically been described as highly open. Indeed, the Member States of CARICOM are highly dependent on imported goods either for final consumption or as inputs into the production process. The withdrawal of trade financing services has been noted globally. The International Chamber of Commerce (2018) reported that Society for Worldwide Interbank Financial Telecommunication (SWIFT) trade finance volume fell 2.35 per cent in 2017; while their survey of financial institutions clients found that access to trade finance continued to contract. Reduced availability of trade financing could mean that the ability of the CARICOM countries to import goods would be restricted.

For several of the Caribbean countries remittances are a significant source of inflows of financing. For example, in 2018 remittances as a per cent of gross domestic product was over 33 per cent for Haiti, 15 per cent for Jamaica and nine per cent for Dominica. While globally there has been a push to lower the cost of sending remittances, in the era of de-risking there was some reversal of the trend as prices increased in some countries as the Money Transfer Organizations (MTOs) either reduced their footprints or completely withdrew their services from some countries.

The next section of the paper will provide a brief overview of the literature on de-risking. Section three focuses on trade financing. It starts with an assessment of the demand for trade financing by Caribbean firms; here a probit model is employed and data from the World Bank Enterprise Surveys is used. The section then looks at the impact of de-risking on imports and trade financing utilising a feasible generalised least squares (FGLS) model. The fourth section looks at the impact of de-risking on remittances in the Caribbean and also uses an FGLS model. The paper concludes with some recommendations.

2. Literature Review

The recognition by the international agencies that de-risking was having an impact on financial transactions resulted in several surveys initially being conducted. Many of these studies sought to quantify the number and type of financial transactions being affected, as well as identify the drivers of de-risking and put forth some recommendations to address the issue. The World Bank (2015), in examining the remittance market in several countries, found that over 2010-2014 there was an upward trend in the number of closed accounts, with 46 per cent of the MTOs indicating that they had notification of pending closure of accounts. According to the survey the main drivers of de-risking in the remittance market included profitability, pressure from other actors (correspondent banks) and fear of regulatory scrutiny, lack of confidence in the MTOs' procedures, and reputational risk. Some of the MTOs and/or their agents were able to work around the closure of the accounts by 1) using other MTOs, 2) operating via cash management companies and physically transporting cash, and 3) using personal bank accounts. Since this survey, there have been other reviews of the impact of de-risking on remittances (Financial Stability Board, 2018) including some country-specific ones such as Somalia (El Taraboulsi-McCarthy, 2018) and Haiti, Liberia, Nepal and Somalia (United States Government Accountability Office, 2018). The World Bank (2015) examined the responses of 110 jurisdictions, 20 large international banks and 170 local/regional banks to questions of correspondent banking relationships (CBRs). It was found that approximately 50 per cent of the banking authorities and slightly more local/regional banks indicated a decline in CBRs. Further, the Caribbean region was identified as being the most affected with the United States (US) being the home country of many of the correspondent banks that are withdrawing from foreign CBRs. In a wider study on de-risking in

2017 the International Financial Corporation conducted a survey of 306 private-sector emerging market banks in 92 emerging markets and found that just over one-quarter of survey participants indicated that the size of their correspondent banking network decreased in 2016. The shrinkage was found primarily in Sub-Saharan Africa, Latin America and the Caribbean, and Europe and Central Asia.

Regionally institutions such as the Caribbean Association of Banks (CAB), and the Economic Commission for Latin America and the Caribbean also conducted surveys on the prevalence of de-risking in the Caribbean. In 2016, a survey by the CAB of its 39 members (only one member did not respond) found that 55 per cent of respondents had lost at least one CBR. While the Bank of America was primarily responsible for the loss of the relationship (the survey identified that the Bank of America was the sole US correspondent bank for six regional financial institutions before the de-risking began), other American banks also de-risked the Caribbean. After the United States, correspondent banks from Europe such as ING Bank and Commerzbank were responsible for the loss. The CAB survey found that the most affected countries were Suriname followed by Guyana and Jamaica and the most severely impacted services were wire transfers, foreign cheque clearing and cash letter deposits.

Vasquez (2017) in looking at the impact of de-risking in Belize found that the flow of wire transfers had been affected; there was an increase in direct costs to send and receive funds electronically and a reduction in the availability of foreign exchange. The author noted that there was increased activity in the informal cash economy and the parallel foreign exchange market. It was suggested that the loss of CBRs could have a negative developmental impact as it could "*increase financial exclusion, reduce trade flows, hamper the ability of foreigners (e.g., tourists) to obtain payments for services, and compromise the current and future global competitiveness of Caribbean businesses*". Duncan (2019) investigated the case of a small offshore bank in Belize. He described how the loss of the correspondent banking services occurred and the measures the bank took to re-establish its connections to the global payment system. The author noted that the offshore bank could not conduct international funds transfer for approximately one month, and some customer transactions were re-routed through other banks. This shift led to a significant drop in consolidated deposits in Belize's international banking sector. There were additional costs as the bank had to re-establish connections to the global payments system. Alleyne et al (2017) noted that various surveys have found that in the Caribbean the cost of maintaining correspondent banking services has risen. These costs include an increase in charges by the correspondent banks as well as the costs related to improvement in Anti-Money Laundering/Combatting the Financing of Terrorism (AML/CFT) compliance. Gordon (2019) surveyed commercial banks and cambios in Jamaica in order to assess the impact of de-risking on these businesses. He noted that only one commercial bank that had been de-risked reported a decline on overseas transactions. However, the growth in foreign payments for banks that lost at least one CBR was half that of the growth in transactions in banks that were not de-risked. In the case of cambios, Gordon (2019) found that these entities faced restrictions on their banking activities as well as increased fees. While the cambios reported that there was little impact on the volume of their business transactions and revenue, operational costs were higher as they sought to keep their local banking relationships. McLean et al (2018) sought to identify the impact of de-risking on several Caribbean countries. These are highlighted in Table 1 below.

