Migrants' Remittances, Financial Development, and Economic Growth: The Relationship

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SHELTON, Abel Chukwu

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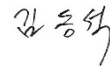
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Committee in charge:

Professor Kim, Dongseok, Supervisor _____

Professor Kim, Taejong _____

Professor Kim, Hyeon-Wook _____

Approval as of August, 2021

DECLARATION

I, Abel Chukwu Shelton, do hereby declare that with the support of both my primary and secondary supervisors, this paper is an outcome of research conducted solely by me, and to the best of my knowledge, has not been submitted, partially or completely, for any academic award. Any and all materials have been appropriately referenced and acknowledged.

DEDICATION

This work is dedicated to my dearly beloved mother.

ACKNOWLEDGEMENT

ABSTRACT

By virtue of its growing trends, volume, and dependency, migrants' remittances have proven to be an incredibly significant source of external finance in the international capital market in contemporary times. Even more so, the question of whether remittance has a substantial impact on the growth of economies as it interplays with other traditional influencers of growth such as financial development, is one of the most widely researched questions amongst scholars. This study was commissioned to observe the connexion between migrant remittances and the growth of economies as well as the combined effects on growth, of migrants' remittances and the advancement of the financial sector. The question of whether remittance works with financial development as a complement or substitute was also explored. We utilized an up-to-date panel data set of 64 countries over a 30-year period whilst employing the system GMM approach to control for potential endogeneity. The results from the study indicate that on its own, remittance has a positive but slightly inconsequential effect on growth. However, the variable proved to be positively significant in its interplay with the advancement of the financial sector as evidenced by the positive coefficient on the interaction terms. These findings lend credence to the postulation of previous studies such as Mundaca (2009) and Bettin and Zazzaro (2012), both of which indicates a complementarity effect of remittance and financial development. We concluded that remittance's relationship on the growth of economies is positive, and that it works complementarily with financial development to foster the growth of economies.

ABSTRACT (KOR)

해외송금의 증가 추세와 규모, 그에 대한 의존성으로 인해 오늘날 해외송금은 국제자본 시장에서 중요한 외부금융의 원천임이 입증되었다. 나아가, 이러한 해외송금이 금융발전 등과 같은 일반적인 경제 요인들과 상호작용을 하며 경제성장에 있어 얼마나 지대한 영향을 미치는지에 대한 다양한 연구가 경제학자들에 의해 수행되기도 했다. 본 연구는 최근 30년간의 64개국 패널 데이터를 활용하여 해외송금과 경제성장 사이의 상호 연관성, 그리고 해외송금, 경제성장, 금융부문 발전의 복합적인 영향을 살펴보고자 시도되었다. 또한 해외송금이 금융발전에 있어 보완적 수단인지 혹은 대체적 수단인지에 대해서도 분석하였다. 분석기법으로는 잠재적인 내생성의 문제를 통제하기 위해 System-GMM을 활용하였다. 연구결과에 따르면 해외송금은 그 자체로 경제성장에 있어 긍정적이기도 하지만 동시에 큰 영향을 미치지 않는 것으로 나타났다. 그러나 금융부문 발전과의 상호작용에서 유의미한 것으로 나타났으며, 이는 상호작용 항(Interaction terms)의 양의 계수에 의해 입증되었다. 이는 Mundaca(2009), Bettin과 Zazzaro(2012)의 이전 연구들의 가정에 대해 신뢰를 더하며, 이 두 연구들은 모두 해외송금과 금융발전 간의 상호보완성 효과를 가리키고 있다. 본 연구의 주요결과를 살펴보면 첫째, 해외송금은 경제성장과 양의 관계를 가지는 것으로 나타났으며, 둘째, 해외송금은 경제성장 촉진에 있어 금융 발전과 상호적으로 작용하는 것으로 나타났다.

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ACRONYMS

AB	Arellano and Bond
ARDL	Auto Regressive Distributive Lagged
ECM	Error Correction Vector
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
IFS	International Financial Statistics
IMF	International Monetary Fund
IV	Instrumental Variable
OLS	Ordinary Least Squares
sGMM	system Generalized Method of Moments
UIS	UNESCO Institute for Statistics
VCEM	Vector Error Correction Model
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

1.1 Background

In recent times, remittances have proven to be of extreme significance to international capital inflows. For example, over a ten-year period from 1998 to 2008, there has been an enormous 954.7% increase in inflows from remittances into developing and underdeveloped countries (World Bank, 2010). In 2018, global migrant remittance increased by 12% to an estimated US$689 billion from US$633 billion in 2017 (World Bank Group & KNOMAD, 2018). This growth in the volume of remittances can be loosely attributed to an increase in migration. For instance, over the years, several nationals from less developed countries have migrated from impoverished conditions to more developed nations in search of job opportunities, freedom, and access to basic and/or advanced social services. The number of sub-Saharan Africans living in Europe grew by 30% from 2010 to 2017 and the same rose in the United States by nearly 214% (Pew Research Center, 2018). As a share of the aggregate global population, migrants grew from 2.8 percent in 2000 to 3.4 percent in 2017. At this growth rate, it was reported that the global migrant stock grew faster than the aggregate global population (The United Nations Department of Economic and Social Affairs, 2017). As migration increases, it is typical for remittance to likewise increase because many immigrants who secured jobs in developed countries customarily remit their income to their home country. Sub-Saharan Africa saw about 10% increase in remittances which brought remittances of the region to US$46 billion in 2018 (World Bank Group & KNOMAD, 2018). During the same period that remittances increased, the African Development Bank also reported a faster-than-envisage growth in the African economies from an estimated 3.6 percent in 2017 to 4.1 percent in 2018 and 2019 (African

Development Bank (AfDB), 2018). In 2018, driven by a vibrant economy and a semblance of employment stability in the United States as well as a recoil in external flows from some Arab states and the Russian Federation, there was a regional upsurge in the flows of remittance in South Asia from seven percent to twelve percent (World Bank Group & KNOMAD, 2019). Remittance sent to countries that have been categorized as low and middle-income is estimated to have increased by 9.6 percent from 2017 to 2018, reaching a record high of US$529 billion. From its inception, remittances have grown every year in succession, except for after the global financial crisis of 2008 and 2009, when the lowest growth rate was reported.

Owing to the increasing significance of migrants' remittance to international capital inflows and the increased volume of global remittance, this subject has garnered considerable interest in contemporary discussions. Several studies have examined the cumulative trend of remittance to the international flow and its effect on the growth of economies (Barajas et al., 2009; Shera & Meyer, 2013) infant mortality (Kanaiaupuni & Donato, 1999; López Córdova et al., 2006) and reduction in poverty (Adams, 2004; Chimhowu et al., 2005) amongst others. Mundaca (2009) established that migrant remittance and economic growth have a significant positive relationship.

The growth of developing economies may be enhanced by remittance via different conduits (Loxley & Sackey, 2008; Pradhan et al., 2008; Ziesemer, 2006). Households in recipient countries may use remittances as an expenditure on the consumption of goods and services or as savings. If families in recipient countries use remittances as an expenditure on goods and services, the demand for goods and services in the recipient country increases due to the increase in the purchasing power of consumers. In this case, the multiplier effect suggests that the overall economy would become better off as industries would also supply more goods and services to meet the demand. Thus, there would be an increase in economic growth (Stahl & Habib, 1989; Taylor & Dyer, 2009). On the other hand, when families choose to use remittances as savings or

transitory income, they may well use the financial sector of the country to turn their savings into productive investments (Levine et al., 2004). This will enhance the growth of the economy of the recipient country. The treatment of migrant remittances as transitory income makes it essential to comprehend the correlation between remittance and the growth of economies while simultaneously observing the advancement of the financial sector through which remittance formally flows.

Some studies have also examined remittance and the growth of economies while taking into account the growth and advancement of the financial sector. For example, (Karikari et al., 2016) used Panel Vector Error Correction Model causality techniques to observe 50 developing economies from 1990 to 2011 and discovered that remittance promotes the advancement of the financial sector. (Anh Tu et al., 2019) employed two strategies to investigate the impact of remittance influx, financial inclusion, and the growth of economies, implying the possibility that remittance inflows may contribute to the robustness of the financial sector. They used generalized method of moments with a rigorous control for endogeneity and a structural equation model.

However, our interest in this topic transcends the traditional remittance-financial development-growth connexion, although it is a relationship we will further explore. Our curiosity, then, is predicated upon previous studies such as the 2012 study of Nyamongo, Misati, Kipyegon, and Ndirangu, the 2012 study of Bettin and Zazzaro, and more strongly based on the most recent 2019 study of Bangake, Eggoh, and Samedo. In each of these studies, the non-linearity of the remittance-financial development-growth relationship is firmly established. To a greater extent, the latter, nonetheless, focused on the threshold effects of the remittance-growth connexion, positing that at an optimal level of financial sector advancement, a significantly positive relationship exists between migrants' remittances and the growth of economies, and insignificant otherwise. While we are unable to include as many countries as possible from

sub-Saharan Africa, the topmost inspiration behind this research is the desire to see an enhanced and sustained economic growth trend particularly in Liberia and other sub-Saharan African countries, with a GDP accounted for by a large proportion of remittance inflow.

1.2 Objectives of the Study

Although some connections have been made between remittance, financial development, economic growth, there is still an existential need for deeper examination and study of the subject matter. This research paper works toward interposing to the discussion and adding to existing literature by using a 64-economy up-to-date panel data set to further analyze the connexion between migrant remittances, the advancement of the financial sector, and the growth of economies. Primarily, our study pursues to contribute to better understanding of the correlation between migrant remittances and economic growth while considering its interplay with financial development. The selected countries are ideal for this study because remittance to each of these countries in the past few years accounts for at least one percent of their GDP. Additionally, the relative financial openness of these countries ideally facilitates the observation of a collaborative effect between migrants' remittances and the advancement of the financial sector.

We will observe the connexion between migrant remittances and the growth of economies as well as the combined effects of migrants' remittances and the advancement of the financial sector on the growth of developing economies.

1.3 Research Questions

At the conclusion of this study, we hope to provide answers to the following research questions:

1. What relationship, if any, is there between migrants' remittances and the growth of developing economies?

2. What effect do migrants' remittances have on the advancement of the financial sector of the receiving countries?

3. What effect, if any, does the advancement of the financial sector, the presence of remittance, have on the growth of developing economies?

1.4 Scope and Data Source

To facilitate rigorous measurement of the dependent variable and to control for endogeneity of the independent variables, the generalized method of moments procedure developed by Blundell and Bond (1998) will be employed. However, a major difference between this study and the most recent and previous studies is the application of both quantity and quality-based proxies of the financial sector in our analysis.

1.5 Organization of the Study

This paper contains five chapters. The remainder of this paper is in the following structure: In Chapter 2, we will explore existing scholarships and research that elucidate the general effect of overseas remittances on the growth of economies. In this chapter, we will also use available economic data on developing countries to observe remittances' impact on the growth of their economies. In Chapter 3, we will develop and explain a model to test the connexion between remittances and the growth of developing economies, as well as the connexion between remittances, the advancement of the financial sector and the growth of developing economies. Empirical analysis and discussion of the findings will be covered in Chapter 4 and policy recommendations will be proffered in Chapter 5.

