FULL COLOUR THINKING

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The Impact of Remittances on GDP in CARICOM

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ABSTRACT

This study investigates the relationship between remittances and economic growth in the Caribbean Community (CARICOM) from 1975 to 2013, where remittances are measured as a share of GDP and economic growth is measured by GDP per capita growth.

Using multivariate linear regression analysis and the Generalised Method of Moments (GMM) the researcher tested the hypothesis that remittances have a positive relationship on GDP per capita growth within CARICOM. Additionally, the ability of financial development to influence the relationship between remittances and GDP per capita growth was also tested. In this study financial development was measured using the proxy variables of quasi money, M2 and banking credit to the private sector.

The relationship between remittances and economic growth has been shown to vary across countries and regions. In this study it was found that remittances as a share of GDP growth do not have an overall statistically significant influence on GDP per capita growth but do effect GDP per capita growth through their interactions with inflation and banking credit to the private sector.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

GLOSSARY OF TERMS

CARICOM	Caribbean Community and Common Market
LAC	Latin America and the Caribbean
SIDs	Small Islands Developing States
NBFIs	Not Banking Financial Institutions
SSA	Sub Saharan Africa
OECD	Organisation for Economic Co-operation and Development
MSEs	Micro and Small Sized Enterprises
SMEs	Small and Medium Sized Enterprises
WDI	World Development Indicators

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1 INTRODUCTION

1.1 Research Area

According to the World Bank (2014) personal remittances are made up of two components: personal transfers and compensation of employees. Personal transfers include transactions between resident and non-resident individuals and consist of cash transfers and goods in kind. Compensation of employees captures transmitted funds which originate from migrants who engage in seasonal or short-term employment in countries where that are not residents. These employee transfers may include wages and salaries in cash, wages and salaries in kind and employee's social contributions.

The potential of remittances to be a source of development finance has increasingly become the focus of national policymakers and multilateral development agencies within the last decade. Remittances have been shown to be a reliable source of income for households particularly following natural disasters and during financial crises. For many developing countries remittances inflows are on par or have exceeded Foreign Direct Investment (FDI) and Official Development Assistance. This strengthens the argument that remittances should be viewed as an untapped capital source for many developing countries.

At the micro-level remittances have been used by households to ease borrowing constraints, facilitate consumption smoothing and investment activity, and for the improvement of access to education and healthcare. Due to these positive consequences, significant efforts are being made to understand the nature of remittance flows and how they are utilised in the recipient countries.

Even though evidence has shown that the financial crises in 2008 resulted in some traditional migratory the reality remains that migration is a natural facet of human existence, and new south-south migration corridors have begun to open and are already in existence. Figures published by Ratha (2009) show that nearly half of the migrants from developing countries reside in other developing countries. While at the household level there seems to be no doubt as to the benefits of migrant's remittances, at the macro-level the impact of remittances on national economies is far less clear and widely debated in the literature. The most insightful conclusion is the fact that at the macroeconomic level remittances are only as useful as the institutional and financial systems that receive them. There is no consensus on whether remittances are beneficial for economic growth as measured by a country's Gross Domestic

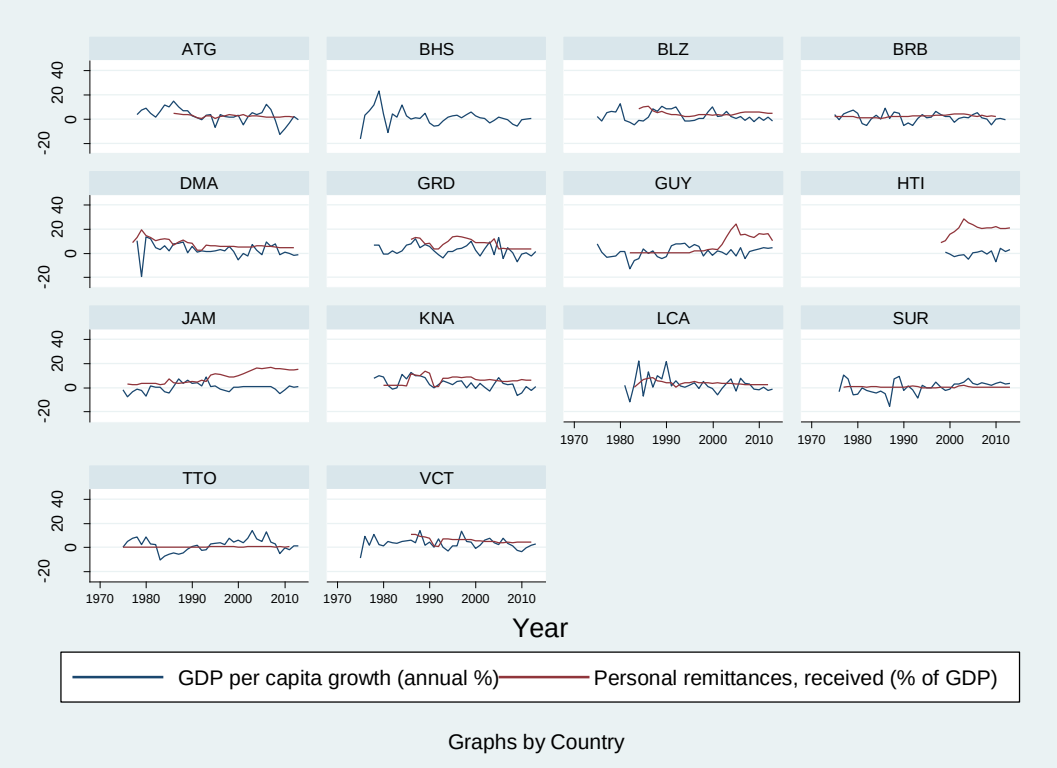
Product (GDP).It has been show that economic impact of remittances inflow vary between developed and developing countries and within groupings of developing countries There is therefore a need to investigate the relationship between remittances and financial development also taking into consideration the role of national regulatory institutions and existing legal frameworks.

1.2 Problem Statement

For some developing countries an accurate assessment of the impact of remittances on economic growth cannot be made until remittances inflows to that specific region or country have been analysed within a framework that is relevant to that locality. Although analyses on remittances have been done for the Latin American and Caribbean (LAC) region (Acosta, 2007), these analyses often only include the Caribbean countries most dependent on remittances, usually Guyana, Jamaica and Haiti[1]. In 2013 personal remittances to all three of these countries as a share of GDP was over 10% and the regional average excluding these three countries was only 3.5%[2] remittances as a share of GDP. However, these countries exist within a highly interdependent regional bloc. In 2009 Jamaica was the largest intra-regional importer accounting for 34.3% of intraregional trade while the region relies heavily on rice exports from Guyana (CARICOM Secretariat, 2013,p.10). Furthermore the CARICOM Secretariat (2013,p.9) states that trade in goods and services is the main driver of economic activity in the Caribbean region and most CARICOM member states have trade to GDP ratios in excess of 100%. Therefore to only use the experiences of Jamaica, Guyana and Haiti to make generalisations about the relationship between remittances and economic growth is to fall short in providing a true picture of what may be occurring on a regional scale. **Figure *1*** shows the movements of GDP per capita growth and remittances in CARICOM from 1975 to 2013.To what extent remittances inflows are correlated with GDP growth in the Caribbean basin, and more specifically the Caribbean Common Market remains to be known.

[1]As determined by the ratio of remittances to GDP
[2] Author's own calculations based on WDI data.

Figure 1: CARICOM trends in GDP per capita growth and remittances



Source: Tables generated by author using the World Bank's WDI.

1.3 Purpose and Significance of the Research

While Interregional migration has oftentimes receives the greater focus, intraregional migration has consistently been taking place, the organic efforts of a regions to integrate culturally and economically. Although formal efforts at integration failed in the past, the harmonization of economic policies, particularly those relating to trade and finance , is increasingly being recognized as necessary for the survival of the region.

In 1972 The Caribbean Community and Common Market (CARICOM) was created with the signing of The Treaty of Chaguaramas, its goals were :

"to improve standards of living and work; the full employment of labour and other factors of production; accelerated, coordinated and sustained economic development and convergence; expansion of trade and economic relations with third States; enhanced levels of international competitiveness; organisation for increased production and productivity; achievement of a greater measure of economic leverage and effectiveness of Member States in dealing with third States, groups of States and entities

of any description and the enhanced co-ordination of Member States' foreign and foreign economic policies and enhanced functional co-operation."