Table 1: Economic Impact of De-risking for Selected Caribbean Economies

Country	Impact of De-risking
Antigua and Barbuda	• Products negatively affected; wire transfer services were severely constrained • Increasing costs of enhancing AML-CFT framework • Additional transaction cost and delays regarding the use of alternative providers of correspondent services • De-banking investors participating in the Citizens by Investment (CBI) program by foreign banks.
Belize	• Cost increases on US dollar transactions • Doubling of transaction and operating costs • Decline in the value of wire transfers • Income losses associated with the inability to execute international trade transactions • Costs related to strengthening AML-CFT • Inability to provide US dollar check clearing • Shift in deposits and in the distribution of banking sector lending • Decline in assets of international banks • Reduced transparency and longer processing times for transactions
St. Kitts and Nevis	• Response of correspondent and respondent banks to the CBI program • Blacklisting of offshore financial sectors • De- marketing of financial institutions in Nevis.

Source: Adapted from McLean et al (2018)

Despite the pervasive impact of de-risking, there are few quantitative studies seeking to measure the impact. One exception to this has been Alleyne et al (2017) who utilized a stress test type scenario using bank-level data in an attempt to estimate the potential cost of the loss of correspondent banking services in Belize. Two scenarios are envisaged: a "low stress" scenario where the loss of CBRs reduces the value of cross-border transactions by about 10 per cent; and a "high stress" scenario, where about 70 per cent of transactions are eliminated. Implementing the high-stress case suggested that real GDP growth could fall by as much as 5.3 percentage points annually relative to the baseline during 2017-2021; international trade would fall by 23–26 percentage points of GDP during the same period, foreign direct investment would fall by 1.9-2.5 percentage points of GDP. The capital adequacy ratios would also decline by around 7.5 percentage points.

Collin, Cook, and Soramäki (2016) utilizing SWIFT data on cross-border payments sought to measure the effect of financial `grey-listing' on transactions between countries. They note that regulatory damage can be costly for financial institutions and can lead to de-risking. By examining the monthly number of cross-border payments in the SWIFT network between 2004 and mid-2014 and information on the timing of grey-listing of countries by the FATF, the authors found that being grey-listed resulted in a 7-10 per cent reduction in the number of payments being sent to a country by the rest of the world. However, the effect seemed to be asymmetric as the authors did not find a consistent effect on the number of payments being sent out of an affected country. Also, the study finds no consistent evidence that grey-listing significantly affected cross-border flows such as trade, remittances and official development aid[2].

A study by Niepmann and Schmidt-Eisenlohr (2014) sought to examine what would happen to US exports if there is a reduction in the supply of letters of credit (LCs) from US banks. They found that a significant relationship exists between LCs and exports, and a one standard deviation shock increases export by approximately 1.5 per cent. The effect varies by the economic situation of the destination country, with a stronger effect for exports to small and poor countries.

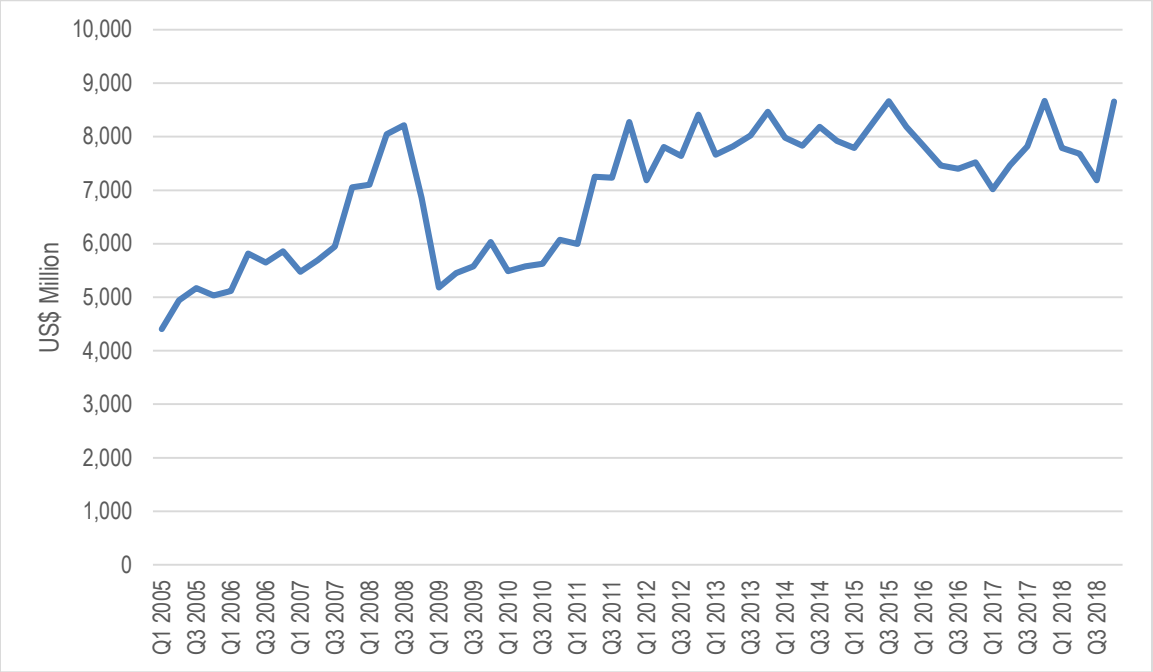
[2] The findings (significant or insignificant) differed across model specification and methodology used.

3. Data, Methodology and Results – Trade Financing

To undertake the study on the impact of de-risking, inspiration is drawn from the trade financing literature. Trade financing can take various forms including (1) open account – where the shipment takes place before payment; (2) cash-in-advance – where exporters receive payments prior to shipping; (3) letters of credit – where a financial institution guarantees payment once all the terms and conditions specified are met and (4) cash against documents. According to the literature, letters of credit is the most widely used form of trade financing. The quantitative literature tends to take two strands. In one strand authors utilise a gravity type equation to measure the impact of macroeconomic variables on imports. Typically, the relationship tested is one between trade financing and imports, as well as other key macroeconomic variables. Generally, there is a positive and significant relationship between the level of imports and trade financing (Auboin and Engemann, 2013 and Brandi and Schmitz, 2015). In the other strand of the literature, authors are able to use data which directly link firms to the use of /demand for trade financing and thus can examine the impact of firm characteristics. While issues such as age and size of the firms are typically examined the main focus of these papers is the impact of the availability of trade credit on trade. Chor and Manova (2012) found that during the global financial crisis countries with tight credit markets exported less. Türkcan (2015) found that for Turkey after 2008 both exporters and importers tended to use the cash-in-advance method for payment suggesting that there was a decline in the availability of trade financing. Muûls (2015) found that Belgian manufacturing firms had a higher tendency to trade if they had lower credit constraints and better credit rating. Using a survey of firms in Brazil, Carvalho and Schiozer (2014) found that trade credits and short-term bank loans were supplementary forms of financing; and there was a positive relationship between sales and trade credit demanded.