Table 1.1: List of Countries and Highest percentage of Remittance for a given Period

Country	Remittances (% of GDP)	Peak Year	Country	Remittances (% of GDP)	Peak Year
Algeria	3.3	1994	Kenya	4.53	1999
Bangladesh	9.75	2008	Malawi	2.83	2019
Barbados	4.25	2001	Malta	5.23	2004
Benin	8.04	1992	Madagascar	4.56	2010
Bolivia	8.04	2007	Malaysia	0.80	2007
Botswana	2.25	1990	Mali	6.75	2013
Brazil	0.44	1992	Mauritania	1.14	2017
Burkina Faso	5.75	1992	Mauritius	4.31	1998
Cameroun	0.90	2017	Mexico	3.05	2019
Colombia	3.25	2003	Morocco	8.51	2007
Congo Rep.	0.43	2001	Mozambique	2.0	2019
Comoros	14.64	2018	Nicaragua	13.46	2019
Costa Rica	2.31	2007	Niger	2.39	2019
Côte d'Ivoire	1.56	2011	Nigeria	8.31	2005
Chile	0.03	2009	Pakistan	8.0	2019
Dominica	8.92	2018	Panama	1.39	2010
Dominican Republic	8.34	2019	Paraguay	2.50	2006
Ecuador	7.21	2000	Peru	2.08	2007
Egypt	14.58	1992	Philippines	12.13	2006
El Salvador	21.8	2007	Rwanda	2.70	2018
Ethiopia	1.82	2007	Saint Lucia	2.08	2018
Fiji	6.76	2005	Senegal	10.69	2019
Gabon	0.16	2014	Seychelles	2.37	2011
Ghana	6.05	2019	Sierra Leone	2.0	2011
Guatemala	13.89	2019	South Africa	0.25	2019
Guyana	11.54	2012	Sri Lanka	8.86	2014
Haiti	23.21	2019	Sudan	7.0	2003
Honduras	21.52	2019	Thailand	1.60	2014
Hungary	3.24	2016	Togo	10.7	2007
India	4.16	2008	Tunisia	5.28	2019
Indonesia	1.56	2006	Turkey	2.21	1997
Jamaica	17.28	2016	Venezuela	0.12	2004

Source: *Author's calculations based on data sourced from the WDI database*

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

We will present a detailed review of both theoretic and empirical scholarships on the link between remittance, the advancement of the financial sector, and the growth of economies in this chapter. We further review both pessimistic and optimistic views of remittance's effect on growth and other recent literature that explore the interactive impact of both variables on growth.

The remainder of this chapter is in the following structure: Section 2.2 defines remittance, section 2.3 examines the theoretical framework used to determine the motivations for remittance, section 2.4 discusses the connexion between migrants' remittance and the growth of economies, highlighting both micro and macro-economic effects, section 2.5 explains the connexion between the advancement of the financial sector and remittance in the spirit of the substitutability and complementarity hypotheses, section 2.6 used the "demand following" and "supply leading" hypotheses to explain the connection between the advancement of the financial sector and economic growth, section 2.7 discusses the connexion between the three variables and section 8 concludes the chapter.

2.2 Definition of Remittance

Remittances have been conceptualized from various perspectives. In its definition of remittance, the World Bank theorized remittance to include personal transfers and compensation of employees. Conversely, the International Monetary Fund (IMF) claims that migrants' transfers are in most instances dissimilar to remittances, and it is disingenuous to have it included in the definition of remittances. Hence, migrants' transfers are excluded from the IMF's

conceptualized definition of remittance. Previously, the IMF had classified migrant workers' remittances into three distinct categories: Workers' remittances, which are classified as a component of existing transfers in the current account, transfers by migrants, classified as fragment of the capital account and employees' remunerations, which are categorized as being inclusive of the income component of the current account (Mim & Ali, 2012). Nevertheless, in simple terms, this paper would define remittance as the money transferred by a foreign worker or resident to one's home country. This definition is acceptable and consistent with the study of Ofeh and Muandzevara (2017) which defined remittance as the funds sent by foreign workers to the countries from which they hail.

2.3 Motivations for Remittance

Cardinal to the analysis of remittance's connexion with and its effect on growth in the destination countries, is examining and understanding the fundamental impetuses for funds transferred in the form of remittances from migrants. A framework popular and widely used amongst researchers for this purpose is that which was developed by Lucas & Stark (1985). A remitter is both socially and economically incentivized to transfer money to his home country. But fundamental of all motivations for which one remits may be altruism (Sana & Massey, 2005; Stark & Lucas, 1988) and self-interest (D. Cox et al., 1998; Durand et al., 1996; Poirine, 1997).

(a) Altruistic Motive

The raison d'etre for unselfish motivation for remitting money, amongst other things, may be to alleviate poverty and to protect the recipient families against income shocks or famine, both of which affect the welfare of the beneficiaries. Migrations from developing countries to developed ones are often driven by poor socio-economic conditions in the home country, where the per capita wage is significantly lower than in developed countries. Hence, migrants travel to seek better job opportunities and higher wages and to ultimately remit money back home to

support their family. This is true for many developing and underdeveloped countries. For example, in Liberia, migrants' families use remitted funds as household subsidies. Tuition fees, food, transportation, medical bills, necessary household items, utility bills, amongst others are settled by funds remitted by migrant family members in the United States, United Kingdom, and other countries around the world. This is not distinctive to Liberia. Migrants from several other countries like Liberia, including Sierra Leone, Guinea, Ghana, Nigeria, and others remit funds for the same reasons.

(b) Self-Interest Motive

The sender may also remit for selfish reasons such as payment towards services rendered to the remitter, caring for remitter's children, loan settlements or payments towards the purchase and preservation of land or other assets (D. Cox, 1987; De & Ratha, 2012). In any case, Lucas and Stark (1985) suggest that remittance is sent because the sender obtains fulfilment from the welfare of beneficiaries at home or his/her personal business. Dustmann and Mestres (2010) indicates that how one emigrated to a host country is essential to their motivation to remit. Migrants who intend to go back home to the destination country have a distinct behaviour or purpose for remitting and remit differently than those who anticipate permanent residence in the host country. As previously indicated, the search for 'greener pastures' in the form of better employment opportunities and higher standard of living are principal motivations for several individuals who migrate to developed countries. In some cases, these individuals may have put a lien on their properties by securing a personal loan from a bank or from individuals to facilitate their migration. Many of them remit money to fulfil their agreement to repay these loans and to reclaim their collaterals which were used to secure them. In other instances, migrants remit money to build homes, start businesses or other profit-making ventures to augment their income they make and to prepare a good life for when they decide to return to

their country. This instance is an incentive to remit for many, such as international students and those with short-term visas, who expect to return home.

Notwithstanding the motivation of the remitter, remittances have proven to be a considerable component of the global economy. What may seem like diminutive amounts in the form of a few hundred dollars remitted to low-income countries in South-Saharan Africa and other remittance receiving regions, may overtime, add up to billions of dollars, making up a significant portion of the global GDP.

Due to its extreme significance to the international capital inflows, the link between remittance and the growth of economies and the effect of the former on the latter, has, in recent years, attracted considerable attention from researchers. The heightened interest in the subject matter is evidenced by a growing body of literature which examines the extent to which remittance affects growth, significant or otherwise. Some of these papers have primarily focused on such aspects as the significance of migrant remittances on the destination countries, the majority of which are low and lower-middle income nations; and the economic and social hazards associated with a huge inflow of remittances as well as the macroeconomic effects of remittance in a politically stable environment (Adams, 2011; Amuedo-Dorantes, 2014; Shera & Meyer, 2013). Yet, there has been varying views about remittance's influence on growth. Some researchers believe that remittance has very little positive statistical significance on growth (Stojanov et al., 2019), others have contended that remittance has a strong positive significance on growth (Giuliano & Ruiz-Arranz, 2009a; Jayaraman et al., 2011) while others hold that remittance has negative or no significant impact on growth (Barajas et al., 2009; Sarkar & Datta, 2014).

A review of the empirical papers shows that a far-reaching interest has been devoted to examining the connexion between remittances and financial development and to conducting

econometric tests and ascertaining the impact of these variables and other macroeconomic variables on the growth of economies. Today, the financial system is a formal transmission channel for remittances. Yet, the impact of an interactive effect between the two variables on economic growth in especially low, lower and lower-middle income countries have not been given adequate interest and priority. An understanding of the channel via which the growth of economies is affected by migrants' remittances is imperative for devising policy that will augment remittance's impact. Hence, this study seeks to contribute to the existing literature by using up to date information to run empirical analysis to ascertain the remittance, the advancement of the financial sector, and the growth of economies nexus and to proffer relevant policy recommendations.

2.4 Remittance and the Growth of Economies-The Nexus

As the literature has shown, in recent years, remittance inflows have become larger and have outperformed aid transfers. However, the World Bank (2011) found that it is close to impossible to truly estimate the magnitude of remittance inflows especially in Sub-Saharan Africa since substantially greater than 50 percent of inflows in the region are transmitted through informal channels. Remittance is said to be transmitted through official channels if the transmittance involves the use of local or international banking systems or other fund transfer services such as Western Union or Money Gram. When remittances are transmitted through the banking system, positive impacts on the financial sector ensues. However, remittance's effect on growth, positive or negative, significant, or otherwise, is still a matter of dispute amongst researchers. Proponents of the argument that remittance affects growth have employed various models to establish their claims. For example, Mundaca (2009) establishes that a significantly positive connexion exists between migrant remittance and the growth of economies. Muhammad et al. (2011) examines the bearing of remittance on the growth of economies with GDP as a proxy. In their study, they used a simple log linear regression model

to observe 2 countries over a 16-year period and found that remittance positively affects the growth of economies. Other proponents include Giuliano and Ruiz-Arranz (2009a); Jayaraman et al. (2011); Oshota and Badejo (2015) and Shera and Meyer (2013) all of whom used Panel OLS to observe 100 countries over a 27-year period, Bound test to observe 2 countries over a 27-year period, Error Correction Model (ECM) to observe Nigeria from 1981 to 2011 and Auto Regressive Distributive Lagged (ARDL) and ECM to observe Albania from 1992-2012 respectively and they all found that the growth of economies is positively impacted by remittance.

All these writers agree that the portion of remittances invested in productive activities would positively affect growth in the economy. From the African and developing countries' experience, remittance tend to ease the economic burden on the poor; it enables poorer households to invest in human capital by paying fees at school and grants them access to healthcare, which would otherwise be difficult to obtain.

On the contrary, proponents of the argument that remittance has negative or no impact on growth have also employed various econometric models to defend their claim. A chief defender of this assertion, Chami et al. (2003), using a Panel OLS model, conducted a study of 113 countries from 1970 to 1998 and found that remittance negatively affects growth. They found remittance and growth to be compensatory. Using OLS and instrumental variables methods, they establish a negative connexion between per capita GDP growth and remittance. Nevertheless, attributable to potential issues of endogeneity between two of their variables, per capita growth in real income and remittances, an Instrumental Variable regression was conducted, albeit yielding inconclusive results.

Remittance has diverse impacts on the economy. Chami et al develops a unified model to assess these impacts and finds a negative effect on per capita incomes in real terms as a result of

perverse incentives. Country specific characteristics, such as the political environment, financial openness, and corruption level, etc, that influence remittance effect on growth vary if taken as a cross-country dataset. And because the unified model does not account and control for the varying individual characteristics that may influence remittance effects on the growth of the economy of each country in a cross-country dataset, the results yielded were inconclusive at best. This signifies that remittance's impact on growth can be clearly understood if analyses are conducted on a country-by-country basis. Karagöz (2009) also used Cointegration and OLS to observe Turkey from 1970 to 2005 and unearthed a negative connexion between migrants' remittances and the growth of economies. Other researchers like Sobiech (2015) used the GMM Panel Analysis to observe 54 developing countries and found a negative relationship and Sarkar and Datta (2014) used ARDL and causality to observe Bangladesh from 1975 to 2011 and found no relationship between the two variables of interest.

Given a review of individual and household data and a review of country-level data, micro and macro-economic impacts of remittance on growth can be adequately assessed. From a microeconomic perspective, the impact of remittance on growth will be evident from the enhancement and stabilization of household income due to remittance inflows. The inflow of remittances to households especially in developing countries may ease budgetary constraints of struggling households, enhance what in labour economics may be termed as reservation wages, as workers may accept or reject available jobs predicated upon their comparison of the wages with the volume and/or amount of remittance they regularly receive from family members abroad. By means of an effect on income, it may also diminish the probability of employment and the remittance-receiving individuals' labor hours.