Article 6, The Revised Treaty of Chaguaramas

In 1989 CARICOM heads of government met to transform the Caribbean common market into a single market that would facilitate intraregional trade and investment.. The Caribbean Single Market and Economy (CSME) has made provisions for the free flow of skilled persons and capital and is laying the foundations for what is hoped will be a monetary union between member states. For Brewster (2003) The Revised Treaty of Chaguaramas requires not only unified economic and monetary policies but a currency union. Among the countries in CARICOM there is a vast disparity in the level of remittances inflows. If these inflows can be shown to have a tangible effect on the economic growth of the receiving countries then remittances to CARICOM have the potential to impact on the national income disparities between member countries. The rate at which such disparities are reduced is often referred to as economic convergence. The concept of convergence arises from an economics theoretical framework which suggests that poor countries should grow faster than rich ones because they are able to experience greater returns to capital than their richer counterparts (United Nations, 2009) .This has implications for the depth of regional integration that can be achieved since convergence is one of the main perquisites for monetary and currency unions. The liberalization of trade policies and the freedom of movement for the factors of production: mainly labour and capital is one way of trying to achieve convergence within a region. There are already many questions and theories surrounding how and whether such agreements can achieve convergence, all of which relate to countries' ability to generate intraregional trade. The countries making up CARICOM differ widely in their drivers of growth, and in the size of their remittances flows relative to GDP. It is possible that remittances flows into individual countries within the region could be just as important in determining the potential convergence of GDP growth within in the region as their capabilities for manufacturing tradable goods and services.

Within this context I believe that the study of remittances and their impact on growth within CARICOM is relevant for determining how these capital flows can be harnessed or channelled for regional development.

The role being played by remittances in the region should be given greater attention by policymakers.. Remittances are often used to meet immediate or short run expenses in receiving households but are also used to invest in longer-term assets such as property and for establishing

micro and small sized enterprises (MSEs). The investment potential of remittances represent another avenue that may be targeted in order to facilitate growth.

This paper seeks to motivate the need for a more in depth analysis of remittances in CARICOM and how these capital flows may be used to stimulate growth and development at the national and regional level. The role of remittances at the regional level is of particular interest considering how the population of CARICOM nationals residing outside of the region represent a collective Caribbean diaspora. They share a common culture and identity and as a group can be targeted and encouraged to make a broader spectrum of investments in their home country. This supports The World Bank's (2013) suggestion that any attempt to develop policies addressing the challenges and opportunities presented by remittances must be done at the regional level.

1.4 Research Questions and Scope

Considering the mixed outcomes in the discussion on how remittances may impact economic growth through their influence on GDP this paper raises the question of how might these capital inflows be impacting on economic growth in CARICOM.

There have been many arguments put forward regarding the potential scope of harnessing the diaspora. CARICOM migrants, specifically the large established communities in North America and the U.K provide the opportunity for nostalgic trade; the term used to describe the demand and supply of indigenous goods from the Caribbean region to migrant host countries (Hosein et al, n.d). Diaspora communities also represent potential investors in the region through diaspora tourism (Mitjáns, n.d.) Diaspora bonds (Rambarran, 2011) and investments in the region's entrepreneurs (Hosein, n.d)(World Bank, 2013).

As remittances start to be viewed as potentially new sources of investment, policy makers will have to take a critical look at the region's financial systems and institutions. Examining the capacity of the region's financial institutions and regulatory environment (World Bank, 2013)leads to a more realistic expectation of what remittances can and cannot do given the current financial and regulatory frameworks within the region.

This paper seeks to establish whether there is a significant positive relationship between remittances and GDP per capita growth in CARICOM. Furthermore, it will also establish

whether the role of financial institutions is relevant in explaining how remittances are correlated to economic growth.

2 LITERATURE REVIEW

Remittances received from migrants abroad are one the largest sources of external finance for developing countries (Ratha, 2007).Remittances have shown themselves to be a persistent and reliable capital flow for developing countries. Ratha (2007) states that from 2002 -2007 there was a doubling of remittances while Ratha et.al (2012) shows us that during the financial crisis in 2008 and 2009 remittances remained a steady flow of capital, at a time when ODA had decreased. These observed effects were a result of the improved measurement of remittance flows, a reduction in the costs of remitting and expanding networks in money transfers, a depreciation of the US dollar and growth in migrant stock and incomes. Remittances have become a new frontier for policymakers in developing countries and although there has been a mixed consensus on their benefits to economic growth, remittances have been shown to have a positive impact on the social indicators of development; having beneficial impacts on educational attainment, gender equality and access to healthcare (Ratha D. a., 2007) (Ratha R. , 2013).

The impact of remittances on growth cannot be assumed to be consistent for any specific country grouping. Regarding the impact of remittances on economic growth a select number of CARICOM countries have been included for analysis under the Latin America and the Caribbean (LAC) region but given the disparities in the findings on remittances and growth it should not be assumed that what is evidence in mainland Latin America will also be evident for this group of Caribbean countries. Therefore this paper seeks to investigate the relationship between remittances and growth in CARICOM, a topic that is made even more relevant considering the regional and global attention being paid to regional trading blocs and currency unions.

The empirical analysis needs to be located in a theoretical understanding of how remittances can effect economic growth. There are a number of channels through which

remittance inflows can affect growth, the dominance of one effect over the other will determine whether remittances will have a positive or negative effect or whether these effects may counteract each other therefore rendering remittances and insignificant driver of economic growth as measured by changes in GDP and GDP per capita.

In the literature there is no comprehensive review of remittances for the Caribbean region that relies on an examination of the different mechanisms through which remittances affect economic growth. Therefore this literature review will depend on the research findings from studies using developing country samples, small open economies, SIDS and wherever possible country specific studies from CARICOM member states.

The review of the literature will commence with a brief overview of what motivates migrants to send money back to their countries of origin. These choices determine the magnitude, frequency and way in which remittances are used by the individuals who use them. To address the first research hypothesis that remittances are having a positive influence on GDP per capita growth in the region there will be an examination of the global findings on the relationship between remittances and growth and then a discussion on the channels through which remittances have been known to effect economic growth through other macroeconomic variables and the institutional framework of receiving countries.

The second research hypothesis asserts that financial development within CARICOM itself determines whether remittances have an influence on economic growth as defined by GDP per capita growth. To accomplish this there will be a section dedicated to the overview of the state of financial development in CARICOM and the type of institutions that dominate the financial sector in the region. Although the region's financial sector can be praised for its success in some countries, and certainly relative to other developing country groupings, it is still constrained in the financial services and products offered. It is even more deficient if financial sector development is defined to include the efficiency and effectiveness of the region's stock markets. Indeed, it is hoped that in conjunction with this review the empirical analysis will aid in drawing attention to the importance of possessing financial systems and institutions that are able to facilitate remittances as a source of development and entrepreneurial finance.

The focus has been on the potential of remittances to act as a source of development finance. However, for middle to upper income developing countries in CARICOM the hurdle is not so much the need for development finance that addresses deficiencies in human development indicators but for financing that encourages innovation in entrepreneurship and facilitates the expansion of Caribbean business into extra-regional markets.

This literature review supports the view that in order to accurately develop arguments or policies for the use of remittances in national development, there must be an understanding of how remittances may already be influencing growth through micro and macroeconomic channels. Attempts to exploit the reliability of remittances as a stream of capital flows should be designed to, further exploit an existing growth channel, mitigate any negative effect of remittances on GDP or employ a combination of the two strategies.

The Nature of Remittances

The empirical outcomes for remittances impacting economic growth vary as a result of how these remittances are used within the selected sample countries. To arrive at an accurate conclusion of this impact requires analysis at the macroeconomic and microeconomic levels. Many of the studies seeking to investigate this relationship between remittances and economic growth draw on broad samples of developing countries and while they benefit from having a larger sample size for data analysis, the relevance to developing countries is lost by failing to account for how remittances are spent within subsets of these countries (Funkhouser, 1995).

These differentials between countries and regions are a result of two issues relating to remittances: the motivation for migrants to send money home and how remittances are spent by recipient households. When reviewing the literature on remittances and growth it is useful to contextualize the findings, taking into consideration the ways in which consumption and investment behaviour may differ across cultures and localities.

Motivations to Remit

Existing theories have tried to explain migrants' motivations to send remittances to their country of origin in terms of migrant altruism and self-interest.