The Caribbean countries are heavily dependent on imports of goods for consumption and use in productive activities. A review of the quarterly trade data, sourced from the International Monetary Fund (IMF), suggests that imports after the 2014 period have generally declined (Chart 1). For most of the period, 2005 to 2018, imports by Jamaica and Trinidad and Tobago dominated imports of CARICOM representing just over half of total imports, although the ratio has since declined to around 40 per cent by 2018.

Chart 1: CARICOM Imports: 2005-2018 (US$ Million)



Source: IMF Direction of Trade Statistics Database (accessed July 30 2019)

Given the high levels of imports in the CARICOM region, financing must be available for companies to meet their payment obligations. Thus far, there has been no published work on trade credits in CARICOM[3] and this is likely due to the lack of available data on the topic. To undertake the analysis trade financing data was sourced from several different institutions and datasets.

3.1 The demand for trade financing

To firstly understand the demand for trade financing or credit, information was sourced from the World Bank Enterprise Survey (WBES) of firms in CARICOM. The most recent survey for these countries was conducted in 2010, with the exception of Suriname whose latest survey was conducted in 2018. A total of 2,502 firms, which included manufacturing, retail and services companies, were surveyed from 13 of the 15 CARICOM Member States[4]. The figures revealed that, on average, 98.9 per cent of the firms surveyed had a savings or checking account only, 43.5 per cent had a bank loan or line of credit, and 24.7 per cent of firms indicated that access to finance was a major constraint (See Appendix 1). In particular, access to finance has been a major constraint especially in Antigua and Barbuda, Belize, and St. Kitts and Nevis.

[3] Mahabir and Rahaman (2016) examined the issue for Trinidad and Tobago.
[4] Surveys for Haiti and Montserrat were not conducted by the World Bank.

In order to examine the availability of trade financing, a similar approach to Wignaraja and Jinjarak (2015) was adopted. In their study, a Probit estimation was employed to analyse credit availability for small and medium enterprises (SMEs) in Asia using the WBES data. The following equation was estimated to determine whether the characteristics of the firm influence their demand for financing.

$$Probability\ (Line\ of\ Trade\ Financing\ Availability) = f(Firm\ Age, Size\ of\ Firm, Sector, Gender) \quad (1)$$

From the WBES, the percentage of inputs or materials that are paid for after delivery is translated into a binary figure (1 – positive per cent, 0 – nil) to generate the probability that the firms have a line of trade financing available. The age of the firm is derived from the year of establishment of the firm, and the size of the firm is measured by the number of permanent employees. The database segregates the firms into manufacturing and other services. Gender is also included to analyse whether the top manager being female has any influence on the financing demands of the firm.

The results of the investigation for CARICOM suggest that the typical firm characteristics such as age, size and sector play a role in the availability of trade financing. In the case of size, the larger the firm the more likely it is to pay its supplier after delivery of the goods. To check the importance of age, both the actual age of the firm and age squared are used. While age is significant, the signs of the coefficients suggest a U shaped relationship between age and the supplier being paid after the delivery of the goods. The one important factor that appears to determine the demand for trade financing is the sector in which the firm operates. Firms in both the manufacturing and services sector tend to pay suppliers after the delivery of goods.

The WBES database also provides information on whether inputs or materials are paid for *before* delivery or are paid for *on* delivery, as well as the availability of a line of credit (not specific to trade purposes). While the age of the firm does not impact either the availability of a line of credit or the supplier being paid before delivery, it is significant on the supplier being paid on delivery. The size of the firm is also important in having a line of credit and whether the supplier is paid before goods are delivered. Although, the sector in which the firm operates is significant for the supplier being paid on delivery it is insignificant for the supplier being paid before delivery. Meanwhile, results revealed that the gender of the top manager in the firm is a determinant in the firm's demand for trade financing as it was significant at the 10 per cent level.

Table 2: Demand for Trade Financing – CARICOM

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age	0.001244	0.003895***	0.003669***	-0.000282
Age^2	-0.000008	-0.000030***	-0.000019***	0.000000***
Size	0.000247*	-0.000127	0.000192**	0.000233**
Gender	0.087140*	0.002195	0.043422*	-0.046265
Manufacturing	0.048179	0.221618***	0.133254***	-0.025455
Services	0.011521	0.138834***	0.096877***	-0.051659***

Marginal effects reported
*10%, **5%, ***1% level of significance.

When examining the demand for trade financing from an individual member country level, the results suggest that age and size are not significant determinants of a firm's access to trade financing in Antigua and Barbuda, Bahamas,