Using the framework of a model that correlates altruism and a motivation to receive bequest, Grigorian and Melkonyan (2011) investigated the microeconomic implications of remittances. They consider a scenario where the two parties, the migrant (m) and the representative relative

(r) can contrive a self-enforcing arrangement to pick alternatives that increase their aggregate surplus. Employing alternative estimates regarding the changing aspects of remittance and other endogenic variables, they further show that different results are produced under cooperative and non-cooperative solutions. They identified a solution to be cooperative where the extent to which the counterpart's objective is embodied by m and r is a response to their altruism and how much the value placed on potential utility, and it is non-cooperative contrariwise. They suggested a responsibility for policy methods in determining the streams of remittance and the extent to which the behavior of households is impacted by it. They posit that a recipient's choice to expend the funds received or invest it in other areas is affected by the interest rate which can be regulated by adequate measures of policy.

On the other hand, the influence of remittance on the aggregates of an economy is still an ongoing debate amongst researchers. Some researchers believe that the actual effect of remittance on the economy is predicated upon the sender's motivation to remit. It has been suggested that if the sender is philanthropic, then a plunge in the economy of the receiving country would propel the sender to remit more in order to support their families' consumption behavior. Conversely, if the sender is motivated by self-interest, then remittance will positively affect growth as the sender will seize investment opportunities which may lead to an enhanced state of the economy (Lucas & Stark, 1985). However, from a review of the related literature, they all do agree that remittance inflows contribute a large chunk to the global GDP and that understanding the connexion and impact of remittance on the economic aggregates is critical for policy makers to respond appropriately to the inflows.

In their study, Durand et al. (1996) sought to identify factors prompting Mexico-US migrants to send funds to their country and make productive investments. They also sought to understand the variables determining the amount remitted and the relative share of the amount returned as savings as opposed to remittances. They found that migrants do not spend unrestrainedly and

detrimentally, but they do their utmost to improve the welfare of their families given their socio-economic constraints. Nevertheless, they concluded that remittances are primarily used for consumption which prompts an increased demand for goods and services.

A survey of more than 6000 self-employed personnel and micro firm proprietors in 44 metropolitan regions of Mexico was conducted by Woodruff and Zenteno (2007) and they find evidence that migration, from which remittance is prompted, is linked to heftier investment and greater ratios of capital to output amongst micro enterprises in Mexico. This means that the funds remitted by migrants have the propensity to stimulate investment in small businesses and firms, which essentially contribute to the stability of the aggregates of the economy.

A. Cox et al. (2003) also employed the Cox comparative hazard model to study the factors contributing to school attendance. They measured the income using remittance as a basis and they found that school retention is both largely and significantly impacted by the variable. They postulate that even if parents have very little education and live in poor areas, remittance can be used to substantially subsidize school attendance. This indicates that the funds remitted by migrants also have the propensity to contribute to human capital investment, which is a principal macroeconomic indicator.

The three studies examined in the preceding paragraphs show that remittance can contribute to consumption prompting an increased demand for goods and services, remittance can also enhance investment in small businesses and firms as well as in human capital development. Undoubtedly, these variables can generate a larger impact on the aggregates of the economy through the multiplier effect.

Conversely, a wide range of studies postulate that remittance negatively affects the aggregates of the economy with some researchers even concluding that in particular, the labor effort of the recipient or receiving household is most notably and negatively affected (P. A. Acosta et al.,

2009; Chami et al., 2006; Funkhouser, 1992). Amuedo-Dorantes (2014) took an objective stance on the matter. The study agrees that remittance can enhance the lives of families and enhance the growth and stability of the economic aggregates in the receiving country. However, they can also "create a culture of dependency in the receiving country, lowering labor force participation, promoting conspicuous consumption, and slowing economic growth." (p. 1)

Most studies which conclude that remittance and growth are negatively correlated are subject to faulty models. For example, The International Bank for Reconstruction and Development and The World Bank (2006) found the model used by Chami et al. (2003) to be ineffective and the model was rectified to include essential institutional variables which were otherwise not included in the model built by Chami et al. (2003). Resultantly, the study disagrees with Chami et al. (2003) and accentuates that remittance will lead to significant growth irrespective of whether it is used for consumption or investment.

However, several other studies have suggested that the extent to which remittance affect the macroeconomic variables of an economy largely depends on the economic dynamic of the country being considered (Durdu & Sayan, 2010) or the use of the funds by the receiving household (Ghosh, 2006). Ghosh (2006) contravenes Durand et al. (1996) and posit that the growth of economies is promising if migrants' remittances are utilized for investment as opposed to if they are used solely for consumption purposes.

Regardless of how they are used, demand for goods and services in the country receiving remittance is expected to be stimulated as the level of remittance increases, thereby affording a surging strain on production. Nonetheless, in view of the fact that receiving homes are also expected to respond to the boosted income in the form of remittance by "procuring" additional leisure along with more consumption, the initial contribution to overall productivity may possibly be enhanced or upended (Chami et al., 2008).

2.5 Remittance and Financial Development Nexus

In addition to the overwhelming attention drawn to the causative connexion between migrants'
remittance and the growth of the economy, there has also been considerable interest in the
advancement of the financial sector and its role in the growth of economies. In general terms,
Choong and Chan (2011) defined Financial Development, otherwise described in this paper as
the advancement of the financial sector as "the enhancement of the quality, capacity and
efficacy of financial intermediary services" (p.3).

There are two hypotheses that explain the nexus of migrants' remittances and the advancement
of the financial sector: the substitutability hypothesis and the complementarity hypothesis.
Using a cross-sectional sample of 73 countries, Giuliano and Ruiz-Arranz (2005) tested a
substitutability hypothesis of the relationship between migrants' remittances and the
advancement of the financial sector. They established that an enhanced improvement in
financial development diminishes the strength of remittance inflow to create investment, while,
on the other hand, they found remittance to significantly impact growth in financial sectors that
are not as efficient or developed. The findings in their paper were construed to denote that in
financial markets that are under-developed, remittances may contribute and augment
entrepreneurial activities where the entrepreneur faces credit constraints due to inability to
provide collateral. Contrarily, a well-developed financial sector affords investors the
opportunity to access credit through formal channels.

In their policy research working paper that uses a large cross-country panel dataset to observe
emerging economies in Latin American and the Caribbeans, the substitutability hypothesis was
additionally supported by (P. Acosta et al., 2007). They conclude that Argentina, Peru and
Brazil respectively, would experience a growth rate of 0.46, 0.39 and 0.31 percent if
remittances increase by one standard deviation. The results were provided in this order because

financial markets in Brazil are more developed than those of their Peruvian counterparts accompanied by financial markets in Argentina.

Nevertheless, using a dataset on the inflows of remittances from 99 countries over a span of about 29 years, an antithetical hypothesis to the substitutability hypothesis was offered by Aggarwal et al. (2006). Although there is little or no empirical data to support the posited hypothesis that financial development is negatively impacted by remittances, in their paper, they contended that trust in financial institutions is key to boosting deposits. People will not deposit received remittances if they distrust financial institutions and as such, remittances will fail to impact financial development. They furthered that remittances received in developing countries have been found to be primarily spent on consumption. Spending remittances mainly on consumption would undermine the role of remittances to create credit lines.

In contrast to the substantiation of substitutability between the influx of remittances and the advancement of the financial sector in fostering the growth of economies, two researchers Bettin and Zazzaro exploited a panel data set of 66 emerging economies over a 15-year period. They used the efficacy of the local banking system as a quality-based indicator to indicate that economic growth is only fostered by remittances if the financial system of the receiving countries is efficient. Their use of a quality-based indicator suggests the existence of complementarity hypothesis (Bettin & Zazzaro, 2012). In the book "Beyond Small Change: Making Migrant Remittances Count", ZÁRATE-HOYOS (2005) also contended that improvement in the financial development of a migrant receiving country would encourage migrants to make funds transfer. By this argument, they supported the verity of the complementarity hypothesis. Gupta et al. (2007) assesses the influence of remittance flows on poverty and the advancement of the financial sector of the Sub-Saharan African region. They reached the conclusion that a reduction in the transfer fees can significantly boost remittances.

The proliferation and success of several contemporary money transfer services adduce evidence to the position that reduction in the transfer fees and the ease thereof can boost remittances. For many years, money transfer services such as Money Gram and Western Union were the leaders in the sector. Arguably, because of their longstanding leadership in the sector, their well-recognized brand, and stringent Anti-money Laundering and Counter Financing of Terrorism policies, they are still considered the leaders in the industry and are recommended by financial pundits. But one cannot ignore that money transfer services later joining the market may have enhanced the financial sector development as well as promoted financial inclusion in many developing nations. For one fact, the sending fees of most of these services are fixed irrespective of the sending amount and they are also available for use 24 hours a day through handy mobile applications, making it not only cheap, but also fast and easy to remit money. For example, G Money Trans, which is remarkably popular amongst foreigners in Korea has a fixed sending fee of 5000 Korean won or US$ 4.37. Other services include GME Remittance and SentBe, which have been deemed safe for money transfer amongst foreigners and are frequently used for this purpose. Quite recently, SendWave was developed primarily to target the remittance market in nations situated in the west of Africa, such as Liberia, Sierra Leone and Guinea, all of which are countries with a considerable share of its GDP attributed to remittance inflow. For countries with a digitized economy, financial inclusion and the overall financial sector may be promoted through these means. This recent wave of money transfer services development targeting the remittance market in developing economies makes it even more essential to understand how the inflow through the financial system affects growth in these nations.

In a similar study of 36 Sub-Saharan countries over a span of 30 years, a panel estimation was employed by Nyamongo et al. (2012) to analyze the connexion between remittances and the growth of economies. In addressing the non-linearity of this connection, they unearth that

remittances seem to be operating as a complement to the advancement of the financial sector. Employing the use of IVs and a typical cross-section model for growth, Hassan et al. (2012) also examined the connexion between remittances and the growth of the economy in the South Asian country of Bangladesh. The study finds that initial growth reacts negatively to remittance. However, at a subsequent stage, the growth reacts positively, which is a compelling substantiation of a non-linear relationship. When a complementarity analysis of remittance and the advancement of the financial sector was included, growth was further shown to be positively. This complementarity effect between migrants' remittances and the advancement of the financial sector with respect to the growth of economies is also found by Cooray (2012) over the period 1970-2008 from a sample of 6 South Asian countries.

By examining the evidence of the complementarity hypothesis, we can draw some major conclusions. First, the financial system becomes more developed as the necessity increases for financial commodities ranging from the opening of accounts at banking institutions to the possession of debit or credit cards. Second, if what is received by the recipient is in excess of what is needed, the excess of the remittance may be saved in banks. This will enhance domestic resource mobilization. A third conclusion we can draw is, a person may become eligible for bank credit if they regularly receive funds through their bank account in the form of remittances. Hence, the size of the credit market is expanded. Fourth, regular inflows of remittances may motivate investors to view the market as a potential sector for profit making. This would encourage competition as banks would normally desire a large share of profit in the sector and would thereby seek to encourage transfers by reducing its associated fees and cost.

2.6 Financial Development and Economic Growth Nexus

The empirical correlation between the two variables has been widely studied using various data types obtained from developed and developing nations. This relationship was examined as

early as 1934 by Austrian Political economist Joseph Schumpeter. In Schumpeter (1934), he deliberated the importance of the advancement of the financial sector in promoting the growth of economies. Technical innovations and the adequate and appropriate allocation of limited resources across production activities are pivotal to the enhancement of economic activities which promote growth. Schumpeter (1934) specified that technical innovations can be encouraged, and productive capacity can be enhanced with a well-functioning financial system. Correspondingly and in a later study, King and Levine (1993) indicated a meaningfully positive impact of an effective financial system on economic growth. Exploiting information from about 80 countries over a period of thirty years, they presented a cross-country evidence coherent with Schumpeter's school of thought that a financial sector that is advanced and effectual can stimulate growth in the economy. In their examination, they also found strong associations between financial development, real GDP growth per capita, the rate at which physical capital is accumulated, and enhancement in the effectiveness with which economies put the accumulated physical capital to use. Future rates of economic growth were also found to be robustly correlated with the predetermined component of financial development.