According to Grigorian and Melkonyan(2008) migrants motivated by self-interest are more likely to send money to households that are wealthier than their altruistic counterparts. Alternatively, altruistic remitters are more likely to support poorer households. Rapoport and Docquier(2005) explains this phenomena by arguing that self -motivated remitters send money home with the intention of maintaining useful connections which will benefit them when they return home at a later date. Additionally the money sent home by these individuals is more likely to be earmarked for productive investments that will again be beneficial to them upon their return home. These motivations to remit play an important role in explaining the

relationship between remittances flows and economic growth. While other capital flows are known to respond negatively to a downturn in economic conditions in the receiving country, remittances inflows have been shown to be unchanged by downward trends in the business cycle (Ratha D, 2007b). The self-interested migrant, may be ideal for taking advantage of the investment potential of remittances but it is the altruistic migrant that will help to account for the counter-cyclical flow attributed to remittances (Ghosh, 2006).These two categories of remitters represent the two ends of the spectrum and in reality migrants who send transmit money to their native country will be motivated by a combination of self-interest and altruism. Data for the CARICOM member states shows that remittances are relatively stable compared to GDP/capita growth, with the most notable increases occurring in the wake of natural disasters. This suggests that remittances to CARICOM are more of the altruistic kind, consistent with the findings of Amuedo-Dorantes and Pozo (2007) who linked altruism to the stability of remittances in SIDS. . The implications of this are valuable for developing an understanding of how remittances might be impacting growth within the region. If CARICOM's international migrant stock is in fact dominated by altruistic remitters then remittances to the region represent a stable and reliable source of capital for investment initiatives.

Chami et al (2013) opines that what is good for the household might not be good for the overall economy. Altruistic remittances, transmitted without a spoken or unspoken agreement between sender and receiver have a greater likelihood of being used to increase household consumption rather than fuelling long-term income generating activities. This has been used to explain the negative dynamic effects of remittances on growth in small open countries (Ahortor and Adenutsi, 2008). For small open economies this can in fact become a negative side effect of remittances inflows.,

Remittances and Growth

Over all the literature is inconclusive on the effects that remittances have on economic growth. Barajas et.al (2009) asserts that the remittance data being utilized is not sufficient in size or nature to provide an accurate picture of how these capital flows have affected the long term economic growth of their recipient countries. Using panel growth regression the author conducted a study of 84 developing countries using data from 1970-2004 and found that remittances had no impact on economic growth. However this study admittedly uses an approach that departs from those used in many of the other empirical studies that seek to prove correlation and causality between remittances and economic growth. Barajas et al (2009) claims that the difficulty in arriving at a valid conclusion regarding the impact of remittances

on economic growth is due to the failure of most empirical studies to address endogenity in the models used. A number of studies utilize the ratio of remittances to GDP as the instrument to measure remittance flows. The factors which are likely to cause a surge in remittances are also factors likely to cause increases in economic growth and to address this the authors sought to isolate the microeconomic determinants of remittances .i.e the transactions costs of remittances. As a proxy for this a ratio of remittances to remittances of all other remittance receiving countries was used, relying on the assumption that any movements in remittance flows are resulting from transaction costs fluctuations and not conditions that simultaneously increase remittances and spur economic growth. Nonetheless this study remains one of the many in the inconclusive debate of the power of remittances to impact on economic growth, with the authors acknowledging the many avenues through which remittances may possibly impact economic growth positively and negatively, even cancelling each other out.

Using panel data Pradhan et.al(2008) conducted a study of 39 developing countries for the year 1980-2004 and found that remittances had a significant impact on per capita economic growth. However, the writers also suggests that the impact of remittances on GDP growth is ambiguous. Katsuhi et. al (2012) determine that remittances are positively associated with better economic performance for their sample of 24 Asia & Pacific countries and Fayissa and Nsiah (2010) also concluded that remittances have a positive impact on economic growth in their sample of Latin American countries. Contrasting their results with the findings of Barajas et al (2009), they suggests that focusing on only Asian countries and using more recent data may have been the reason for the different result but hints that the lack of a positive relationship outlined in some studies is suspect. While the body of empirical work surrounding the relationship between remittances and economic growth is being built up the debate relies on an understanding of the channels through which remittances can impact economic growth and ultimately which of these channels is dominant in a particular region, country or stage of development. Remittances are viewed through a number of lenses: social, political economy and financial; through which they have a potential of generating a negative and positive impact on a country's economic growth

For small open economies remittances are more likely to be beneficial to economic growth through a reduction in poverty as a result of contributions to education, healthcare and entrepreneurship (Ratha, 2007). Feeny et.al (n.d) help to contextualize the debate through their study of remittances in SIDSs. Their summary findings reveal that the impact of remittances on economic growth in SIDSs is opposite to their developing country counterparts. They found that for their sample of developing countries per capita growth would not be lower if

remittances were excluded, but for SIDSs there was a statistically significant and positive correlation between remittances and growth. (Ahortor and Adenutsi, 2008). Furthermore, a 10% increase in remittances was found to have a 2% point increase in GDP, a discovery that held true for the Pacific (Jayaraman and Choong, 2011) and African SIDSs but not for SIDSs in the Latin American and Caribbean region. This observation shows that even across SIDs broad generalisations cannot be made on the relationship between remittances and economic growth. The differences across the SIDS were attributed to the fact that the Pacific islands possess a greater susceptibility to external shocks and have higher ratios of remittances to GDP than other SIDSs.

For CARICOM member states the channels that drive economic growth will be key in determining the overall impact of remittances on GDP and GDP per capita growth. Orozco & Hamilton (as cited in Roberts, 2007) found that among Caribbean countries, Jamaica, Guyana and Haiti experienced the strongest positive impact from remittances. Roberts also argues that remittances have had a positive impact on development in Guyana through their links to poverty reduction and financial deepening. As part of the Economic Recovery Program in 1989 the country embarked on an agenda of financial liberalization, unification of the exchange rate and the transition to a managed floating exchange rate ,all of which led to a "redirection of informal flows towards formal flows and an acceleration in the volume of recorded remittances"(Roberts,p.8). In addition, the author advocates that there is a need for policies to promote remittance transfers through financial institutions, arguing that the current system does not allow remitted funds to be made available for intermediation. Griffith (2008) also suggests that the impact of remittances could be enhanced by improving institutional quality and regulatory requirements in addition to an expansion of the financial services and products being offered to the poor. Catrinescu (2006) used observations for 162 countries over 34 years to build on the model used by Chami et al (2003).The authors measured the quality of institutions to test the validity of whether countries with better institutions do in fact receive a higher return from remittances, this was done by including in their model the corruption indicators issued by Transparency International and the United Nations Human Development Indicators (HDI). Out of 9 specifications, 5 showed that remittances appear to have a positive and statistically significant impact on growth. The authors reject the notion that remittances have a negative impact on economic growth and suggests that the quality of a country's institutions have implications for how remittances are used, specifically productive investment.

Channels for growth

Katsuhi et.al (2012) sets out three channels through which remittance flows may affect growth: through the accumulation of capital, through the effect on labour force growth and through their impact on total factor productivity growth. These three channels serve as a useful framework when looking at how remittances are able to influence economic growth and provide the context for which this writer will examine the relationship between remittances, economic growth and financial development.

Accumulation of Capital

Chiodi et al (2010) found that for rural Mexican households emigration of family members serves as a vehicle for the accumulation of productive assets in Mexico. They also suggest that remittances can help to alleviate credit constraints for poor households. Amuedo-Dorantes et.al (2014) further disaggregate these findings for Mexican remittance receiving households. The authors argue that the frequency and reliability of remittance income determines whether remittances are used for asset accumulation. In their study, the life-cycle permanent income hypothesis is tested; this hypothesis states that individuals are more likely to save an unexpected increase in income over an expected increase in income. Amuedo-Dorantes et.al (2014) proved that unanticipated remittances income raised household expenditure on human, physical and financial assets by between 4 and 9 percent (p.16) .In Barbados, Griffith(2008) found that remittances had a positive short-run and long-run effect on investment with the improvement of the Barbadian housing stock being attributed to the continual contributions of Barbadian migrants overseas.

Whether remittances are being used for investment in productive assets or for consumption smoothing they alleviate budget constraints at the individual level and even at the macroeconomic level. Ratha (2007,p.10) argues that remittances improve a country's creditworthiness when accounted for in the denominator of the indebtedness ratio, a ratio of outstanding debt to exports of goods and services. Finding that the inclusion of remittances flows in the credit assessments of Lebanon and Haiti would improve their credit ratings by two notches.

Labour Force Supply

The loss of skilled workers has been one of the major considerations for Caribbean countries in the discussion on migration and remittances. Remittances impact the labour supply directly as a result of outward migration and indirectly by influencing incentives to work at the household level. In Jamaica it was shown that remittance inflows were linked to a reduction

in the Jamaican labour supply to the extent that "increased remittance flows may negatively affect the competitiveness of the Jamaican economy" (Kim, 2007, p.16) (Bussolo and Medvedev, 2007). Amuedo-Dorantes and Pozo (n.d) expand their analysis of the impact of remittance income variability for the Mexican market and conclude that similar to earlier findings on asset accumulation, irregular remittance inflows induce more work while regular and predictable remittance income is more likely to lead to restrictions in the labour supply. Therefore, the frequency at which migrants send money to their countries of origin plays a role in how remittances are spent and ultimately whether remittances may effect economic growth through the labour supply.