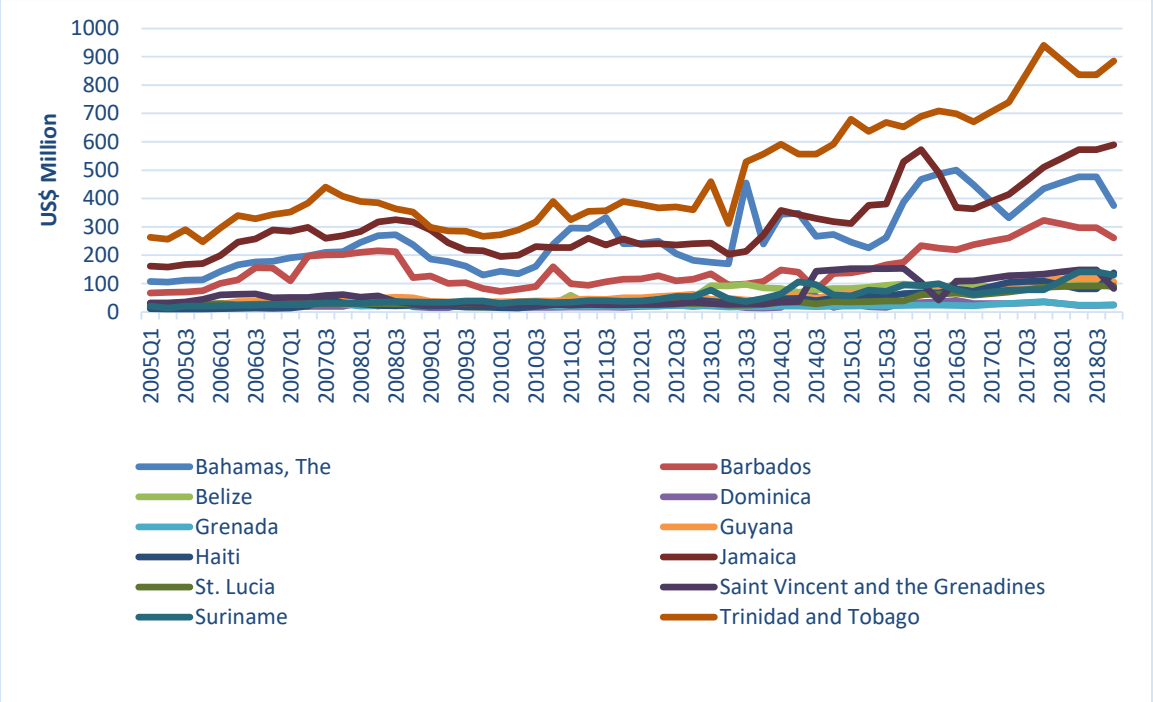
Barbados, Grenada and St. Kitts and Nevis. However, those factors are significant for Trinidad and Tobago. Age is also a determinant of trade financing for St. Vincent and the Grenadines, Suriname and Jamaica. Interestingly, in Jamaica, the demand for a line of credit decreases as firms get more mature whilst the likelihood of the firm paying the supplier after the delivery of goods increases as the firm gets older. For all CARICOM members, the sector of the firm is significant in the demand for trade financing. This is particularly the case for manufacturing firms in The Bahamas, Barbados and St. Vincent and the Grenadines, possibly as part of diversification efforts.

With regard to the size of the firm, larger firms would demand more lines of credit as suggested in Belize, Dominica, Guyana, St. Lucia and Suriname. This is unlike Antigua and Barbuda, The Bahamas, Barbados, Grenada, St. Kitts and Nevis and St. Vincent and the Grenadines, where firm size is irrelevant in determining the firm's demand for credit lines. Surprisingly, the results revealed that firms with females as the top manager are more likely to pay suppliers after goods have been delivered in the countries of the Bahamas, Dominica, and Jamaica (Appendix 3).

3.2 The availability of trade financing

Central Banks in the Caribbean region do not typically publish trade financing data obtained from commercial banks. Thus to examine the issue data from the Berne Union, which is a group of private and state export credit insurers, is utilised. The dataset is available on a quarterly basis from Q1 2005. It covers most of the CARICOM countries with the exception of Montserrat, Antigua and Barbuda, and St Kitts and Nevis which only had two years of data (2005 and 2006). The insured export credits are composed of long-, medium- and short term credits and represent the actual insurance which is used to cover actual loans. Short term credits which are more closely aligned with letter of credits and are thus used in the analysis (Chart 2). The summary statistics are presented in Table 3.

Chart 2: Short Term Insured Export Exposures to CARICOM: 2005-2018 (US$ Million)



Source: World Bank Joint External Debt Hub

Table 3: Summary Statistics for Trade Financing

	Mean	Std. Dev	Min	Max
Short Term Export Credit (US$ million)	131.22	161.39	10.00	940.00
Imports(US$ million)	562.46	703.50	34.57	4,024.41
Exchange rate	0.33	0.27	0.00	1.00
Inflation Index	108.12	26.44	52.67	251.47
GDP (US$ million)	1,470.98	1,653.01	91.00	7,058.25

A closer examination of the Berne Union data suggests that there is significant heterogeneity in the use of trade financing from these countries to facilitate imports into the various Caribbean countries. While typically Berne Union finances (short-term) represent an average of 20 to 40 per cent of imports, there are some outliers, for example trade financing covers less than 10 per cent of Haiti's imports, while on the other extreme it covers over 100 per cent of imports in St. Vincent and the Grenadines. An even closer look suggests that after 2016 countries had an increase in the use of this source of financing.

To test the relationship between trade financing and imports the literature typically estimates the following equation:

$$\log(M_t) = \beta_0 + \beta_1 \log(TF_{t-1}) + \beta_2 \log(gdp_{t-1}) + \beta_3 \log\left(reer_{t-1)}\right) + \varepsilon_t \qquad (2)$$

Where:
TF represents trade financing
GDP represents the Gross Domestic Product
REER is the Real Effective Exchange Rate
M is the value of imports.

To facilitate the estimation of the equation, quarterly data is sourced from the various IMF databases for imports, inflation and exchange rate (as not all countries report a REER). GDP data is sourced from the respective countries and where not available the annual data is sourced from the IMF (divided into quarters). The Berne Union data is available from the World Bank. The dataset utilised is from Q1 2015 to Q4 2018. There is usually a lag (typically three months) between the acquisition of trade financing and the importation of goods.

To take into account the effect of de-risking a binary variable is utilised – with a value of 1 to indicate when de-risking occurred and 0 otherwise. The effect of de-risking was taken to occur for most countries from Q1 2015 except for Belize when it was a bit earlier in Q4 2014. While countries which lost correspondent banking relationships have been able to find substitutes, the effect of de-risking lingers as there may have been increased cost and increased vigilance. Panel Feasible Generalized Least Squares was used as the estimation procedure to take into account autocorrelation and heteroskedasticity. The variables were found to be stationary, though short-term credit was stationary only when taking factors such as trends and panel means into consideration (however, first differencing the variable resulted in a deterioration in the fit of the model).

Table 4: Results for Impact of De-risking on Imports

	lnimports
Lnshort term credit (-1)	0.283***
Lex(-1)	-0.076***
lCPI(-1)	-0.508***
Lqgdp(-1)	0.558***
Derisking	0.008
cons	2.274***
No. of Observations	610
Log likelihood	-106.7

* p<.05; ** p<.01; *** p<.001

Estimating equation two and substituting the components of the REER – exchange rate and inflation – finds that imports have not been significantly affected by de-risking (Table 4). This may be due to the inelastic import demand that is typical for small open economies. Another possibility is that the importing parties were able to access credit directly from their suppliers or letters of credit from the local commercial bank or import/export agencies. This though contradicts the findings of Alleyne et al (2017) which intimate that imports should have declined. However, it is in line with Collin, Cook, and Soramäki (2016) who find no consistent evidence that grey-listing impacts trade, though the various iterations of their model suggest that imports are more likely to be affected.