Two vying hypotheses regarding economic growth and financial development have, through empirical observation, been explored in the perspective of "demand following" and "supply leading" finance (Murinde & Eng, 1994; Patrick, 1966). The demand following supposition hypothesizes a positive, yet causative connexion from the growth of economies to the advancement of the financial sector while the supply leading supposition proposes a positive, yet causative connexion from the advancement of the financial sector to the growth of economies.

In his investigation of these hypotheses, Patrick (1966) argued that in the 'supply leading' hypothesis, causation paths from the advancement of the financial sector to the growth of economies whereas 'demand following' hypothesis suggests the reverse.

2.7 Remittance, Financial Development, and the Growth of Economies-The Relationship

Determining the effect of migrants' remittances on the growth of economies by examining and measuring the advancement of the financial sector is still obscure and at best, ambiguous in contemporary scholarships.

Giuliano and Ruiz-Arranz (2009b) commissioned a research to analyze the connexion between migrants' remittances, the advancement of the financial sector, and the growth of economies. Employing data from about 100 developing countries, the pair used the system generalized methods of moments regression (SGMM). From the result of the study, it was stipulated that countries with less developed financial sector experience a significantly positive influence on the growth of economies, which was exerted by remittance inflow as it provided an ancillary means to investment subsidization and to the alleviation of liquidity-related challenges.

In contrast to Giuliano and Ruiz-Arranz's study of 2009, OLS and SGMM estimation methods were employed by Bettin and Zazzaro (2012) to examine and ascertain the relationship and effect of remittances and the advancement of the financial sector on the growth in 66 economies over a 35-year period. The results from the study suggest that remittance only enhance growth in nations with a well-functioning financial sector and proves otherwise in nations with inefficient financial sectors. This indicates that the impact of remittance and the advancement of the financial sector on the growth of economies is complementary.

Using Lesotho's macroeconomic data from 1975-2010, Sibindi (2014) applied the VCEM and Granger causality to investigate the link between migrant remittances, advancement of the financial sector, and the growth of economies. Outcome from the study denotes that the path of causativeness goes devoid of feedback from migrants' remittances to the growth of economy as used in the research. In harmony with the supply-leading growth hypothesis, the study additionally posits that advancement of the financial sector Granger influences growth of

economies devoid of feedback and further confirms that the same variable influences remittance inflow devoid of feedback. The result supports the "complementarity' hypothesis as it indicates that remittances complement the advancement of the financial sector in promoting the growth of economies.

Nyamongo et al. (2012) used panel data from 36 sub-Saharan countries to examine the role remittances and the advancement of the financial sector on the growth of economies over a 30-year period. They found a significantly positive effect of migrants' remittance on the growth of economies while, at least for the countries that were examined, it was also determined that financial sector advancement weakly influences growth, indicating that economic growth is not caused by the advancement of the financial sector.

In the same vein, employing a dataset of 39 countries over a 33-year period, Mundaca (2009) analyzed the link between the advancement of the financial sector and the growth of economies and reported a result that supports the complementarity hypothesis between migrant remittances and the advancement of the financial development in enhancing the growth of economies.

It could not be more apparent that several researchers have used different methodologies to examine this subject. A dynamic panel estimation was utilized by Chowdhury (2016) on a dataset from 33 leading remittance-receiving countries over a period of thirty-three years (1979-2011) to examine how economic growth is influenced by remittances under various echelons of financial advancement. Research results suggest that the advancement of the financial sector has no bearing on the connexion between migrant remittances and the growth of the economy. However, remittance was found to effectively enhance economic growth, while proxies used in the study for the advancement of the financial sector were inconsequential to the promotion of growth. The study concluded that well-functioning and more developed financial systems have the propensity to increase the influx of migrant

remittances to a greater extent; conversely, growth of economies are not impacted by the collaborative effect of financial development and remittances.

2.8 Conclusion

Undoubtedly, an evaluation of the theoretic and empirical scholarships in this section of the paper indicates that the debate on the effect of remittance on the growth of economies while considering the advancement of the financial sector, or the discussion on the interactive impact of migrants' remittance and the development of the financial sector on growth is far from over. This study will contribute to the discussion in the following ways:

1. We will analyze the connexion between migrants' remittance and the growth of economies. Then we will examine how the growth of economies by migrants' remittances by considering different stages of financial development. To do this, we will explore the interactive effect of the same variables on growth by utilizing a panel data set of 64 countries over a period of 30 years (1990-2019). The selection of the countries is predicated upon their increase in remittance inflows in the last few decades. By using an up-to-date panel data set and other effective econometric methods as subsequently discussed, we can control for unobserved country specific effect and endogeneity which might contribute to bias in the coefficient estimates.

CHAPTER THREE

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 Introduction

In this chapter, we describe the variables we use in this study, including but not limited to our explained variable, other variables of interest as well as supplementary control variables. Our econometric approach and the models we utilize for conducting our empirical assessments are also discussed in this chapter.

The remainder of this paper is in the following structure: In Section 3.2, the framework upon which our theory is based is presented. Our variables used in this study will be presented and described in Section 3.3. The adopted empirical models applied for estimations in our study is presented, illustrated, and discussed in section 3.4. Section 3.5 outlines the raison d'etre for our choice of the econometric methodologies employed in the study, and section 3.6 synopsizes the chapter and concludes.

3.2 Theoretical Framework

The standard model adopted in this study is predicated upon the neoclassical Solow model of 1956. The Solow model is based on the assumption that capital, labor, and technology function to support production in a given economy. Nevertheless, according to Mankiw Gregory, Romer, and Weil, (1992), the model is limited in nature, which is evident by its failure to explain the differences in income across countries. To this end, several studies have adduced empirical evidence that suggests that growth can be explained by variables other than capital and labor. Some of such variables may include financial sector development, remittances, human capital, foreign direct investment, amongst others (King & Levine, 1993; Mincer, 1984; Okwu, Oseni, & Obiakor, 2020; Pradhan, Upadhyay, & Upadhyaya, 2008).

For example, Mankiw Gregory et al. (1992) as mentioned above, modified the Solow model to include human capital, and after incorporation of human capital into the traditional Cobb-Douglas production function, and using discrete time approximations, their model, is simplified into a general growth regression model that takes the form:

$$\Delta lny_t = \gamma lny_0 + X'_t\beta + \varepsilon_t$$

(3.1)

Where the matrix of variables that render effect on growth is represented by X'_t, the stochastic term capturing the effect of the omitted variables is denoted by ε_t. Due to the freedom afforded by this form to test the effect of other factors on the growth of economies, this regression form is widely used by researchers in the empirical analysis of growth.

Given the premise that growth can be explained by other variables, we adopt the Solow model modified by Mankiw et. al (1992), where GDP growth is assumed to also be explained by the set of control variables we have employed in our study. In an effort to reflect the objective of our research in the panel structure of our dataset, we rewrite equation 3.1:

$$\Delta lny_t = \gamma lny_{it-1} + lnREM_{it} + lnFINDEV_{it} + X'_t\beta + \varepsilon_t$$

$$\varepsilon_t = \mu_{it} + v_{it} \text{ and } \gamma < 1$$

(3.2)

Where our variables of interest are respectively indicated by lnREM and lnFINDEV, denoting log of remittances of each country in our sample and log of each proxy making up the variable for the advancement of the financial sector. Time is represented by t, i denotes countries, X'_t represents a matrix of control variables we employed, the country effect and the idiosyncratic error term is represented by μ_{it} and v_{it} respectively.

3.3 Variables Description, Data Sources, and challenges

In this section, we will present the variables employed in this study, their sources as well as the rationalization for their use.

a. **Explained Variable**

Real GDP per capita growth rate: The growth of real GDP per capita in constant dollars is used as a proxy for the explanatory variable. The real GDP per capita is generally computed by expressing the GDP at steady prices over the population of a country. The growth rate of the same variable is then computed as the percentage change in the real GDP per capita between two successive years. The growth rate of real GDP per capita is an appropriate choice as it measures the average standard of living of residents in a country. Data for this variable is obtained from the WDI 2021.

b. **Explanatory Variables**

    i.   Lagged GDP Growth: There has been many an assertion that the GDP, which is the output variable of the economy and is used as such by many studies, is subject to what is termed as the 'power-law' memory effect. This means that GDP growth is dependent not just on its current state, but also on historical changes, trends or even growth from previous periods. Hence, we think it is essential to capture this effect as we measure the growth rate of the emerging economies in our study relative to the inflow of remittance and the advancement of the financial sector. Therefore, we have included lagged GDP growth as one of our variables we will use to explain GDP growth. It is herein specified as gdp-1, and it is obtained from WDI 2021.

    ii.   **Remittance**: Remittance is one of our primary variables of interest. Ad nauseam, the scholarship has not been sufficiently succinct in what is deemed

as remittances. However, as we have previously mentioned in the introductory paragraphs of this paper, the IMF has classified and computed remittances into two categories:

- Personal transfers- Funds transferred by a migrant who has resided in a country for at least one year are in this category.

- Compensation of employees-This category includes funds transferred by migrants who has resided in a host country for less than a year, but for at least three months.

We would be remiss, however, not to acknowledge the longstanding challenges associated with the collection of remittance data. Data collected for remittances is generally concentrated on funds sent via official banking channels. In the wake of the proliferation of non-bank financial institutions such as money operators and mobile money operators (popular in most sub-Saharan countries), and the emergence of online money transfer services which are popular amongst migrants in host countries, it is safe to conclude that remittance data exclusively gathered and estimated based on official banking data, is grossly understated. The World Bank recognizes that unofficial transfers and informal flows account for more than 50% of what is considered "official remittances" to several sub-Saharan countries (Eggoh et. al., 2019). Nonetheless, the data quality for remittance, the collection process, and the understatement thereof are all issues generally encountered by researchers of the subject matter. For this study, we adopt the IMF categorizations of remittance and we use the available data of the same. The data for this variable is obtained from the WDI 2021.

iii. **Financial Development**: Financial development is our second variable of interest. We use the four traditional proxies for the measurement of this variable.

- We use the proportion of domestic credit supplied by the financial sector to the countries' GDP as an estimation of how strong an intermediator the

financial sector is in the economy. It is stipulated in our study as Credit/GDP or dcred. Data for this variable is obtained from the WDI 2021.

- The proportion of domestic credit to the private sector to the countries' GDP is used to measure of the extent to which the private sector is dependent on the banks as financiers. This measure is believed to be a sign of a vibrant economy. The higher in value the measure of this variable is, the higher the flow of resources or funding to the private sector, and hence, the greater and more enabling an environment for the private sector to grow and thrive. As the private sector gets better and its national economy role gets bigger, the overall development and health of a country's economy also follow suit. We have selected this as one of our indicators because it portrays the extent to which the private sector cooperates with and supports the public sector. It is herewith stipulated as pcred. Data for this variable is obtained from the WDI 2021.

- In an effort to measure the extent to which the economy is monetized and to reflect the true size of an emerging economy, the proportion of money and quasi money (M2) to the countries' GDP is used. It is the equivalent of currency plus demand and interest-bearing liabilities of banks and non-financial intermediaries expressed over the countries' GDP. In this study, this variable is stipulated as M2/GDP. Data for this proxy is obtained from WDI 2021.