Alternatively, remittances can affect the labour supply in a more literal sense. Stubbs and Reyes (2004) describes brain drain as the irreversible transfer of human capital and skills between countries. Indirectly, to embrace remittances as a source of national and individual income is also to embrace the brain drain that often accompanies outward migration. A phenomenon that is well documented and costly for small open economics; migration has the potential to reduce unemployment rates in sending countries, but at the expense of labour force growth and productivity in the receiving countries (Chami and Fullenkamp, 2013) (Hosein et al, n.d). Hosein et al (n.d) remarks that the wealth of the Caribbean region is in its untapped diaspora; given the persistency and severity of emigration from the region it is not hard to concede that the region has lost the wealth of its people to what are often perceived as brighter pastures.

United Nations records have shown that in the midst of a global rise in emigration , rates from Latin America and the Caribbean are among some of the highest; more than twice the rate of emigration from Africa and approximately seven times the rates for Asia. Among the top ten countries with the highest emigration rates to OECD countries five are CARICOM member states (United Nations-DESA, 2013,p.4), see Table 1 In addition to the volumes of individuals leaving the region, the past and present emigration of CARICOM nationals poses a threat to the development of the region due to the quality of migrants lost. Unlike global migration trends which suggests that migrants possess limited levels of education (United Nations-DESA, 2013) the Caribbean diaspora is in fact highly educated, with Hosein et al (n.d) suggesting that the majority of Caribbean emigrants possess a tertiary level education. Furthermore, emigrants are more likely to be comprised of younger individuals who are less risk-averse and more willing to take initiative (Alonso and Adenutsi , 2011), something that will have serious implications for CARICOM countries which are trying to transition to growth strategies that are motivated my entrepreneurship and innovation.

Brain drain appears to be a negative prerequisite for remittances to flow back into CARICOM member states. To embrace the development and investment potential of remittances to the region is also an acceptance of the indirect effect such as brain drain. However, the fact that the Caribbean diaspora consist of highly educated migrants is an encouraging reality for those who will seek to take advantage of the diaspora's skills and resources for the purposes of developing the region.

Table 1.Countries with the highest emigration rates to the OECD

Country	Rate	Population
1.Tonga	41%	104,326
2.Guyana*	39%	788,504
3.Jamaica*	32%	2,695,331
4.Albania	29%	2,843,005
5.Barbados*	29%	231,100
6.Trinidad and Tobago*	23%	1,330,589
7.Belize*	21%	312,603
8.Fiji	20%	864,240
9.El Salvador	19%	6,237,219
10.Malta	18%	415,388

Total Factor Productivity

The impact of remittances on total factor productivity can be broken down into two components: the relationship between remittances and the exchange rate and the relationship between remittances and financial sector development. According to Chami et al (2013) remittances can improve financial intermediation by increasing the amount of funds circulating in the financial system, and in the presence of underdeveloped financial systems or limited capital markets, remittances have a positive impact on growth by removing borrowing constraints.

The debate on whether remittances flows impact economic growth through GDP and GDP per capita has three logical conclusions: remittances have a negative effect on economic growth, remittances have a positive effect on economic growth or remittances do not have a significant effect with economic growth. However, the discussion on the relationship between remittances and the real exchange rate is based on the perception that large sustained inflows of remittances are likely to result in an appreciation of the real exchange rate. A phenomenon referred to as Dutch Disease. The appreciation of the real exchange rate is one possible channel through which remittances may have a negative impact on economic growth (Ahortor and Adenutsi, 2008) and Ratha, (2007) argues that through this channel the impact of remittances on small open economies is likely to be large, although the empirical evidence is still lacking. In the case of El Salvador remittances led to increases in household income and subsequently the consumption of non-tradable goods. As household demand shifted from tradable goods to non-tradable goods there was a decrease in the labour supply and an increase in the production costs of non-tradables, giving rise to an appreciation in the real exchange rate (Acosta et al, 2007). Bussolo and Medvedev (2007) also found evidence of Dutch Disease in Jamaica where remittances inflows resulted in labour supply contractions that ultimately led to an appreciation in the Jamaican dollar and a reduction in competitiveness. In Pakistan and The Cape Verde Islands the presence of Dutch Disease resulted in loss of country competitiveness (Makhlouf, 2011), (Falck, n.d) .For the Cape Verde Islands Falck (n.d) attributes a 14% reduction in competitiveness over ten years to presence remittances flows.

Within CARICOM member states there is no common approach to managing individual exchange rates, this may result in some difficulty when trying to suggest any linkages between the region's remittances flows and any losses in competitiveness due to the Dutch Disease. Additionally this analysis is further frustrated by the fact that some territories may already be at risk of Dutch Disease arising from natural resource windfalls.[3]

Financial Sector Development

Financial development is used an indicator of TFP. With remittances being viewed through the same lenses as other capital flows and as a potential source of development finance it is valuable to revisit the growth and development potential of financial sector development and some of the limitations that may be facing CARICOM. According to Rao(2003) financial development aids in economic growth by reducing the costs of the provisions of capital and

[3] Trinidad experienced Dutch Disease following increases in the oil price during the 1970s. (Hilaire, 2001)

through the promotion of entrepreneurship. For the majority of CARICOM territories, limited by small domestic markets there is limited choice in financial products and services, and banking practices tend to be conservative. With a financial sector that is dominated by commercial banks, the ability of remittances to have a material effect on economic growth will depend on the channels used by Caribbean emigrants to send money home. The question is: do these channels encourage or discourage the use of remittances for long-term investments or investments in productive assets?

If the traditional practices in the banking sector have been viewed as barriers to the advancement of entrepreneurship in the region then as Giuliano and Ruiz-Arranaz (2005) suggests the lack of diversity within the financial sector of the region could represent an obstacle in unlocking the economic growth potential of remittances flows to the region.. Given the trends in GDP per capita growth and remittances flows in **Figure *1*** the observations of Easterly and Levine (2001) and Rao (2003) are certainly applicable, growth is seldom persistent over time while capital accumulation is. Capital accumulation does not adequately explain growth cycles, leading economists to examine more closely the concept of total factor productivity (TFP) . The debate surrounding the effectiveness of remittances for development is not one of questioning the volumes or even reliability of these flows, it is one of how these funds are deployed; there is therefore value in examining remittances in tandem with financial systems and institutions.

Earlier arguments for a positive correlation between remittances flows and economic growth and development were based on the expectation that remittances improve social development indicators such as healthcare and education, as well as facilitating entrepreneurship. One of the challenges facing Caribbean entrepreneurs is access to credit, remittances could play an important role in encouraging economic growth by eliminating some of the barriers to financing faced by start-up businesses. Gupta et al(2007) notes that the money transfer services used by migrants present an important stepping stone for households to access formal financial services and for their sample of Sub-Saharan countries they suggests that remittances could be channelled by microfinance institutions in order to supply start-up capital to small businesses. Woodruff (2007) found that Mexican entrepreneurs who were able to take advantage of existing migrant networks reported higher investment levels, higher capital-output ratios and higher profits

Remittances

The macroeconomic impacts of remittances in the literature appear inconclusive partly because the use of remittances on a micro level are country specific, dependent on the decision making tendencies of local households in addition to the economic and financial sector environment. As part of Caribbean Single Market and Economy (CSME) much attention has been given to intraregional labour movements and the harmonization and coordination of regional financial systems, with a monetary union being one possible outcome of the region's efforts. Therefore, understanding the relationship between remittances, growth and financial sector development in CARICOM is relevant for the Caribbean integration movement and even for financial services providers.

Not surprisingly, the global linkages between financial development and remittances have been ambiguous. Giuliano & Ruiz-Arranz (2005) using a sample of 29 developing countries confirmed the existence of a positive relationship between remittances and GDP and then proceeded to test whether the recipient country's financial depth could influence the impact of remittances on growth. Using variables related to the banking sector as a proxy for financial development they found that there was a negative correlation between remittances and financial depth; introducing the possibility that the marginal impact of remittances on growth is decreasing with the level of financial development. In a grouping of countries from the Middle East and North Africa, Yaseen (2012) using the Giouliano & Ruiz-Arranz model(2005) also found that there was a negative and significant interaction term between the financial development index and remittances suggesting the "substitutability of remittances for financial systems" (Giouliano & Ruiz-Arranz model ,2005,p.5). The substitutability of remittances for financial systems is related to whether households are integrated into the formal financial system and whether the financial system is able to provide services that adequately meet individuals' needs. In the absence of a developed and functioning financial system individuals may use remittances as a substitute for having savings accounts, access to credit and insurance coverage.