As an alternative, the equation is re-ordered to assess whether the availability of trade financing was affected by de-risking. By placing the trade financing variable as the determinant finds that de-risking had a significant and positive effect on trade financing (Table 5). The positive relationship may be indicative of the fears of suppliers that they may not be able to be paid. It may also be reflective of the decline in the availability or use of letters of credit from Caribbean commercial banks to facilitate the trading relationships. In Mahabir and Rahaman (2016) the data examined suggested a complementary relationship: as letters of credit from Trinidad and Tobago commercial banks fell; there was an increase in the value of short-term credit from the Berne Union members.

Table 5: Results for Impact of De-risking on Short-Term Credit Exposure

	Lnshortterm credit	Lnshortterm credit (-1)	Lnshortterm credit
Limports	0.894***	0.903***	
Limports(+1)			0.903***
Lex	0.190***	0.194***	0.193***
Lcpi	0.001	-0.009	0.014
Lqgdp	0.007	-0.016	-0.016
Derisking	0.545***	0.539***	0.538***
cons	-0.603***	-0.665	-0.665
No. of obs	621	609	610
Log likelihood	-467.5657	-460.5647	-462.6304

* p<.05; ** p<.01; *** p<.001

The equations confirm that there is a positive relationship between import and trade financing. Of the two sub-components of the REER, only the changes in the exchange rate is significant. The figures suggest that more flexible exchange rate regimes are associated with higher levels of trade financing. This is not surprising as with flexible exchange rates traders would have to mitigate against exchange rate risk. The relationship between economic growth and trade financing is not a significant one.

4. Data, Methodology and Results– Remittances

There is a vast literature on remittances, with much of the focus being on the demand, determinants and volatility of remittances and the impact of remittances on financial development and economic growth. The literature can also be divided into those studies that look at the macroeconomic determinants of remittance and those that look at the microeconomic factors. Usually, the focus is on the inward flow of remittances. The typical equations investigating remittance flows include variables such as GDP growth, migrant stock, and exchange rates. Other variables can include real interest rate differential, and institutional factors such as political stability. In cases where more detailed information about the migrants is available, characteristics of the migrants can be included such as education level/skill level, age of migrants, first- or second-generation migrants and country of origin.

To assess the impact of de-risking on remittances the following equation is estimated. The impact on both inflows and outflows are examined.

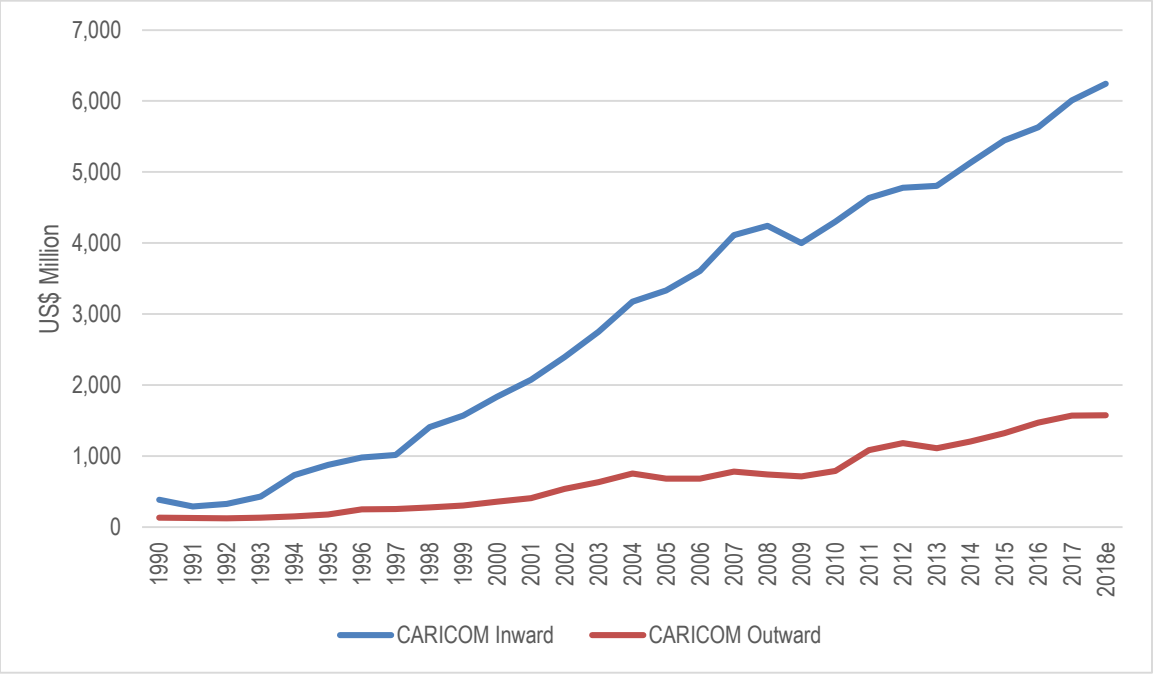
$$\log(R_t) = \beta_0 + \beta_1 \log(USGDP_t) + \beta_2 \log(GDP_t) + \beta_3 \log\left(MigrantStock_{t)}\right) + \beta_4 Z_t + \varepsilon_t \qquad (3)$$

Where:
R represents remittance flows
USGDP represents the Gross Domestic Product of the United States
GDP represents the Gross Domestic Product of the Caribbean country
Migrant Stock represents the number of migrants in a county
Z takes into account other variables

Remittance data was obtained from the World Bank remittances database (in cases where data was missing the closest available data point was repeated or where available taken from the country specific databases), GDP was taken from the IMF World Economic Outlook database and migrant stock is obtained from the UN database – with a simple linear extrapolation for missing years. The US GDP is used as a proxy for the state of the global economy since the US is the main country of residence for many Caribbean migrants (in an alternative iteration the UK GDP is used). Other variables are also included such as inflation and exchange rate. Information on inflation and exchange rate are also sourced from the IMF database. To measure the impact that de-risking has had on remittance flows a dummy variable is utilised.