- Bank is used to estimate the viability and size of the banking system in relation to the countries' economies. Taken as a proportion of GDP, it is used to measure the domestic credit to the private sector by banks. It is

stipulated in this study as Bank/GDP. Data for this proxy is obtained from IFS 2021.

c. **Additional Controls**

iv.   **Investment in Physical Capital**: Investment in physical capital, which is also known as Gross Fixed Capital Formation, is a traditional source of GDP growth. As such, we have included it in this study as one of our control variables. It is stipulated as Investment/GDP. This variable is obtained from WDI 2021.

v.   **Government Debt**: This is a measure the entire stock direct fixed-term contractual obligations to others outstanding on a particular date. It encompasses the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government (World Bank, 2021). Our study hereby stipulates it as GOVDEBT expressed over the countries' GDP (GOVDEBT/GDP). It is obtained from the WDI 2021.

vi.   **Openness**: Openness commonly estimates the degree to which a country participates in the international system of trade. It is measured by the ratio between the volume of exports and imports and the GDP. As this is an indicator of comparative significance to the international trade in the economy of a country and has the propensity to affect the growth of economies, we have included it as a control variable. Data for this variable is obtained from WDI 2021.

vii.   **Inflation**: This is measured by the annual percentage change in the consumer price index. Inflation, which is commonly termed as "Rising Prices", has the proclivity to affect various facets of the economy and ultimately affects growth. As a matter of common sense, as prices rise, the cost of living, the cost of doing business, the cost of borrowing money, amongst others will also be greatly

impacted. As these are things that affect the growth of the economy, it makes sense to include inflation as a control variable in our study of the remittance-advancement of the financial sector-growth connexion. It is obtained from IFS 2021.

viii. **Population**: Very infrequently is this variable included in the remittance-financial development-growth analysis. In fact, we have seen that the number of remittance-financial development-growth scholarships that have included this variable is scarce. We believe that this is an essential control variable that affects the growth of economies and should be included in the analysis. It may be hard to determine whether population growth translates to economic growth, but think about this: When we study economics, we learn that labor is a factor of production. We also learn that the labor force is subservient to population growth. That means that the labor force increases with the growth of the population and decreases with population decline. It may be possible that as the labor force increases due to growing population, aggregate output will correspondingly increase in the long run, causing the GDP to also increase. The same could be true vice-versa. Based on this theory, we think it is essential to control for any effect population may have on the growth of the economies in our analysis. Hence, the log difference of population is included as a control variable. It is obtained from WDI 2021.

ix. **Investment in Human Capital**: Human capital investment is also a traditional source of growth. Therefore, we have included it as one of our control variables in this study. Secondary enrollment is used as a proxy for this variable, and it is obtained from UIS 2021.

3.4 Estimation of Empirical Models

3.4.1 Specification of model for Remittance-Growth relationship

Our primary objective is to explore the relationship between migrant remittances and the growth of economies. Predicated upon the premise in Section 3.2 and the model of equation (3.2), which was drawn from the augmented growth model, our model used for the empirical estimation of this objective is specified as follows:

$$\text{GDP Growth}_{i,t} = \beta_0 + \beta_1 \text{GDP Growth}_{i,t-1} + \beta_2 \text{Rem}_{i,t} + \beta_3 X'_{it} + \varepsilon_t$$

$$\varepsilon_t = \mu_i + v_i \text{ and } \gamma < 1$$

$$(3.3)$$

Where the initial level of GDP growth rate is denoted by $\text{GDP Growth}_{i,t}$, our variable of interest here is indicated by REM, indicating log of remittances of each country in our sample. Time is represented by t, i denotes countries, X'_t represents a vector of control variables which were described in the preceding section, the country effect and the idiosyncratic error term is represented by μ_i and v_i respectively. Our interest here is to estimate effect of migrant remittances on the growth of economies, which will be measured by testing the statistical significance of β_2.

3.4.2 Specification of model for Remittance-financial development-Growth relationship

Evidence suggests that the growth of economies can be influenced by remittances via numerous channels, one of which is the financial sector. Hence, our next objective is to examine the effect of migrants' remittances on the growth of economies through the financial sector. We particularly focus on how the growth of economies is affected by remittances through different

levels of financial development. Our hypothesis we seek to test here is whether the impact of migrants' remittances on the growth of economies is in anyway affected by the level of financial sector advancement and/or depth in countries receiving remittances. To examine the significance of remittances on the growth of economies at different levels of financial sector advancement, we interact the remittance variable with the proxies used in our study to represent the financial sector. We then estimate this effect by testing the statistical significance of the interaction term, β_4 in equation (3.4). In this case, if the coefficient of the interaction term is positively significant, it would support the complementarity hypothesis, whereby migrants' remittances affect the growth of economies more so if the financial sector is advanced and deep. Contrariwise, if the coefficient of the interaction term is negatively significant, it would support the substitutability hypothesis, whereby migrants' remittances more so affect the growth of economies in countries with less advanced and shallow financial sector. The model used for the empirical estimation of this objective is specified as follows:

$$\text{Growth}_{i,t} = \beta_0 + \beta_1 \text{Growth}_{i,t-1} + \beta_2 \text{Rem}_{i,t} + \beta_3 \text{FINDEV}_{i,t} + \beta_4 (\text{Rem}_{i,t} \text{ x FINDEV}_{i,t}) + \beta_5 X'_{it}$$

$$+ \, \varepsilon_t$$

$$\varepsilon_t = \mu_{it} + \nu_{it} \text{ and } \gamma < 1$$

$$(3.4)$$

Where the initial level of GDP per capita is denoted by $\text{GDP}_{i,t}$. Our variables of interest here are respectively indicated by REM and FINDEV, indicating log of remittances of each country in our sample and log of each proxy representing the financial sector variable, $\text{Rem}_{i,t}$ x $\text{FINDEV}_{i,t}$ represents the interaction between the remittance variable and each proxy representing the financial sector variable. Time is represented by t, i denotes countries, X'_t represents a vector of control variables which were described in the preceding section, the

country effect and the idiosyncratic error term is represented by μ_i and v_i respectively. Our interest here is to estimate the effect of migrant remittances on the growth of economies by considering different levels of the advancement of the financial sector. This is measured by testing the statistical significance of the interaction term β_4 in the equation.

3.5 Empirical Methodologies and Justifications for their use

3.5.1 Ordinary Least Squares and Linear Fixed Effect

Predicated upon meeting a set of assumptions, the Gauss-Markov theorem suggests that the OLS is the best unbiased coefficients' estimator. Hence, we commence our analysis by simply attempting to estimate the effect of migrants' remittances on the growth of the economies in our sample. While the results from this exercise are reported in this study based on equations (3.3) and (3.4), we would be remiss not to mention that the assumption of exogeneity was ignored. Seeking to apply the 'power-law' memory effect, we included the lagged GDP growth in our model. Given this inclusion, at the very least, the specified models contravene the exogeneity assumption of the OLS method as our independent variable is subject to explanations by its own historical value. This triggers correlation with the error term, thereby rendering the OLS estimates unreliable and biased at best. Moreover, we are further cognizant of any potential causality, reverse and otherwise between our two variables of interest as this is a traditional problem for many researchers covering this subject matter.

To help us resolve the issue of endogeneity, we first turn our attention to the use of the Linear Fixed effects method, which is widely considered the standard panel data technique. The Linear fixed effects model is contingent on within-group action and as such, frequent observations for each group as well as a judicious measure of variation of the independent variables of interest within each group are required. Given that our dataset is time-varying with several observations over a reasonable period, we think the Linear Fixed effects method is essential in obtaining

unbiased and consistent estimates. Additionally, the Linear Fixed effects model assumes that time-varying covariates are uncorrelated with the time-varying error term. As this is a much weaker assumption relative to the assumption of exogeneity required by pooled OLS, we decided to use the Fixed Effects method in our estimation to address problems of potential bias.

We first consider this fixed effect panel regression model similar to the estimation model of equation (3.3).

$$Y_{i,t} = \beta_0 + \beta_1 X'_{it} + \beta_2 Z_i + \mu_{it}$$

(3.7)

Where the unobserved time-invariant heterogeneities across entities $i = 1,...n$, is represented by Z_i. The objective here is to estimate the effect of β_1 which signifies the effect on the dependent variable given a change in X'_i, while holding Z_i constant. Now, supposing $\alpha_i + \beta_2 Z_i$, we attain:

$$Y_{i,t} = \alpha_i + \beta_1 X'_{it} + \mu_{it}$$

(3.8)

Now we have obtained individual specific intercepts $\alpha_i, i = 1,...n$ with each representing entity i's fixed effect. Change in $\alpha_i, i = 1,...n$, is sourced from Z_i. Hence, equation (3.8) can take a form containing $n - 1$ dummy regressors and a constant:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \gamma_2 D2_i + \gamma_2 D3_i + \cdots + \gamma_\eta D_{\eta i} + \mu_{it}$$

(3.9)

The above model shows n various intercepts with each entity having one intercept. Both equations (3.8) and (3.9) represent fixed effects model. However, we can still generalize the

model to contain more than just one determinant of Y that is correlated with X and that changes over time. They are as follow:

$$Y_{it} = \beta_1 X_{it} + \cdots + \beta_k X_{k,it} + \cdots + \alpha_i + \mu_{it}$$

(3.10)

Where the entity-specific effects that capture heterogeneities across entities is denoted by α_i, with , $i = 1,\ldots n$ and $t = 1,\ldots T$.

The above equation can also be equivalently formed as:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \cdots + \beta_k X_{k,it} + \gamma_2 D2_i + \gamma_2 D3_i + \cdots + \gamma_\eta D_{\eta i} + \mu_{it}$$

(3.11)

Where dummy variables are given as $D2_i$, $D3_i$, $\ldots D_{\eta i}$.

If we take the averages of both sides of equation (3.8), we will attain:

$$\frac{1}{n}\sum_{i-1}^{n} Y_{it} = \beta_1 \frac{1}{n}\sum_{i-1}^{n} X_{it} + \frac{1}{n}\sum_{i-1}^{n} \alpha_i + \frac{1}{n}\sum_{i-1}^{n} \mu_{it}$$

$$Y_{it} = \beta_1 \overline{X}_i + \alpha_i + \mu_{it}.$$

Subtraction from equation (3.8) then gives us

$$Y_{it} - \overline{Y}_i = \beta_1 (X_{it} - \overline{X}_i) + (\mu_{it} - \overline{\mu}_i)$$

$$\widetilde{Y}_{it} = \beta_1 \widetilde{X}_{it} + \widetilde{\mu}_{it.}$$

(3.12)

As indicated in equation (3.12), we show that OLS estimate of the parameter of interest β_1 can also be equal to the estimate of the same obtained using equation (3.9) without necessarily

having to estimate $n - 1$ dummies and an intercept. While both ways can yield the same results, our study employed the former as opposed to the latter.

With the use of fixed effects (group dummies), we control for the average differences across the economies in our dataset and in any observable or unobservable predictors thereof. The fixed effects coefficients engross all the action across the group. The remnant which is of interest to us is the within-group action. By so doing, we assume that we at least diminish the risk of omitted variable bias.

Of course, one may ask, "why not employ the Instrumental Variable (IV) approach to resolve the issue of endogeneity and address potential bias"?

Unfortunately, it goes without saying that in a study such as ours, one can hardly be entirely certain that the issue of endogeneity has been resolved and that the estimates obtained are unbiased and consistent. We agree that these issues can be resolved with the application of the IV approach whereby valid instruments can be employed. And that is exactly why we renege on the use of the IV approach. It is because the approach can only be effective on the condition that valid instruments can be found. The condition for an instrument set as Z_i to qualify as valid is as follow:

1. Relevance $\text{corr}\ (Z_i, y_{it-1)}\ \neq 0$

2. Exogeneity $\text{corr}\ (Z_i, v_{it)}\ \ \ = 0$

$$(3.13)$$

As endogeneity is traditionally existential in the relationship between remittances, the advancement of the financial sector and the growth of economies, the IV approach would without a doubt prove useful in addressing this problem. For any independent variable X and its instrument θ, the below conditions must also be placated:

1. Relevance $\qquad$ corr $(Z_i, y_{it-1)} \neq 0$

2. Exogeneity $\qquad$ corr $(Z_i, v_{it)} \quad = 0$

$$(3.14)$$

Equations (3.13) and (3.14) have austere conditions, and due to the strict conditions of these equations, it is challenging to find valid instruments, especially for this subject matter. However, in cognizance of the robustness the application of the IV approach would lend to our results, we initially set out to use the migrant stock of each country as an instrument. Sadly, due to data unavailability for the migrant stock variable for several countries in our dataset, we abandoned this plan.