Orozco (2006) also suggests that the developmental impact of remittances can be increased when linked to financing. As a result the author identifies four challenges in the attempts to leverage remittances for development: the limited financial intermediation available to remittance recipients, lack of remittance literacy among senders, the regulatory environment in the host country and failure of technological solutions to transform remittance senders into bank account holders.

Financial Sector Development in CARICOM

There is currently no indication of the volume of remittances circulating within the banking sector in CARICOM. However there are many commentaries on the state of financial sector development in the Caribbean. The region's financial landscape has been largely dominated by commercial banks who have existed to meet the needs of a conservative business class (Cepal, 2007).The narrow focus on commercial banks (Ogawa, 2013)has meant that the region's capital markets have remained largely underdeveloped, greatly threatening the growth potential for small and medium sized enterprises (SMEs) across the region. Former Governor of the Central Bank of Barbados suggests that within the Caribbean community access to finance from non-traditional sources, rather than cost, is the main constraint for small business (Williams, 2004). It was earlier shown that in Barbados' remittances contributed to improvements in the housing stock, indicating that individuals who received remittances were using them for long term investments. Further suggesting that individuals may choose to rely more heavily on remittances to finance home development rather than attempting to source credit from a formal institution.

If the impact of remittances on GDP growth in CARICOM does come through a correlation with financial sector development then Ramlal and Watson (n.d) sheds some light on how this could happen. The author's measured financial development using the ratios of M2 to GDP and the ratio of domestic credit to the private sector and GDP and used these variable to investigate the correlation between financial development and GDP growth among Trinidad and Tobago, Barbados and Jamaica. They found that over the long run financial intermediation through the money variable will lead to economic growth while intermediation using private sector credit will have a dampening effect, a result that is not surprising when there is a strong potential for private credit to fund consumption of imported goods. For these three countries the extent to which financial development impacts on growth will be determined by which financial variable is strongest. Fitzgerald (2006) challenges this analysis by arguing that the ratio of M2 to GDP is misleading and although credit to the private sector is a better measure of financial intermediation, stock market liquidity and legal rules are superior measures of efficiency and financial intermediation. However he does concede that the supremacy of the latter variables is more likely to be evident in developed economies where there are a myriad of non-banking financial institutions (NBFIs).

The Caribbean territories exhibit some characteristics that would indicate financial development, Ogawa et al (2013,p. 4)describes the financial sector in the Caribbean as being

large relative to the size of its economies. Furthermore, total assets of the financial sector, excluding offshore banks amount to 124% of regional GDP with the banking system accounting for some 91%.The remainder can be attributed to the region's NBFIs, mainly credit unions and insurance companies.

It could be argued that the CARICOM financial system is the result of economic structures biased heavily towards agriculture and established corporate entities, Deloitte Touche Tohmatsu Emerging Markets Ltd (2004) suggests that the development of small and medium sized enterprises (SMSEs) have suffered as a result of the current financial market design. In summary, for the majority of Caribbean countries the drivers of economic growth have not required or encouraged complex or innovative financial system. The IMF(2013,p.1) states that the region has experienced stagnant growth within the preceding two decades, recognizing the shortcomings of pre-existing economic strategies there has been a definite shift in focus towards entrepreneurship from the private and public sector, Malaki (2013) goes as far as to imply that entrepreneurship must be given a greater part to play in achieving regional convergence but not without greater regional harmonization of regional institutional frameworks for a better facilitation of business.

From the literature there is no doubt that policymakers are justified in turning their attention to the potential that remittances exhibit as a developmental tool. Furthermore the literature shows that broad generalisations should not be made on the capabilities of remittances to foster economic growth. The discourse on the impact of remittances need to account for country macroeconomic and institutional factors as well as the remitting behaviour of countries' international stock.

This necessity has led many researchers to undertake empirical analyses, developing in depth country specific studies similar to what has been done in Mexico and the research carried out by Amuedo-Dorantes and Pozo(2007,n.d) and studies investigating the behaviour of remittances across countries and time, referred to in the literature as panel data. The literature supports the need for empirical analysis on the relationship between remittances and economic growth and lends support to the use of the dynamic panel estimation methodology which will be described in the following section.

3 RESEARCH METHODOLOGY

3.1 Research Approach and Strategy

The discussion on the relationship between remittances and economic growth and remittances and development is one that continues to evolve with each new country and regional study. As has been seen in the literature there are many channels through which remittances may impact upon a country's macroeconomic environment and influence households' decisions making processes, this paper is exploratory in nature in that it seeks to locate the current discussion on remittances in CARICOM within the existing literature in combination with an empirical analysis of available data to stimulate questions for further investigation.

The literature presents a number of valid outcomes regarding the impact of remittances on economic growth as measured by GDP. In this paper the author attempts to determine which of these outcomes is most valid for CARICOM given the nature of CARICOM's growth history and future expectations.

Certainly, even before conducting an analysis into the relationship between remittances and growth the data point strongly towards the impact of remittances on growth through their effect on labour supply and productivity. However, empirical studies such as those carried out by Amuedo-Dorantes and Pozo have yet to be carried out for CARICOM as a region. Arriving at an overall conclusion on the impact of remittances on economic growth in the region gives some direction as to which channels deserve a closer inspection and could potentially welcome a policy intervention.

Given the relevance of financial systems to economic growth (Levine, 1997) and the emphasis on financial liberalization between CARICOM member states, the author felt it relevant to follow in the path of Giuliano(2005) to investigate whether the current state of financial development within CARICOM played a role in how and whether remittances impacted upon GDP growth.

Policy makers have exhibited an optimism on the ability of remittances to stimulate economic development, but given the dominance of commercial banks in the region's financial sector and the limited diversity in non-bank financial institutions this author questions whether the region can maximise remittances potential given the current structure of the region's financial systems. The structure of financial systems in CARICOM is also a factor in the bloc's financial development. A financial system that has been developed around the dominance of

institutions such as commercial banks, with limited involvement of other NBFIs, can be constrained in its ability to provide financial services that are accessible and affordable for potential consumers.

This led to the development of two hypotheses: 1) Remittances have a positive impact on GDP growth in CARICOM and 2) The impact of remittances on GDP growth in CARICOM is correlated with financial development within the region.

In order to tests these two hypothesis regression analyses were carried out using two regressions: one explaining GDP per capita growth using a set of control variables plus the variable of remittances as a share of GDP, and the second one explaining GDP per capita growth using the original set of control variables, remittances as a share of GDP and proxy variables for financial sector development (Giuliano, 2005).

3.2 Data Collection, Frequency and Choice of Data

Although the model used in Giuliano and Ruiz-Arranz (2005) and Yaseen (2012) serves as the inspiration for the quantitative analysis in this paper this author felt the need to adapt it to make it relevant for the CARICOM context. The most notable departure from the model used by Giuliano (2005) is the inclusion of Government Expenditure as a share of GDP.

The variables collected for the study were in accordance with the United Nations ECLAC analysis of 2009 and are provided in Table 2: List of Variables. Data was sourced from the World Bank's World Development Indicators (WDI) and variable descriptions are as per the WDI definitions.

Table 2: List of Variables

Variables	Description
REMIT:Personal Remittances received as a share of GDP (in Logarithms)	Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from non-resident households.
GDP_I: Initial GDP	One Lag of GDP
GDP: GDP per Capita (annual growth %)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products
Physical Capital Variables	

Gross Fixed Capital Formation	Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings
Financial Variables	
CREDIT: Credit to the Private Sector by banks as a share of GDP	Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment
M2 : Money and quasi money as a share of GDP(in logarithms)	Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government.
Macroeconomic Stability Variables	
INF: Inflation(in logarithms of 1+inflation)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly
Structural Variables	
TRADE:Trade as a share of GDP	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product
Fiscal Variable	
GOV.EXP: Government Expenditure as a share of GDP	Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories
Demographic Variable	
POP: Population Growth	Annual population growth rate for year t is the exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of

	asylum, who are generally considered part of the population of the country of origin

In the literature, empirical analysis utilising panel data is a widely chosen qualitative approach. The use of panel data allows researchers to explore dynamic relationships and control for unobservable and unmeasurable explanatory variables that change across entities but not with time (Wooldridge, 2002). Such variables may include country specific factors such as culture and political systems. The exact treatment of these effects will be discussed in the following section.

This paper utilizes a panel dataset consisting of observations from 13 CARICOM member states for the time periods between 1975 and 2013.This length of time was chosen in an attempt to include as many observations as possible for analysis giving the already limited information provided for some of the countries within the study. There are 14 member states in CARICOM but Bahamas was dropped from the analysis due to there being no available data on remittances in the World Bank's WDI. Government fiscal balance was one of the variable used by Giuliano and Ruiz-Arranz (2005) but was not included here due to a large set of missing observations for the countries and years being used in the sample.