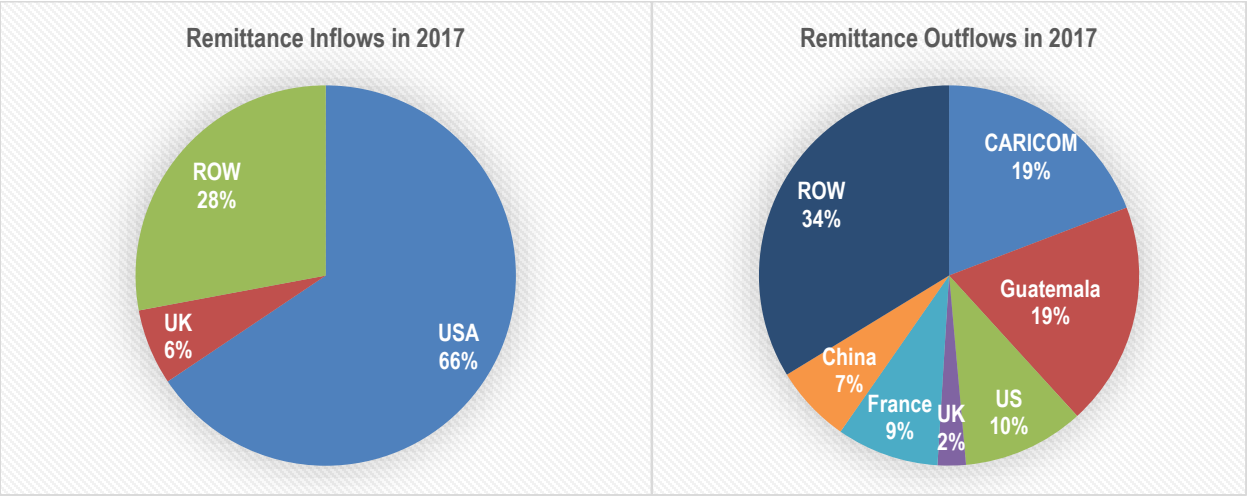
Remittances both into and out of the Caribbean have continued to trend upwards over the last three decades (Chart 3). Generally, Jamaica and Haiti receive over 80 per cent of the remittances to the Caribbean. This is not surprising as Haiti and Jamaica have the largest number of outward migrants; both are estimated to have over 1 million of their citizens living in another country. Jamaica, Haiti, The Bahamas and Trinidad and Tobago account for most of the outward remittances. Trinidad and Tobago, Belize and The Bahamas appear to have the most foreign-born population, accounting for around 50 thousand persons each.

Chart 3: CARICOM Remittances: 1990-2018 (US$ Million)



Source: World Bank Remittances Database – July 2019.

Chart 4: Direction of CARICOM Remittances: Inflows and Outflows in 2017 (US$ Million)



Source: World Bank Remittances Database – July 2019.

Many of the countries in the Caribbean region have traditionally had a negative migration rate, i.e. the number of outward migrants is higher than the number of inward migrants (2019 may be an exception to this for countries such as Guyana and Trinidad and Tobago given the large inflows of Venezuelan migrants). Traditionally the outward migrants have largely emigrated to the US and the UK. Inward migrants tend to be from other Caribbean countries, as well as China in recent years. The dataset is yearly from 1990-2018. Notably, The Bahamas has no data for outward remittances. The summary statistics are the table below.

Table 6: Summary Statistics - Remittances

Variable	Mean	Std. Dev	Min	Max
GDP (US$ millions)	3713.84	5,134.39	201.00	28,233.00
Population (millions)	1.12	2.34	0.04	11.12
Total Foreign-born (millions)	0.23	0.02	0.003	0.06
Total outward migrants (millions)	0.23	0.31	0.02	1.30
US GDP (US$ millions)	1.24e+07	4,318,850	5,963,215	2.05e+07
Average Inflation (%)	6.56	12.72	-3.079	142.841
Inward remittance flows (US$ millions)	236.39	542.69	0.20	2,985.86
Outward remittance flows (US$ millions)	49.14	85.78	0.00	424.56

The variables were transformed into their log form and were tested for unit roots. All were found to be stationary. In traditional panel models fixed or random effects are utilised. Using the Hausman test finds that for both inward remittances and outward remittances the random effect model is the best fit. Given the data there is likely to be serial correlation, and indeed tests suggest the presence of this feature. To take into account serial correlation in the panel data the feasible GLS panel model was also estimated. A priori it is expected that de-risking would have a significant and negative impact on remittance flows.

Table7: Results for Impact of De-risking on Remittances

	Random effects		Panel Feasible GLS					
	In in remittances	Ln out remittances	In in remittances	Ln out remittances	In in remittances	Ln out remittances	In in remittances	Ln out remittances
Ln GDP	0.669	0.655	0.616***	0.955***	0.600***	0.983***	0.631***	0.962***
Ln Population	-1.044	0.596	1.332***	0.499***	1.315***	0.533***	1.282***	0.487***
Ln Total Foreign born	0.628	-0.096	-0.950***	-0.069	-0.931***	-0.116	-0.935***	-0.067
Ln Total outward migrants	1.925*	-0.201	-0.763***	-0.246	-0.737***	-0.259	-0.707***	-0.237
Ln US GDP	0.619	0.303	1.468***	-0.056	1.449***	0.005		
Ln UK GDP							1.360***	-0.103
Average Inflation (%)	-0.015***	-0.008	-0.033***	-0.007	-0.032***	-0.008	-0.034***	-0.008
Exchange rate					-0.001	0.002*		
De-risking	-0.233*	1.280*	-0.339	1.268***	-0.331	1.244***	-0.013	1.268***
Cons	-1.064	-7.578	-28.441***	-4.084	-27..902***	-5.536	-24.329***	-3.259***
No of Obs	377	399	377	399	377	399	377	399
Log likelihood			-587.3236	-635.1587	-587.1088	-632.9795	-589.7953	-635.0875
R2 (overall)	0.2858	0.6373						

* p<.05; ** p<.01; *** p<.001

Robust standard errors are reported for the random effects model

The results indicate that de-risking had a significant effect for outward remittances and an insignificant one for inward remittances[5]. In the case of inward remittance, there was a negative effect. It may have been the case that foreign money transfer organizations were unwilling to send funds to countries that are deemed high-risk, perhaps in an effort to avoid potential fines. El Taraboulsi-McCarthy (2018) notes in 2013/2014 several UK and US commercial banks closed the accounts of Somali money transfer operators. Another possible explanation is that fees for the transfer of such funds may have been increased. An examination of the World Bank's Remittances Prices Database illustrated that in Jamaica, Haiti and Guyana, after a decline in fees during 2014 and 2015, there was an increase in the cost of sending remittances to these Caribbean countries from Q1 2016. However, by 2019 the prices began to decline once more. The insignificant effect of de-risking on inward remittances may point to some resilience of these flows in times of volatility. Moore and Greenidge (2008) found that there was a high level of persistence in remittance inflows to the Caribbean. Their findings suggest that countries would typically receive at least 78 per cent of the remittances inflows from the previous year. Only in three iterations (out of 20) do Collin, Cook, and Soramäki (2016) find that grey-listing significantly impacted remittances. It should be noted that while at the macro level the variable was insignificant, for households dependent on foreign financial assistance any fall in remittances is likely to have a substantial impact on their wellbeing.