Alternatively, we could employ the method propositioned by Anderson and Hsaio (1982) whereby variables can be generated in our model as instruments. Their proposed method works such that it satisfies the conditions of relevance and exogeneity required in equations (3.13) and (3.14). They suggested the use of y_{it-2} or Δy_{it-2} as an instrument for Δy_{it-1}. The rationale here is, while y_{it-2} or Δy_{it-2} may be correlated with Δy_{it-1}, there is no correlation of the same with Δv_{it}. Lending credence to the suggestion in the preceding sentence, the same can be applied to the independent variable X. Thus, the strict conditions in equations (3.13) and (3.14) are met.

While we acknowledge the originality of this method and its usefulness thereof, we are not oblivious to the major criticism it has received. It has been disparaged for not considering the full structure of the panel and all the information it provides. Given this, we also refrain from using this method.

However, we do not abandon our desire and responsibility to address problems of endogeneity and obtain estimates as consistent and unbiased as possible. Therefore, to further and robustly

address this problem and assuage any concerns about endogeneity we have, we turn to the use of the system GMM approach introduced by Blundell and Bond (1998). This method is explained in the subsequent sub-heading.

3.5.2 system Generalized Method of Moments (SGMM)

The system GMM approach is basically a standard technique used in statistical model estimation. Working in such a way that the expectation approaches or is zero at the parameters' true value, the methodology employs moment conditions that are functions of the model parameters and the data. Under this method, a system of two equations is built. The first of which is a transformed form and the other in levels of the original equation. As a dynamic panel estimator, the system GMM controls for endogeneity of the lagged dependent variable where there is correlation between the explanatory variable and the error term, it controls for measurement errors, omitted variables bias as well as unobserved panel heterogeneity. Blundell and Bond (1998) proposition can achieve all of this primarily because further assumptions were made about the nature of the model in their analysis. They assumed uncorrelation to the individual specific effect of the independent variable's (y_{it}) deviations from its long-run average. The assumption is empirically depicted below:

$$E[(y_{i1} - \bar{y}_i), u_i] = 0 \text{ for } i = 1, \ldots, N.$$

(3.15)

A combination of equation (3.15) with the relaxed assumption of uncorrelation of the country-specific effects with the error term gives us the following:

$$E[\Delta y_{it-1,}(u_i + v_{it})] = 0$$

$$E[\Delta x_{it-1,}(u_i + v_{it})] = 0 \text{ , for } i = 1,2,\ldots, N \text{ and } t = 3, 4, 5, \ldots, T$$

(3.16)

These conditions allow the building of a system of two equations:

$$\Delta y_{it} = \gamma \Delta y_{it-1} + \Delta x'_{it} \beta + \Delta v_{it}$$

$$y_{it} = \gamma y_{it-1} + x'_{it} \beta + \mu_{it} + v_{it}$$

(3.17)

We use the system GMM approach for further robustness because it addresses the problem of endogeneity and in its presence thereof, can obtain estimates close to the parameter's true value. While the Instrumental Variable approach is also robust, it is conditioned on the presence of strong external instruments. The system GMM approach addresses the issue of weak external instrument by utilizing instruments generated by the model internally. It addresses invariance in other variables where present and make it possible for their estimates to be obtained.

However, one may ask, "why not the difference GMM proposed by Arellano and Bond (1991)? We acknowledge that the difference GMM approach outperforms the pooled OLS method in more ways than one. Granted, we are also conscious of its limitations when matched against the system GMM approach. It magnifies gaps in an unbalanced panel data since it works to correct endogeneity by transforming all regressors through differencing and subtracting the previous observation from the contemporaneous one. It is also criticized for being unable to obtain estimations for time-invariant variables since they get purged in differenced equations. Blundell and Bond (1998) further provide evidence of poor performance by the difference GMM approach in estimating persistent models.

Predicated upon the above premise, we think the system GMM works best for our data set and it helps us to meet our goal of obtaining estimates as consistent and unbiased as possible and closer to the parameters' true values. Yet, we do not ignore some obvious limitations of the system GMM approach. Given that its credence is primarily dependent on the cogency of the

underlying assumptions made by its proponents, we employ the suggested robustness tests, amongst which are the Arellano Bond (AB) test for autocorrelation as well as the Hansen J test for overidentifying restrictions and ascertaining the cogency of the instruments. Credence to the selection of instruments is given in the case of Failure to reject these null hypotheses.

The system GMM approach involves the use of a greater number of moments conditions. Nevertheless, Monte Carlo evidence suggests that when the T (time) is relatively short and there is persistence in the dependent variable, precision is enhanced and reduction in small sample bias is achieved. To make our dataset more fitted for the application of the system GMM approach, we sacrifice temporal dimension of 10 years and increase spatial dimension. We initially set out to study 32 countries for a period of 40 years collapsed into 8 periods. Nevertheless, to improve the efficiency of the system GMM approach based on the Monte Carlo's evidence cited above, we reduce the temporal dimension from 40 to 30 years, which we collapsed into 6 periods, taking a 5-year average of each variable. We then increase the spatial dimension from 32 countries to 64 countries.

3.6 Conclusion

Thus far, we entertained substantial discussion of the theoretical framework upon which our model is based. We further proposed the empirical models we use to measure remittances' impact on the growth of economies, migrant remittances and the advancement of the financial sector impact on the growth of economies, as well as remittances' impact on the growth of economies while considering levels of financial sector advancement. We describe the variables we use in this study, including but not limited to our explained variable, other variables of interest as well as supplementary control variables. We examined the weaknesses and strengths of other methods of estimation and indicated our reason for not employing them in our study.

The argument for the use of Fixed effects and system GMM approaches for empirical analysis was also made in this chapter.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, we present the results and provide discussion of them. Our discussion of the estimation results is predicated on the models we proposed in the preceding chapter. Our regression and analysis were done in STATA 16.

The sections in this chapter are arranged in the following way: Section 4.2 contains presentation of the descriptive statistics, and in Section 4.3, we present the estimation results.

4.2 Presentation of Descriptive Statistics

We observe data from a 30-year period ranging from 1990 to 2019. We collapsed our data using a 5-year average. The average GDP growth for the period under consideration in our sample is reported as 1.86%. The standard deviation of the collapsed data for the 6 periods is 2.32% with a maximum average of 10.16 and a minimum average of -7.93%. Both the lowest and highest GDP growth rates for the observed periods within the sample are recorded by countries in the sub-Saharan African region. The lowest GDP growth rate is -47.50% recorded in Rwanda in 1994. This is comprehensible since the country was plunged into a brutal tribal conflict during this period. However, the highest is 37.53%, which was also recorded in Rwanda in 1995. Sierra Leone followed Rwanda with a low growth rate of -22.31% recorded in 2015 and a high growth rate of 21.02% recorded in 2002.

The share of remittance in GDP is averaged at 3.41% with a standard deviation of 4%, an averaged maximum of 20.87%, and a minimum of 0% for the collapsed data of 5-year average. Amongst countries within the sample, the highest share of remittance in GDP is 24.40% recorded in Guyana in 2005. This is followed by 23.21% recorded in Haiti in 2019, and 21.87%

recorded in El Salvador in 2008. These averages are far greater than the world average of 4.19% in 2019 (World bank, 2019). There is no surprise here as these countries are traditionally high recipients of remittance. There are other countries and regions such as Tonga, Tajikistan, Kyrgyzstan, and Nepal, that report higher shares of remittance in GDP, but they are not included in this study due to data unavailability for other key and supplementary variables.

On the other hand, the lowest share of remittance in GDP amongst countries in the sample is 0% recorded by Mauritania for the period of 2005-2016, Gabon in 2006, Comoros in 2013, and Congo Republic in 2019 respectively.

The share of investment to GDP for the observed periods averaged 20.71% with a standard deviation of 8.18%, an averaged maximum of 49.31% and a minimum of 0% for the collapsed data of 5-year average. As evidenced by the huge standard deviation, it is safe to say investment across countries is far from equal as expected. For countries within the sample, Mauritania recorded the highest investment to GDP ratio of 93.54 in 1994, followed by Congo Republic recording 79.46 in 2016. The lowest is 0 recorded by Saint Lucia and Dominica.

Government debt-to GDP ratio over the observed periods is averaged at 55.45% with a standard deviation of 36.63%, an averaged maximum of 389.18%, and a minimum of 0% for the collapsed data of 5-year average. Some remarkable highs are 495.20%, 285.89%, and 386.47% recorded in 1992, 1993, and 1994 respectively. This is followed by Venezuela recording 232.79% in 2019. The lowest is 0% recorded by Congo Republic from 1990-1999, followed by 0.07% recorded by Senegal in 1996.

Log of Trade Openness averaged 4.71% with a standard deviation of 0.50%, an averaged maximum of 5.72% and a minimum of 2.66% for the collapsed data of 5-year average. Notable highs of Trade-GDP ratio before the collapsed mean were analyzed were recorded by Malta at 322.67 in 2012, Guyana at 274.97 in 1992, Seychelles at 225.02 in 2009, and Kenya at 217.57

in 1999 respectively. Malta reported a consecutive high for most periods. In the same vein, notable lows were by Brazil at 15.63 in 1996, and Guatemala at 15.50 in 1990 respectively.

Inflation measured by the annual percentage change in consumer price index averaged at 17.85% with a standard deviation of 120.56%, an averaged maximum of 1667.15% and a minimum of 0.296% for the collapsed data of 5-year average.

Log of population growth averaged 0.466% with a standard deviation of 0.691%, an averaged maximum of 1.54% and a minimum of -2.93 for the collapsed data of 5-year average. The highest amongst countries in the sample is 8.11% recorded by Rwanda in 1998. The lowest are -6.76% recorded by Rwanda in 1993, -2.62% recorded by Seychelles in 2011, and -1.23% recorded by Venezuela in 2019.

Log of human capital measured by secondary enrollment averaged at 3.95 with a standard deviation of 0.63, an averaged maximum of 4.87 and a minimum of 1.84 for the collapsed data of 5-year average. Consistent highs were recorded by Costa Rica from 2013-2014, Thailand from 2014-2019, and Peru from 2015-2019. The lowest rates were recorded by Mali in 1990, Ethiopia in 1994, and Côte d'Ivoire in 1999. Data for this variable was unavailable for all the countries in the sample.

Domestic credit supplied by the financial sector to GDP (Credit-GDP ratio) averaged at 32.90 with a standard deviation of 28.84, an averaged maximum of 161.66 and a minimum of 0 for the collapsed data of 5-year average. Consistent highs were recorded by Chile from 2013-2017, while fluctuated highs for the period were recorded by South Africa, Thailand, and Malaysia. The lowest ratios were recorded by Sudan in 1995, Sierra Leone in 1991, Congo Republic in 2006, and Malawi in 1997.

Proportion of domestic credit to the private sector to GDP (Private Credit-GDP ratio) has a mean of 32.47, a standard deviation of 32.47, a maximum of 141.31 and a minimum of 0 for

the collapsed data of 5-year average. Notable highs were recorded by South Africa, Malaysia, and Thailand, while notable lows were mostly recorded by countries in the sub-Saharan African region.

Money and Quasi money (M2/GDP) to GDP averaged 41.07 with a standard deviation of 27.43, an averaged maximum of 160.75, and a minimum of 0. Consistent highs were recorded by Malta, while fluctuated highs were recorded by Thailand and Malaysia. Notable lows were mostly recorded by countries in sub-Saharan Africa.

Domestic credit to the private sector by banks (Bank/GDP) to GDP has a mean of 35.61, a standard deviation of 25.88, a maximum of 141.78, and a minimum of 0. Consistent highs for this variable were recorded by Malta, while fluctuated highs were recorded by Thailand and Malaysia. Notable lows were mostly recorded by countries in sub-Saharan Africa.