3.3 Data Analysis Methods

When using panel data researchers are forced to choose which estimation methodology they will use to address the unobserved or unmeasurable country and time specific effects. This usually begins with a choice between a fixed effects (FE) or a random effects model (RE). In a fixed effects model researchers are only interested in investigating the impact of country variables that vary across time. By using a fixed effects model they have also assumed that there may be other factors which could impact upon the relationship they are trying to investigate and a failure to appropriately deal with these effects could lead to statistical outcomes that are biased and misleading.

Alternatively researchers may choose to adopt a random effects model where differences across countries are assumed to be random and uncorrelated with the dependent variable. As a result the unobserved effects do not lead to biased outcomes in statistical analysis.

In their study Giuliano and Ruiz-Arranz(2005) included a fixed effects model using the following equation.

$$GDP_{it}=\beta_0+\beta_1 GDP_{I,t-1}+\beta_2 REM_{it}+\beta_3 X_{it}+\mu_t+n_i+\varepsilon_{it}$$

Where $GDP_{I,t-1}$ represents previous levels of economic growth, REM_{it} is the ratio of remittances to GDP, X_{it} is the matrix of control variables, μ_t and $n_{i\ are}$ the time specific and country specific effects respectively and $\varepsilon_{it,}$ the error term.Based on the dataset being selected for this study the use of a FE model is not unexpected.

CARICOM despite shared historical experiences and a strong past dependence on agricultural activity exhibits significant differences in growth rates and in its drivers of economic growth. Ramkissoon (2002) attributes growth rates among member states to the following categories: geography, natural resources, openness, economic structure, workers remittances, vulnerability, political stability, culture and social cohesion, independence, endogenous policy and initial conditions.

Apart from the a priori expectation that a fixed effects model would be best suited for carrying out this paper's empirical analysis the preference for the this model over a RE was also confirmed by the use of the Hausman Test. The Hausman Test operates with the assumption of a null hypothesis that the RE model is preferred and an alternative hypothesis which states that a FE is preferred. The result of this test are provided in the Appendix.

According to Roodman(2009) and Mileva (2009) the GMM estimator should be used when there is lag of the dependent variable included among the explanatory variables, there are independent variables that are not strictly exogenous, fixed individual effect and heteroscedasticity and autocorrelation within panels.

Giuliano and Ruiz-Arranz (2005) estimated their equation using a FE, Ordinary Lease Squares (OLS) and the General Method of Moments as developed by Arellano-Bond in 1991.While variations of the FE model can be generated by the software package to account for heteroskedasticity, autocorrelation and cross panel correlation separately or even two of the three possibilities it cannot be estimated to correct for all three occurring simultaneously. The estimation procedure is further complicated by the prospect of a two way relationship between remittances inflows and economic growth, the difficulties in adequately addressing this endogeneity are what Barajas et al (2009) challenged in the spate of empirical literature showing a positive relationship between economic growth and remittances inflows. In all three of the estimation techniques executed by Giuliano and Ruiz-Arranz (2005) used two lags of the variables that were not strictly exogenous as instruments: these included remittances as share

of GDP and their financial depth indicator. United Nations ECLAC(2009) included investment among their instrumented variables for their GMM regression for GDP growth in the Caribbean. The GMM regression in this paper utilized two lags of remittances as a share of GDP and gross fixed capital formation as a share of GDP for the instrumented variables. Inflation and annual population growth were treated as the exogenous variables along with the lagged dependent variable.

Although inflation has been found to be statistically insignificant in some studies, Yaseen (2012),Giuliano (2005) and United Nations ECLAC(2009) all reported inflation to be statistically significant with the expected negative effect on economic growth. The initial regressions using the GMM estimates showed inflation to be statistically insignificant, this raised some concern and other attempts at estimating variations of the initial model revealed that there could be some interaction between the remittances and inflation variables. To investigate this possibility an interaction between inflation and remittances was added to the first regression.

For the second set of regressions the proxy variables for financial development were added to the original regression. Additionally, remittances were interacted with the two financial development proxies and these two new terms were added to the second regression to investigate whether our two indicators of financial depth impacted upon the relationship between remittances and GDP per capita growth.

Financial sector development endogeneity

Similar to the remittances inflows financial sector development is also touted as having a two-way causal relationship with economic development. Patrick(1966) found that financial development facilitated economic growth in the early stages of development but the direction of causation was reversed for more advanced stages of development. Other studies lend support to the idea that financial development leads to economic growth and the role of financial development in leading to economic development is dependent on the quality of the financial institutions established (Levine,2000).In this study the financial development proxies will be treated as variable that are not strictly exogenous as was done by Giuliano and Ruiz-Arranz (2005).

3.4 Research Reliability and Validity

The estimation methodology used in this paper is one that has been widely utilized in the literature for analysis of the relationship between remittances and economic growth being investigated in this paper, see Giuliano and Ruiz-Arranz(2005), Yaseen (2012) and United Nations ECLAC, (2009). This methodology was chosen for its ability to reduce the errors and biases arising from the presence of heteroscedasticity, autocorrelation and cross-correlation across the data panels.

The method used minimises errors arising from the methodology used to estimate the regression equation but does not address the presence of unit roots among the variables used. The results of the unit root tests are presented in the Appendix. Unit root tests have been criticised for their lack of power (Libiano, 2005) (Levin et al, 2002) in determining whether or not a data series is legitimately non-stationary ie. possesses a unit root.Libanio (2005) suggests that unit root tests in single country samples may have a tendency to misrepresent the presence of unit roots within a series.In panel data the tests is deemed to be more powerful but is still limited due to presence of cross-secitional correlation among error terms and their sensitivity to time-series variables(Libiano,2005,pp.157).The methodology utilised in this paper has not corrected for the presence of unit roots within the data.

The validity and reliability of the research methodology is upheld by the results of a number of statistical test and visual inspections of the data reported in the Appendices. Furthermore, the direction of influence of the regression equation's control variables are compared to the findings of other researchers who have modelled these relationships for other developing countries. Furthermore, United Nations ECLAC, (2009) utilised the same estimation methodology and the results of this paper's empirical analysis have been compared to the results of the mentioned authors.

3.5 Limitations

Missing data represented a significant limitation for the empirical analysis carried out within this study and the availability of adequate observations for some variables meant that although they were theoretically relevant they were not used in the estimation process. The unavailability of data also provides a likely explanation for the dearth of empirical studies explaining remittances behaviour and even growth at the regional level.

This author maintains that having limited empirical references for CARICOM presents itself as a limitation. For empirical analysis the methodologies used by other authors provide direction for addressing any peculiarities in the data that are due to the sample of countries being studied. The investigation of the relationship between remittances and economic growth by determining the effect of remittances on GDP and GDP growth is not a novel area of research. However, researchers may use it as a starting point to generate insights on other factors that might be influencing the relationship between remittances and economic growth. Therefore, it is possible for there to be more than one study investigating the relationship between remittances and growth for the same region, but each making a unique contribution to the field by carrying out further investigations into other influential variables. This paper is unable to cross reference its findings with other empirical research on remittances and economic growth in CARICOM and must establish a correlation between the two variables before proceeding to investigate what other factors could be playing a role.

The proxies for financial development used are commonly embraced in studies seeking to examine the role financial development in economic growth. The two proxy variables used for financial development in this study only capture one aspect of financial development: financial depth. Other characteristics of financial development include financial access: measured by accounts per household, efficiency: measured by net interest margin and stability: measured by the Z-score i.e. distance to default (Demirguc-Kunt, n.d).

The functions of a country's financial sector are to facilitate the trading of risk, the allocation of capital, corporate governance, facilitating trade and the provision of financial contracts (Demirguc-Kunt, n.d) (Giuliano, 2005).The freedom of movement for capital under CSME means that if one of these functions is constrained in one territory it is possible for capital to move to another domain where there is greater financial development. The measures of financial development used in this paper are limited in that they only account for financial depth within individual countries. Given the current and projected financial integration within CARICOM the analysis would be strengthened by an indicator of the depth of financial activity taking place between member states. Furthermore, intraregional migration results in the transferral of money between territories, accounting for the level of financial development or integration among Caribbean countries and isolating intraregional remittances inflows could yield and entirely different result.

4 RESEARCH FINDINGS, ANALYSIS AND DISCUSSION

The pairwise correlations of the selected variables are shown in **Error! Reference source not found.**. From these estimations the previous year's GDP per capita growth, trade openness and fixed capital investment have the strongest significant correlations with GDP per capita growth. Financial development as measured by credit to the private sector by banks and M2 have a negative correlation with GDP per capita growth but the relationship is not statistically significant. Personal remittances as a share of GDP have a positive correlation with GDP per capita growth but the relationship is not statistically significant. However, the highest correlation with remittances is exhibited by inflation and M2.