The relationship between de-risking and outward remittances was positive. One possible explanation is that persons took the opportunity to deposit funds in foreign financial institutions, via relatives abroad, to avoid the effects of de-risking; alternatively they could have sent increasing volumes of money to family abroad in anticipation of de-risking. It may be that persons in the Caribbean countries were much more aware of the developments in the financial space and thus took immediate measures to mitigate the effects. Many of the Caribbean central banks[6] and the regional media highlighted the de-risking issue in 2016/2017 which would have led to heightened awareness of the problem by the general population. Another possible explanation is that business segments which were de-risked by commercial banks, for example casinos, were forced to find financial institutions in other countries that were willing to accept their funds and/or other means for moving their funds internationally. Collin, Cook, and Soramäki (2016) found that countries that were grey-listed were no less (and possible more) likely to send cross-border payments to other countries. Gordon (2019) noted that cambios in Jamaica were forced to move funds outside the formal sector. Media reports suggest that during the height of de-risking in the Caribbean some MTOs resorted to physically transporting foreign currency from one jurisdiction to another.

Depending on the direction of remittance flow, the state of the domestic or international economy (proxied by the US GDP) was an important factor in the determination of remittance flows. Not surprisingly global economic growth significantly improved the flow of remittances to the Caribbean countries. For outward remittances, domestic economic activity was a stronger factor. This is consistent with the remittance literature. The UK is also home to a large percentage of migrants from the Caribbean; using that country's GDP as an alternative to the US's GDP finds no significant alteration to the results.

The size of migrant stocks – either the number of foreign-born residents in the respective Caribbean countries or the size of the outward migrant stock – had an insignificant impact on the size of remittances sent abroad, while having a

[5] Using panel-corrected standard error (PCSE) estimates the de-risking variable becomes significant for inward remittances in the original equation as well as the equation including the exchange rate. The sign and size of the coefficient remain the same.
[6] For example the Central Bank of Barbados had a webpage devoted to de-risking.

significant though negative impact on inward remittances[7],[8]. Sampson and Branch-Vital (2013) in looking at remittance flows from the US to the Caribbean recognized that the various categories of migrants (legal "immigrants admitted", the "persons naturalized" and the "non-immigrants admitted as temporary workers, exchange visitors and intra-company transferees") can have different impacts on remittance flows. In addition, the remittance literature summarised in Kumar, Hossain, and Osmani (2018) identifies that there are different motives for sending remittances which can affect these flows.

Inflation was occasionally an important factor in remittance flows though the overall impact was small. Other iterations of the model indicate that the exchange rate had a small or insignificant impact on remittance flows. This may be reflective of the fixed exchange rates of several of the CARICOM countries. Other studies on remittances have also found similar relationships between remittances and macroeconomic variables as illustrated in the literature review in Mouhoud *et al* (2008). Tabit and Moussir (2016) found from a panel of 22 developing countries, that migrant stock and the official exchange rate did not have a significant influence on remittance inflows. In contrast they found that inflation had a positive and significant impact.

5. Conclusions and Policy Recommendations

This paper quantifies the implications of de-risking on the Caribbean islands. The analysis finds that for both trade financing and outward remittances de-risking had a significant impact. De-risking resulted in foreign firms increasing their insurance in case of non-payments. An increase in outward remittances was also associated with de-risking.

In the case of trade financing, the investigations suggest a need for the development of a more comprehensive database on trade financing inclusive of not only the Berne Union members but also letters of credit from commercial banks and supplier credit. Information on the costs of such services is also needed. Van Wersch (2019) also recognised such a need and has proposed a framework for the establishment of such a database. Secondly, there is a need for quarterly GDP figures to enable assessment of countries where the database timespan is limited.

The increase in the demand for Berne Union financing suggests that foreign exporters are concerned about the receipt of payments from their Caribbean partners. Policymakers should ensure that domestic import/export institutions are meeting the needs of the local businesses.

For both remittances and trade financing, the developments in blockchain technology have the potential to assist. For trade financing, it has been suggested that through the implementation of smart contracts, the reduced need for correspondent banks, real-time tracking of shipments and transparency of documents can lead to lower costs and more time-efficient services. For remittances, blockchain technology offers a faster transmission time with lower costs. Internationally there has been experimentation with the use of this technology with remittances receiving the majority of attention. The Caribbean region is now seeking to understand the potential benefits.

[7] Alternative versions of the model were estimated using levels instead of logs. In these cases, for the flow of inward remittances there was a negative and significant relationship with the stock of migrants in the country, and a positive and significant one with the stock of migrants living outside the country – in this version de-risking was positive but not significant. For outward remittance flows, there was a negative but significant relationship with the stock of migrants in the country and a positive and significant effect with the stock of migrants living outside the country – de-risking was positive and significant.

[8] Re-running the equations with only one of these two variables did not significantly affect either the signs or the level of significance.

One possible consequence of de-risking is moving cash flows into less regulated areas (when compared to commercial banks) such as MTOs. Authorities would need to ensure that MTOs are compliant with similar regulations as commercial banks when it comes to know your customers and anti-money laundering issues.