Table 4.1: Synopsis of Statistics for all variables (1990-2019 at 5-year averages)

Variables	# of observations	Mean	Standard Deviation	Maximum	Minimum
GDP growth	383	1.86	2.32	10.16	-7.93
Rem/GDP	379	3.41	4.00	20.87	0
Investment/GDP	380	20.71	8.18	49.31	0
Government Debt	325	55.95	36.63	389.18	0
Log of Trade Openness	371	4.71	0.50	5.72	2.66
Inflation	369	17.85	120.56	1667.15	-0.296
Log of Population Growth	373	0.466	0.691	1.54	-2.93
Log of Human Capital	343	3.95	0.63	4.87	1.84

Domestic Credit supplied by the financial sector (Dcredit/GDP)	382	32.90	28.84	161.66	0
Proportion of domestic credit to the private sector (Pcredit/GDP)	382	32.47	32.47	148.31	0
Money and Quasi money (M2/GDP)	381	41.07	27.43	160.75	0
Domestic Credit to the private sector provided by banks (Bank/GDP)	382	35.61	25.88	141.78	0

Source: Author's calculations based on data sourced from the WDI database

4.3 Discussion of Estimation Results

In this section, we present our estimation results. We use tables to present and illustrate findings from our analysis and provide discussion of the same.

We first estimate the linear impact of migrants' remittances on the growth of economies without the inclusion of proxies of the advancement of the financial sector variable by using equation (3.3), the empirical results of which are adduced in Table 4.2. In our endeavor to estimate equation (3.3) as presented in Table 4.2, we employed 3 empirical techniques. The first column shows results from the use of the OLS estimator. However, issues of endogeneity are not addressed. Column (2) shows regression results from the use of the Fixed Effect (FE) estimator, while column (3) shows results from the system GMM estimator. As we have previously explained, there is concern about endogeneity in the exploration of the migrants' remittances-growth of economies connexion as well as the remittances-advancement of the

financial sector relationship. Hence, we do not focus on discussing the results of the OLS estimates because we anticipate potential bias.

In Column (2), the lagged GDP growth coefficient is shown to not only be negative as we expected in apriorism, but also strongly significant. Investment in physical capital, represented by gross capital formation is positively correlated with and is indicated to significantly affect the growth of the economies in our sample. Lending credence to our apriorism, government debt is also shown to be negatively correlated with and significantly affecting the growth of economies in our sample. The results obtained for these variables appear to substantiate the theory heralded by Fer and Henrekson (2001) that increased government involvement in the economy influences the growth of economies in a way that is far from inconsequential. Finally, the coefficient of the inflation variable indicates that the high rate of inflation across economies in our sample is strongly linked to lesser rate of growth amongst them. Thus, this satisfies the traditional relationship between inflation and the growth of economies. Moreover, we note that Rem/GDP, which is our variable of interest in column (2) is not statistically different from zero, which signifies that it is not significant at any of the conventional levels and does not appear to have a significant impact on the growth of economies.

We then proceed to use the system GMM approach to estimate the same relationship in linearity where we supposed that the issues of endogeneity are addressed. The results are illustrated in column (3). Lagged GDP growth and human capital variables lose their significance under this method, while population maintains no significance as it was under the previous two methods. Investment remains positively correlated with and exacts a significant impact on the growth of economies, while government debt, trade openness, and inflation remain negatively correlated and strongly significant with the growth of economies in our sample.

However, contrary to the Rem/GDP estimates obtained under the previous techniques, the Rem/GDP coefficient estimate under the System GMM technique gains statistical significance at 10%. Yet, its impact on the growth of economies while positive and indicated by a coefficient estimate of 0.021, which suggests that a percentage increase in remittance inflow is expected to translate to a 0.021% increase in the growth of economies seems to be minuscular at best. Thus, substantiating the findings from previous studies which imply that the linear impact of migrants' remittance on the growth of economies is not strongly significant, albeit positive. Using the system GMM approach to circumvent and/or address issues of potential bias, we conducted and hereby present the AB (2) test for Autocorrelation and the Hansen test for overidentifying restrictions for further robustness. The results indicate that both external and internal instruments under this method are valid. It is important to note here that out of curiosity during our analysis, we observe that by omitting one of the conduits through which the growth of economies is likely to be affected by remittances, the Rem/GDP appear to have a relatively lesser impact on the dependent variable. Succinctly, this implies that while remittances can influence the performance of growth across economies, its impact can further be enhanced through the interaction with and/or inclusion of other variables. Our first objective to establish a connexion between migrants' remittances and the growth of economies and to explore the impact thereof is thus accomplished by the estimation of equation (3.3) and presentation and discussion of the results in Table 4.2 below.

Table 4.2 Regression showing remittances' impact on growth in linearity (Without Financial Development Variables)

DEPENDENT VARIABLE:	GROWTH OF REAL GDP PER CAPITA		
	(1) OLS	(2) Fixed Effects	(3) SGMM
LAGGED GDP GROWTH	-0.627***	-5.934***	-1.068
	(0.263)	(1.000)	(1.043)
REM/GDP	0.054	0.033	0.024*
	(0.062)	(0.095)	(0.016)
INVESTMENT/GDP	4.698***	5.232***	5.039***
	(0.571)	(0.795)	(1.138)
GOVERNMENT DEBT	-0.173**	-0.023***	-0.152*
	(0.076)	(0.005)	(0.098)
TRADE OPENNESS	-0.401	1.211*	-1.204**
	(0.320)	(0.693)	(0.623)
INFLATION	-0.024**	-0.008	-0.048**
	(0.011)	(0.010)	(0.019)
POPULATION GROWTH	0.312	-0.111	0.063
	(0.421)	(0.824)	(0.572)
HUMAN CAPITAL	0.697**	-0.669	1.314
	(0.386)	(0.903)	(1.643)
CONSTANT	-5.011**	34.613***	0.046
	(2.537)	(8.910)	(8.42)
OBSERVATIONS	384	384	382
# OF COUNTRIES			64
AR (1) TEST P-VALUE			0.00
AR (2) TEST P-VALUE			0.54
HANSEN J-STATISTIC			0.57

NOTE: WE REPORT ROBUST STANDARD ERRORS IN PARENTHESIS, AND THEY ARE * SIGNIFICANT AT 10%; ** SIGNIFICANT AT 5%; *** SIGNIFICANT AT 1% RESPECTIVELY. ALL VARIABLES HAVE BEEN LOGGED, EXCEPT INFLATION AND REM/GDP.

Source: Author's Calculation

Having established that the remittance variable has the capacity to influence growth performance through its interaction with or in the presence of other variables, we set out to explore its interaction with other conduits by answering the question of whether the distinctive mode of expenditure of migrants' remittances and its capacity thereof to affect the growth of economies is predisposed by the advancement of the financial sector in the receiving countries. To this end, we explore the effect of remittances on the growth of economies while considering different levels of financial development.

We begin by estimating equation (3.4) in which we include a set of proxies of the advancement of the financial sector variable, with which we create interaction terms with the remittance variable. Using OLS and system GMM empirical techniques, we estimate equation (3.4), and we present the results in Table 4.3 and 4.4 respectively. More intuition about the nature of remittances can be drawn from the sign of the coefficient of each interaction term. Indeed, if

the sign of the interaction terms is negative, then we can lend credence to the substitutability hypothesis and we can then infer that migrants' remittances and the advancement of the financial sector work as substitutes in advancing the growth of economies. On the other hand, if the sign of the interaction term is positive, we can support the complementarity hypothesis and conclude that a country with a well-functioning financial system will enhance remittances' effect on the growth of its economy.

We first present the OLS regression estimates in Table 4.3. Lagged GDP growth, investment, inflation, and government debt maintain significance in their effect on growth in the presence of remittance inflows and with the inclusion of the financial development proxies. Trade openness gains significance with the inclusion of Bank/GDP. The Rem/GDP coefficient is reported at 0.24 with the inclusion of dcred, 0.22 with the inclusion of pcred, 0.188 with the inclusion of M2, and 0.20 with the inclusion of Bank/GDP. These represent a 355%, 316%, 248%, and 277% respective increase from the previous linear regression coefficient estimate of the Rem/GDP variable obtained under the OLS technique in Table 4.2 without the financial development proxies.

Table 4.3 OLS Estimates for Migrant Remittances, Advancement of Financial Sector, and the growth of economies

	DEPENDENT VARIABLE:		GROWTH OF REAL GDP PER CAPITA	
	(1) Dcred/GDP	**(2) Pcred/GDP**	**(3) M2/GDP**	**(4) Bank/GDP**
LAGGED GDP GROWTH	-0.673**	-0.654***	-0.652***	-0.692***
	(0.261)	(0.258)	(0.245)	(0.248)
REM/GDP	0.246**	0.225*	0.188**	0.204*
	(0.104)	(0.117)	(0.101)	(0.114)
INVESTMENT/GDP	4.013***	4.101***	4.250***	3.982***
	(0.624)	(0.632)	(0.512)	(0.602)
GOVERNMENT DEBT	-0.127***	-0.117**	-0.131**	-0.089*
	(0.050)	(0.052)	(0.054)	(0.057)
TRADE OPENNESS	-0.382	-0.366	-0.406	-0.472*
	(0.316)	(0.341)	(0.350)	(0.331)
INFLATION	-0.017**	-0.018**	-0.024*	-0.019**
	(0.009)	(0.009)	(0.013)	(0.010)
POPULATION GROWTH	0.341	0.273	0.251	0.304
	(0.403)	(0.414)	(0.421)	(0.443)
HUMAN CAPITAL	0.501	0.516	0.655*	0.643*
	(0.364)	(0.372)	(0.377)	(0.367)
DCRED/GDP	0.041***			
	(0.015)			
*REM/GDP*DCRED/GDP*	-0.008**			
	(0.004)			
PCRED/GDP		0.022**		
		(0.003)		
*REM/GDP*PCRED/GDP*		-0.008***		
		(0.003)		
M2/GDP			0.024***	
			(0.008)	
*REM/GDP*M2/GDP*			-0.004**	
			(0.002)	
BANK/GDP				0.009
				(0.010)
*REM/GDP*BANK/GDP*				-0.003*
				(0.002)
CONSTANT	4.310	4.723*	4.903**	3.156*
	(2.805)	(2.613)	(2.504)	(2.417)
OBSERVATIONS	371	372	376	383
R-SQUARE (ADJ.)	0.34	0.32	0.31	0.32

NOTE: WE REPORT ROBUST STANDARD ERRORS IN PARENTHESIS, AND THEY ARE * SIGNIFICANT AT 10%; ** SIGNIFICANT AT 5%; *** SIGNIFICANT AT 1% RESPECTIVELY. ALL VARIABLES HAVE BEEN LOGGED, EXCEPT INFLATION AND REM/GDP.

Source: Author's Calculation

Given the presence of potential bias in the estimation by use of OLS, we concentrate our discussion on the estimates obtained from the system GMM approach in Table 4.4 below, where we believe we control for any anticipated bias. But we would be remiss not to mention that results from the two techniques appear to be similar in quality and quantity.

For our system GMM regressions with the inclusion of financial development proxies, we used lags of all endogenous variables as instruments, and we conducted AB (2) test for autocorrelation as well as the Hansen test for overidentifying restrictions to test the cogency of

our instruments. The cogency of the moment conditions presumed for the estimation fails to be rejected as indicated by the AB (2) test for autocorrelation and the Hansen test for overidentifying restrictions.

The results show that the supplementary control variables such as lagged GDP growth, investment, and inflation are highly significant under all proxies of financial development. Trade openness is significant under all except pcred/GDP, human capital is significant under pcred/GDP and Bank/GDP while population growth is insignificant under all proxies.

The results primarily adduce convincing substantiation of a positive and significant coefficient of the remittance variable as well as a positive coefficient of the interaction terms. This indicates that the marginal effect of remittances on growth increases with the level of efficiency, viability, and depth of the financial sector.