Table 3: Correlation between variables

	GDP	GDP_I	LogTRADE	POP	GOV.EXP	INV	LogREMIT	LogINF	CREDIT	LogM2
GDP	1									
GDP_I	0.3083*	1								
LogTRADE	0.2893*	0.3057*	1							
POP	-0.1744*	-0.1744*	-0.2279*	1						
GOV.EXP	-0.1593*	-0.1355*	0.2093*	-0.1310*	1					
INV	0.2114*	0.2278*	0.4044*	-0.0816	-0.0926	1				
LogREMIT	0.0807	0.1004*	0.1372*	-0.0934	-0.2497*	0.2694*	1			
LogINF	-0.1815*	-0.09	-0.2868*	0.1401*	0.1044*	-0.1936*	-0.2867*	1		
CREDIT	-0.0251	0.0209	0.2479*	-0.0158	-0.072	0.2773*	0.2069*	-0.5259*	1	
LogM2	-0.0774	-0.0557	0.2488*	-0.1861*	0.1314*	0.3029*	0.3037*	-0.4268*	0.7316*	1

* indicates pairwise correlations significant at α=0.05

The regression results of GMM dynamic panel estimation are shown in **Table *4***.

With the exception of INF all of the other control variables have the expected signs and are statistically significant in their contributions to GDP per capita growth. As in the study done by Giuliano and Ruiz-Arranz(2005), GDP per capita growth in the previous time period is significant at all levels and has a negative impact on GDP per capita growth in the next period. In accordance with economic theory trade openness and investment in fixed capital both have a positive impact on economic growth. As expected population growth is not significant to the model, however while this in line with what was recorded by Giuliano and Ruiz-Arranz (2005) and United Nations ECLAC (2009) the sign reported suggest the negative influence of population growth on GDP per capita growth. Government expenditure was shown to have a negative influence on GDP per capita growth.

Inflation is expected to have a negative impact on economic growth and both Giuliano and Ruiz-Arranz(2005) and United Nations ECLAC (2009) reported a negative and significant effect of inflation on their economic growth variable in their estimations. However the first set of GMM estimation results generated did not produce a statistically significant inflation variable. An interaction term was then created between remittances and inflation, these results are shown in column 2 of **Table *4*** and produce the expected results for the effect of inflation on economic growth. Note however that while investment has positive and significant on economic growth in the first regression, in the presence of the interaction term between remittances and inflation the effect of investment on economic growth is no longer statistically significant. Remittances as a share of GDP do not have a significant effect on GDP per capita growth in either of the growth regressions but while it is insignificant and positive in the first regression in the presence of significant inflation the variable takes on a negative sign.

Giuliano and Ruiz-Arranz (2005) also reported a positive but insignificant effect for their remittances variable in their initial regression, however they were able to demonstrate that the significance of the effect of remittances marginally increases when investment is dropped from the estimated model. As a channel through which remittances may impact upon economic growth the presence of investment in the initial regression actually helps to mask the true effect that overall remittances may be having on GDP growth per capita. While the results of Giuliano and Ruiz-Arranz(2005) suggests that the effects of remittances on economic growth can be camouflaged by certain other growth determinants the results shown in **Table *4*** suggests that in the CARICOM experience remittances have the potential to mask other macroeconomic variables.

Although the interplay between remittances and inflation was not investigated further, the results suggest symptoms of the Dutch Disease and furthermore support the arguments that

broadly speaking remittances are being used to fuel consumption. Unfortunately for the smallest CARICOM member states even consumption channelled into investments in physical assets could be detrimental due to the heavy import nature of their economies. Similarly (Lopez, 2007)claims that in the presence of the Dutch Disease remittances fuel inflation by raising overall prices in the economy. While this is explained as a trade-off between tradable and non-tradable goods that can eventually lead to an appreciation of the real exchange rate. Even without reference to the Dutch Disease framework remittances are suspected of producing inflationary pressures due to the high propensity of households to use them for increased short term consumption Balderas and Nath (2008).

The interaction term between remittances as a share of GDP and inflation suggests that rather than the inflationary pressure produced by increased consumption the role of remittances has been to counteract the negative impact of inflation leading to a positive impact on GDP per capita growth. This is a significant result for small open countries that import inflation through their vast array of national imports and confirms the role of remittances in facilitating consumption smoothing at the household level and the positive influence that remittances can have on poverty alleviation and development.

Giuliano and Ruiz-Arranz(2005) state that the results of their paper contradict other studies which argue that remittances are beneficial for overall country development. However the authors acknowledge that this disparity between their findings and the literature might be due to the heterogeneous effect of remittances across countries based on factors accounted for in their starting regression which did not account for the role of financial development. Consequently, they introduce their proxy variables for financial development to develop a framework for understanding why remittances have a disputed effect on economic growth.

Table 4 GMM estimation with inflation

	GMM Estimation	
	1	2
	Dependent Variable GDP per capita growth	
GDP_I	-0.302* (-0.107)	-0.353*** (-0.0777)
LogTRADE	12.65*	15.32*

	(-5.156)	(-6.728)
POP	-2.612 (-1.377)	-2.785 (-1.619)
GOV.EXP	-0.630** (-0.197)	-0.589* (-0.213)
INV	0.199* (-0.0815)	0.148 (-0.106)
LogREMI	0.401 (-0.574)	-0.665 (-0.938)
LogINF	-0.59 (-0.438)	-2.486** (-0.681)
INT.INF*REM		0.611* (-0.276)
Observations	288	273
P-Value Hansen Test	1	1
AR(1)	0.0253	0.0564
AR(2)	0.0624	0.162
J	75	75

* significant at 5 percent, ** significant at 1 percent, *** significant at 0.10 percent
Standard errors in parentheses

In my analysis the introduction of the two financial development proxy variables and the corresponding interaction terms with remittances did not change the statistical significance of the effect of remittances on GDP per capita growth. Results are shown in **Table *5***.

Table 5: GMM Estimation with financial variables

	GMM Estimation
	Dependent Variable GDP per capita growth
GDP_l	-0.194 (0.103)

LogTRADE	11.588* (3.923)
POP	-1.507 (1.4850
GOV.EXP	-0.4226*** (04226)
M2	5.430 (5.558)
CREDIT	-0.329 (0.111)
LogREMIT	5.172 (7.006)
LogINF	-2.67*** (5.785)
INT.INF*REM	0.883*** (0.1611)
INT.M2*REMIT	-2.541 (1.936)
INT.CREDIT.REMIT	0.127* (1.936)
Observations	288
P-Value Hansen Test	1
AR(1)	0.011
AR(2)	0.770

* significant at 5 percent, ** significant at 1 percent, *** significant at 0.10 percent
Standard errors in parentheses

The two financial variables are used as endogenous variables during the estimation process. In the absence of remittances and investment as determined by fixed capital formation, both proxy variables for financial development are shown to be statistically significant. M2

exhibited a positive influence on economic growth and credit provided by commercial banks to the private sector exhibiting a negative influence on GDP growth. This negative correlation is likely to arise when credit is being used to fuel the consumption of imported goods, in the absence of these variables trade openness was shown to have a positive effect on GDP per capita growth.

Of the two interaction terms that were created to test the influence of financial development on the remittances-economic growth relationship only the interaction between remittances and credit to the private sector by banks was significant. This suggests that remittances are a complement to bank credit in that they are being used to fund consumption in productive assets or long-term investments. This is in line with the findings of Amuedo-Dorantes and Pozo (2014) in Mexico where remittance receiving household used their savings to complement monies being received to invest in productive assets.

The interactions between the remittances, inflation and banking sector credit help to build the case for remittances not necessarily as a source of development finance but for entrepreneurial finance. The findings further suggests that there might be altruistic and financial motivations driving CARICOM migrants outside of the region to remit but also that these funds are being used for more than short-term consumption on imported goods. If migrants abroad and receiving households have already established the role of remittances as a source of investment capital there should be scope for targeting this existing relationship to direct the investment of remittances into small business development or larger national infrastructural projects.