While the noise surrounding de-risking has diminished in the last year the effects are still being felt. At the same time new and unforeseen financial regulations by international bodies are being proposed and implemented. The Caribbean financial sector supervisors are constantly having to play "catch up" in order to avoid or exit a "black" or "grey" list. Financial institutions have to adapt to existing international standards such as those in Basel III which can impact trade financing and AML/CFT rules that can affect the availability of remittance services. At the same time, international bodies are continuing to draft and develop new measures. As this paper indicates the implementation of these financial developments can have a real impact on businesses and individuals. Greater representation of the Caribbean and other similarly affected economies is needed in the global sphere. A balance needs to be struck between the need for greater regulation to mitigate risks and any negative economic impact that such regulations would incur.

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Appendix 1: CARICOM Demand for Trade Financing

	Country	Survey Year	No. of firms surveyed	Savings or Checking Account (%)	Bank Loan or Line of Credit (%)	Access to Finance as a major constraint (%)
1	Antigua and Barbuda	2010	151	100.0	49.2	58.4
2	Bahamas	2010	150	97.6	34.2	21.8
3	Barbados	2010	150	97.4	58.2	21.9
4	Belize	2010	150	100.0	43.9	44.6
5	Dominica	2010	150	100.0	32.8	17.5
6	Grenada	2010	153	98.7	49.0	19.7
7	Guyana	2010	165	100.0	50.5	24.6
8	Jamaica	2010	376	99.8	27.2	14.9
9	St. Kitts and Nevis	2010	150	100.0	49.3	28.0
10	St. Lucia	2010	150	100.0	24.5	21.3
11	St. Vincent and the Grenadines	2010	154	98.6	56.5	22.3
12	Suriname	2018	233	93.5	36.6	12.7
13	Trinidad and Tobago	2010	370	99.9	53.7	12.9
	Average			**98.9**	**43.5**	**24.7**

Source: World Bank Enterprise Survey Database

Appendix 2: Determinants of Trade Financing: Diagnostic Test Results

Country	Specification Test				Goodness to Fit Test				Multicollin		
	Wald Test				H-L test				Variance Inf		
	TF1	TF2	TF3	TF4	TF1	TF2	TF3	TF4	TF1	TF2	TI
Antigua and Barbuda			X	X			✓	✓			
Bahamas			X	X			✓	✓			
Barbados			✓	X			✓	✓			
Belize			✓	✓			✓	✓			
Dominica			X	X			✓	✓			
Grenada			✓	X			✓	✓			
Guyana			✓	✓			✓	✓			
Jamaica	✓ ✓	✓	✓	X	✓	✓	✓	X	✓	✓	
St. Kitts and Nevis			✓	✓			✓	✓			
St. Lucia			✓	✓			✓	✓			
St. Vincent and the Grenadines			✓	✓			✓	✓			
Suriname			✓	✓			✓	✓	✓	✓	
Trinidad and Tobago	X	✓	✓	✓	✓	✓	✓	X	✓	✓	
CARICOM	✓ ✓	✓	✓	✓	✓	✓	X	✓	✓	✓	

Appendix 3: Individual Results for Probit Modelling.

Antigua and Barbuda

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			-0.00361	-0.00400
Age^2			0.00006	0.00008
Size			-0.00068	-0.00116
Gender			-0.08516	-0.09848
Manufacturing			0.22947	0.00889
Services			0.22847	0.01930

Bahamas

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			0.00722	-0.00037
Age^2			-0.00010	0.00000
Size			0.00017	0.00008
Gender			-0.12902	0.00822
Manufacturing			0.22875	-0.14611
Services			0.12262	-0.15312

Belize

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			-0.00569	-0.01206
Age^2			0.00007	0.00014
Size			0.00029	0.00339
Gender			-0.06673	-0.12767
Manufacturing			0.28028	0.05064
Services			0.27608	0.02330

Barbados

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			0.00016	0.00585
Age^2			0.00000	0.00003
Size			0.00059	0.00035
Gender			0.08144	0.02877
Manufacturing			0.24721	-0.20251
Services			0.07960	-0.00347

Dominica

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			0.00394	-0.01343
Age^2			-0.00009	0.00021
Size			-0.00054	0.01451
Gender			0.21503	0.05691
Manufacturing			0.26488	-0.22932
Services			0.10812	-0.23645

Grenada

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			0.00074	0.00178
Age^2			-0.00001	-0.00001
Size			0.00059	0.00156
Gender			0.02972	-0.03279
Manufacturing			0.25310	0.05931
Services			0.18554	-0.11166

Guyana

			Supplier paid after delivery	Line of Credit
Age			0.00416	-0.00620
Age^2			-0.00001	0.00006
Size			0.00020	0.00037
Gender			0.12154	0.02601
Manufacturing			0.12316	0.04060
Services			0.09717	0.06468

Jamaica

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age	-0.00146	0.00446	0.00228	-0.00348
Age^2	0.00000	-0.00001	-0.00001	0.00001
Size	-0.00004	0.00020	0.00001	0.00021
Gender	0.18010	0.06393	0.10860	-0.05172
Manufacturing	0.34780	-0.04762	0.09099	-0.01834
Services	0.28278	0.00463	-0.02582	-0.21526

St. Kitts and Nevis

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			0.00079	0.00535
Age^2			0.00006	-0.00006
Size			-0.00015	-0.00010
Gender			-0.02216	-0.00007
Manufacturing			0.12125	-0.16550
Services			0.21305	-0.05171

St. Lucia

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			-0.00186	-0.00957
Age^2			0.00002	0.00013
Size			0.00035	0.00351
Gender			-0.01533	-0.05100
Manufacturing			0.18484	-0.00441
Services			0.21320	-0.21637

St. Vincent and the Grenadines

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age			0.00048	0.01969
Age^2			0.00002	-0.00029
Size			0.00102	0.00023
Gender			0.07939	-0.17284
Manufacturing			0.21221	-0.12685
Services			-0.03627	-0.08439

Suriname

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age				-0.00338
Age^2				0.00000
Size				0.00166
Gender				-0.08252
Manufacturing				-0.07852
Services				-0.12769

Trinidad and Tobago

	Supplier paid before delivery	Supplier paid on delivery	Supplier paid after delivery	Line of Credit
Age	0.00173	0.00803	0.00994	0.00550
Age^2	-0.00001	-0.00007	-0.00008	-0.00004
Size	-0.00042	0.00062	0.00095	-0.00011
Gender	0.01397	-0.04642	-0.01654	-0.01139
Manufacturing	0.05126	0.09986	-0.04281	-0.00102
Services	-0.06048	0.04943	-0.09260	0.00212