5 RESEARCH CONCLUSIONS

This paper sets out to investigate whether remittances inflows were having a positive effect on GDP per capita growth in CARICOM and whether financial development played a role in the interaction between remittances and economic growth. The literature on remittances has conclusively shown that remittances are beneficial for poverty alleviation and facilitating development by providing additional income to be spent on education, healthcare, investments in property and even for the creation of SME's. These benefits have resulted in a view that remittances can and perhaps should be targeted as a source of development finance and even entrepreneurial finance. However, the caveat exists that while broad generalisations can be made on the benefits of remittances for individual households what has been less clear is the role of remittances as it related to macroeconomic conditions and more specifically the role that remittances play in effecting economic growth. The studies that exist have either been based on a broad spectrum of developing countries that are heterogeneous in a number of the institutional and non-institutional factors that determine economic growth or they have focussed on specific country groupings for analysis: SIDS (Amuedo-Dorantes and Pozo, 2007), Latin America and the Caribbean (Acosta et al, 2007),Sub Saharan Africa and the Pacific Islands (Falck and Bourdet, n.d). Analysis for the Caribbean region has been limited to the inclusion of a few Caribbean countries in the LAC remittances and migration framework, this paper isolates the Caribbean from the larger grouping and focusses on Caribbean countries that are members of the regional trading bloc CARICOM.

The unique nature of CARICOM countries are precisely what should challenge the acceptance of any particular viewpoint on the effect of remittances on economic growth, this paper confirms that broad assumption cannot be made regarding the impact of remittances on GDP per capita growth or the degree to which financial development is able to influence the use of these flows at the level of the household. We also see that the financial sector within CARICOM is dominated by banks and other traditional deposit taking institutions; due to the limitations arising from the unavailability of data the variables used to assess financial development in this study were M2 and credit provided to the private sector by banks. Unlike Giuliano and Ruiz-Arranz (2005) who was able to use a broader selection of proxy variables for financial development thereby enabling a conclusion to be made on the role of financial development in the remittances-growth relationship this paper is limited to the roles of M2 money and banking sector credit, therefore it is not able to make recommendations on the role that financial development can play in influencing the effects of remittances on growth but is a

useful start for understanding how remittances are interacting with a financial sector that is dominated by banks.

Although the empirical literature concerning the impact of remittances on economic growth in CARICOM is limited, there is individual research on the role of remittances in select countries that can be used as an indicator of some of the possible channels through which remittances may negatively or positively impact upon GDP per capita growth in the region. The variation of analyses in these individual country studies further reinforces the fact that assumptions cannot be made about whether remittances are beneficial to economic growth as a priori it is not easy to determine which of these channels is dominant at a national or regional level.

The initial empirical evidence would suggests that remittances have not been significant to economic growth in CARICOM. However, further investigation revealed that remittances do have a positive influence on GDP per capita growth through their interactions with inflation and credit provided to the private sector by banks. These findings are relevant as many CARICOM member states are large importers of foreign inflation and their financial systems are dominated by commercial banks.

6 RECOMMENDATIONS FOR FUTURE RESEARCH

This study has been an exploratory study into the relationship between personal remittances and economic growth in CARICOM as measured by GDP per capita growth. The literature on remittances is vast with great attention being paid to certain migrators and remittances corridors, for example the work done by Amuedo-Dorantes et. al (2014)in understanding the role of remittances inflows at the household and national level. Future research should attempt to make distinctions between remittances from outside of the region and remittances being transmitted from other CARICOM states, this need not be done at the regional level but could be done on a case study basis and would give a clearer understanding of the role of existing financial institutions and perhaps indicate the kind of institutions and services necessary to maximise the development-growth potential of remittances.

This paper did not investigate the role that self-interest and altruism play in motivating migrant remittances to the Caribbean. However the literature has shown that the motivation behind migrant remittances influence the relationship between the sender and receiver of the transmitted funds. Such relationships ultimately have implications for how receiving household choose to spend the money that has been sent to them. The findings of this paper show that remittances affect GDP per capita growth by mitigating against the effects of inflation and counteracting the negative effects of banking credit to the private sector. It is therefore suggested that further research be carried out to determine whether the correlation between remittances and these variable is determined by the Caribbean diaspora's motivation to remit.

While work is being done on the role of remittances in some individual CARICOM territories there needs to be a greater understanding of the overall regional dynamics, the suggestion that the role of remittances be examined within the framework of spatial Dutch Disease was made by Papyrakis and Raveh (2012) who concluded that resource windfalls in oil rich provinces in Canada resulted in a kind of Dutch Disease that also effected provinces that were not resource rich.

Acosta et.al (2007) and others have pursued the analysis of spatial Dutch Disease as it relates to remittances inflows.Given the remittances windfalls received by some CARICOM member states future research could investigate the spatial relationship of remittances with

economic growth within the region and whether remittances windfalls in one country impact on economic growth is other territories.

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APPENDICES

Hausman Test Results

	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
GDP	0.1442892	0.218153	-0.0738635	0.165702
Log TRADE	5.084152	3.337594	1.746558	1.191455
POP	0.0255354	-0.32177	0.3473043	0.6225044
GOV.EXP	-0.1851192	-0.09787	-0.087252	0.0587973
INV.	0.1121364	0.045412	0.0667247	0.0426615
LogREMIT	0.1208403	-0.30332	0.4241587	0.310471
LogINF	-0.4813233	-0.49622	0.0148944	0.2064589

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 6.66
Prob>chi2 = 0.4654
(V_b-V_B is not positive definite)

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation
F(1, 11) = 9.838
Prob > F = 0.0095

We reject the null hypothesis of no first-order autocorrelation.

Test for Cross Sectional Dependence

Pesaran's test of cross sectional independence = 3.299, Pr = 0.0010

Average absolute value of the off-diagonal elements = 0.254

The null hypothesis is H_0 no cross-sectional dependence between panels.
The test rejects the null hypothesis of no cross-sectional dependence.

Unit Root Tests

For panel datasets which are not strongly balanced the recommended tests are the Fisher Test and the Im-Pesaran-Shin Test. Below are the results of the Im-Pesaran-Shin Test.[4]

The tests were carried out on the dependent and independent variable data series. The only variable that does not demonstrate the presence of a unit root is GDP per capita, denoted by GDP.

GDP

Ho: All panels contain unit roots	Number of panels = 13
Ha: Some panels are stationary	Avg. number of periods = 35.23
AR parameter: Panel-specific	Asymptotics: T,N -> Infinity
Panel means: Included	sequentially
Time trend: Not included	Cross-sectional means removed

ADF regressions: 2.00 lags average (chosen by AIC)

	Statistic	p-value
W-t-bar	-8.0345	0

GOV.EXP

Ho: All panels contain unit roots	Number of panels = 13
Ha: Some panels are stationary	Avg. number of periods = 33.77
AR parameter: Panel-specific	Asymptotics: T,N -> Infinity
Panel means: Included	sequentially
Time trend: Not included	Cross-sectional means removed

ADF regressions: 1.15 lags average (chosen by AIC)

[4] According to http://www.stata.com/manuals13/xtxtunitroot.pdf

	Statistic	p-value
W-t-bar	-2.3686	0.0089

LogPOP

Ho: All panels contain unit roots — Number of panels = 13
Ha: Some panels are stationary — Number of periods = 39

AR parameter: Panel-specific — Asymptotics: T,N -> Infinity
Panel means: Included — sequentially
Time trend: Not included — Cross-sectional means removed

ADF regressions: 4.23 lags average (chosen by AIC)

	Statistic	p-value
W-t-bar	-2.4058	0.0081

CREDIT

Ho: All panels contain unit roots — Number of panels = 13
Ha: Some panels are stationary — Avg. number of periods = 36.31

AR parameter: Panel-specific — Asymptotics: T,N -> Infinity
Panel means: Included — sequentially
Time trend: Not included — Cross-sectional means removed

ADF regressions: 2.08 lags average (chosen by AIC)

	Statistic	p-value
W-t-bar	-0.7678	0.2213

LogREMIT

Ho: All panels contain unit roots — Number of panels = 13
Ha: Some panels are stationary — Avg. number of periods = 30.62

AR parameter: Panel-specific — Asymptotics: T,N -> Infinity
Panel means: Included — sequentially
Time trend: Not included — Cross-sectional means removed

ADF regressions: 1.23 lags average (chosen by AIC)

	Statistic	p-value
W-t-bar	-1.8504	0.0321

LogTRADE

Ho: All panels contain unit roots — Number of panels = 13
Ha: Some panels are stationary — Avg. number of periods = 33.77

AR parameter: Panel-specific — Asymptotics: T,N -> Infinity
Panel means: Included — sequentially
Time trend: Not included — Cross-sectional means removed

ADF regressions: 1.69 lags average (chosen by AIC)

	Statistic	p-value
W-t-bar	-1.1585	0.1233

LogM2

Ho: All panels contain unit roots — Number of panels = 13
Ha: Some panels are stationary — Avg. number of periods = 36.31

AR parameter: Panel-specific Asymptotics: T,N -> Infinity
Panel means: Included sequentially
Time trend: Not included Cross-sectional means removed

ADF regressions: 2.15 lags average (chosen by AIC)

	Statistic	p-value
W-t-bar	-1.7345	0.0414