Four proxies are used to represent the size and depth as well as the viability and efficiency of the financial sector. M2/GDP and Bank/GDP are used as measurement of the size and depth of the financial sector, while Dcred/GDP and Pcred/GDP are used to denote, measure, and illustrate the efficiency and viability of the financial sector. The coefficient estimate of the interaction term of the remittance variable with the variable representing domestic credit supplied by the financial sector to the GDP (dcred/GDP) is 0.009 and it is significant at 1%, with the variable representing the proportion of domestic credit to the private sector (pcred/GDP), it is 0.010 and strongly significant at 1%, with the variable representing money and quasi-money (M2/GDP), it is 0.007 significant at 5%, and with the variable representing domestic credit to the private sector provided by banks (Bank/GDP), it is 0.007 significant at 1%. These results appear to lend credence to and support the complementarity hypothesis promulgated by two previous studies conducted by Mundaca (2009) and Bettin and Zazzaro (2012), whereby migrant remittances and the advancement of the financial sector support each

other. The understanding here is that remittance tends to enhance the growth of economies through the advancement of the financial sector. Intuitively, we can allude to Terry and Wilson (2005), where we can imagine an active cycle here, and also reason that countries with an advanced and efficient as well as a deep and vibrant financial system will encourage migrants to remit more money to their home countries. With a significant volume of remittances going through the financial system, we can expect that competition amongst financial institutions will be fostered, a culture of financial inclusion and/or democracy will be established, and a relatively plodding process of institutionalization in the financial space will be initiated. As this ensue in a given country, the growth of the economy is neither far behind nor is it forgotten. It is expected that the huge chunk of remittance that goes through the financial sector will stimulate competition. Competition amongst existing and emerging financial institutions in a country as a result of remittance inflows will enormously impact the general welfare of the citizens and will ultimately impact the growth of the economy. This is accomplished in such a way that the competition may occasion better access to financial services offered by financial institutions, facilitate decrease in the cost of doing business, as well as certify the availability of credit lines and facilities to consumers and small businesses. Productivity and competitiveness in the business sphere will be bolstered and dynamic markets will be promoted ultimately promoting growth of the economy. Hence, we can say that an economy tends to be more impacted by remittance inflows with the depth, size, viability, and efficiency of the financial system.

Table 4.4 SGMM Estimates for Migrant Remittances, Advancement of the Financial Sector, and the growth of economies

DEPENDENT VARIABLE:	GROWTH OF REAL GDP PER CAPITA			
	(1) Dcred/GDP	(2) Pcred/GDP	(3) M2/GDP	(4) Bank/GDP
LAGGED GDP GROWTH	-1.382*	-2.351***	-1.470*	-1.856**
	(0.763)	(0.856)	(0.767)	(0.831)
REM/GDP	0.410**	0.374**	0.263*	0.324**
	(0.182)	(0.157)	(0.137)	(0.161)
INVESTMENT/GDP	3.120***	2.654**	4.062***	3.612***
	(0.982)	(1.310)	(1.303)	(1.170)
GOVERNMENT DEBT	-0.298**	-0.277*	-0.294*	-0.286*
	(0.182)	(0.163)	(0.169)	(0.159)
TRADE OPENNESS	-1.310*	-1.202	-1.071*	-1.480*
	(0.718)	(0.927)	(0.621)	(0.781)
INFLATION	-0.027**	-0.023**	-0.037**	-0.025**
	(0.014)	(0.012)	(0.014)	(0.015)
POPULATION GROWTH	0.106	-0.133	-0.068	0.210
	(0.601)	(0.613)	(0.608)	(0.570)
HUMAN CAPITAL	1.302	2.534**	1.185	2.402*
	(1.140)	(1.230)	(1.247)	(1.324)
DCRED/GDP	0.065***			
	(0.021)			
REM/GDP*DCRED/GDP	0.009***			
	(0.003)			
PCRED/GDP		0.078***		
		(0.024)		
REM/GDP*PCRED/GDP		0.010**		
		(0.005)		
M2/GDP			0.052***	
			(0.017)	
REM/GDP*M2/GDP			0.007***	
			(0.003)	
BANK/GDP				0.033***
				(0.014)
REM/GDP*BANK/GDP				0.007***
				(0.003)
CONSTANT	8.073	15.660**	4.913	9.522
	(6.329)	(7.902)	(7.246)	(7.615)
OBSERVATIONS	384	384	376	382
# OF COUNTRIES	64	64	63	63
R-SQUARE (ADJ.)	0.24	0.11	0.20	0.22
AR (1) TEST P-VALUE	0.00	0.00	0.00	0.00
AR (2) TEST P-VALUE	1.00	0.79	0.75	0.90
HANSEN J-STATISTIC	0.86	0.77	0.57	0.72

NOTE: WE REPORT ROBUST STANDARD ERRORS IN PARENTHESIS, AND THEY ARE * SIGNIFICANT AT 10%; ** SIGNIFICANT AT 5%; *** SIGNIFICANT AT 1% RESPECTIVELY. ALL VARIABLES HAVE BEEN LOGGED, EXCEPT INFLATION AND REM/GDP.

Source: Author's Calculation

Indeed, our findings in this section indicates the following:

(1) That migrants' remittances have a positive impact on the growth of economies even without the consideration of the advancement of the financial sector. This was indicated in the results obtained in Table 4.2 using three techniques of empirical estimations.

(2) That migrants' remittances positively impacts the growth of economies through the financial development channel as evidenced by the results obtained in Table 4.3 (OLS) and Table 4.4 (SGMM)

(3) That the advancement of the financial sector and migrants' remittances can complement each other in stimulating growth in economies. This was also substantiated by the results presented in Tables 4.3 (OLS) and 4.4 (SGMM).

CHAPTER FIVE

CONCLUSION AND POLICY RECOMMENDATION

5.1 Conclusion

We commissioned this study to examine the relationship between migrants' remittances and the growth of economies and the impact of migrants' remittances while considering the conduit of financial development across different levels of 64 countries over a period of 30 years (1990-2019). We initially obtained estimates using the OLS and Fixed effects method. Albeit appearing diminutive, minuscular and probably inconsequential in impact, we found a positive relationship between migrants' remittances and the growth of the economy, indicating that the growth of the economies is bolstered with the inflow of remittances. However, we acknowledge the immense likelihood of endogeneity associated with the relationship between these variables, and that the use of OLS without controlling for such bias may produce inconsistent and unbiased estimates.

Seeking to address the issue of endogeneity and to obtain estimates as consistent and unbiased as possible, we turned to the use of the system GMM method whereby instruments generated internally are employed to control for endogeneity. Thus, we suppose that we obtained estimates close to the parameter's true value. The features of this technique as postulated by Blundell and Bond (1998) make it best suited for our model and dataset.

The results obtained in linearity using the system GMM method without the inclusion of the financial development proxies indicate that migrants' remittances positively and significantly foster growth in economies, notwithstanding diminutive in its impact. This finding and conclusion support the work of several other researchers such as Mundaca (2009), Muhammed et.al, (2011), Jayaraman et. al (2011), Oshota and Badejo (2015), and Shera and Meyer (2013),

all of whom employed various empirical techniques and postulated that migrants' remittances exert a significantly positive impact on the growth of economies.

We also acknowledge the postulation of Mundaca (2009), Nyamongo et. al, (2012), and Chowdhurry (2016) that the remittance and growth of economies relationship is not entirely linear and that the impact of remittance on growth marginally increases in the presence of or with the interaction of other conduits, particularly financial development. To this end, we embarked on ascertaining the relationship between migrants' remittances and the growth of economies as well as the marginal impact of the former on the latter while considering the advancement of the financial sector. We used four adequate proxies to capture the size, depth, viability, and efficiency of the financial sector and sought to estimate remittances' impact on the growth of economies by considering the advancement of the financial sector. Our results also informed us about the interplay between remittances and the advancement of the financial sector.

Following the pattern we established with other estimations, we began this feat by estimating using the OLS method. The results are reported in chapter 4. However, concerned about the endogeneity associated with those variables and the potential bias and likelihood of obtaining biased and less than consistent estimates, we employed the use of the system GMM method. We suppose that the system GMM method addresses this issue in our estimations.

Indeed, the results show that the marginal impact of remittance on the growth of economies greatly increased with the inclusion of the proxies for the advancement of the financial sector. With the inclusion of each proxy, the coefficient of the remittance variable remained positive and statistically significant. This indicates that the effect of remittance on the growth of economies increases in the presence of other conduits or traditional influencers of growth. Moreover, and quite interestingly, our results also show positive and statistically significant

coefficients for the interaction terms. To ascertain remittances' impact on the growth of economies given the size, depth, viability, and efficiency of the financial sector, we created interaction for remittance and each proxy representing the financial sector either in quality or quantity. The result for each interaction term is positive and statistically significant at conventional levels. This finding agrees with the postulation proffered by some researchers such as Mundaca (2009), Bettin and Zazaro (2012), and Sibindi (2014), all of whom applied various econometric technique and concluded that migrants' remittances and the advancement of the financial sector complement each other in fostering the growth of economies. The understanding is that countries with bigger, deeper, and a more viable and efficient financial sector tend to get the most benefit out of remittances. The inflows of remittance are likely to increase given the size, depth, viability, and efficiency of the financial sector of a country, and such increase will ignite competition amongst institutions, increasing efficiency, productivity, access to credit by consumers and small business, as well as the creation of productive channels for investment. It is expected that his will ultimately impact the growth of the economy. On the other hand, inflows of remittance are also likely to improve the development of the financial sector. As the volume of remittance increases, so will the necessity for a much deeper, larger, viable, and efficient financial system to accommodate such increase. Lending credence to Schumpeter (1934) and King and Levine (1993), this enhancement of the financial sector is likely to affect the growth of economies because productive capacity can be enhanced with a well-functioning financial system.

Thus, we conclude that not only does remittance have a positive effect on the growth of economies, but its marginal effect on growth also increases with the size, depth, viability, and efficiency of the financial sector. In the same vein, the inflows of migrants' remittances have the propensity to expand and further develop the financial sector of an economy through

primarily competition amongst financial institutions. Moreover, remittance and the advancement of the financial sector complement each other in the growth of economies.

5.2 Policy Recommendation

We do not attempt to insinuate that remittance impact on the growth of economies is any greater than the impact of traditional growth influencers on enhancing economic growth. If anything, our study has shown that remittance exerts greater impact on growth when interplayed with other growth-enhancing variables than it does when treated as a lone variable. An understanding of the channel via which the growth of economies is affected by migrants' remittances is imperative for devising policy that will augment remittance's impact.

However, alluding to our findings in this research, it goes without saying that policy actions regarding remittances and the advancement of the financial sector can expedite growth in economies. The World Bank acknowledges the resilient inflow of remittances in 2020 even during a global health crisis. Officially recorded volume of migrants' remittance inflows in 2020 was $540 billion (World Bank, 2021). The volume of remittances, especially to developing countries are expected to increase as globalization and migration are promoted.

Our initial finding suggests that remittance has both a positive relationship with and impact on the growth of economies. This result should embolden governments and policy makers to boost the inflows of remittance and ensure its continuity. To facilitate this, countries, especially those whose GDPs are accounted for by a large proportion of remittance should encourage short-term migration, say for a period between one and ten years. In chapter 2 of this research where we outlined a sender's motivations to remit, we indicated that an immigrant who intends to return home from the host country after a short time, is most likely to remit funds. Hence, we expect that encouraging short term migration will definitely enhance remittance inflows.

While countries whose GDPs are accounted for by a large proportion of remittance should seek to maximize remittance inflows, said countries should also pursue the continuity of the inflows. This can be achieved by discouraging long-term migration. A person who decides to settle in a host country long term is less likely to remit in comparison to a person who intends to stay shortly. Long term migration may reduce the volume of remittance sent to a given country, decrease investments driven by remittance inflows, negatively affect the domestic labor market, and ultimately affect growth.

Besides boosting the inflows of remittance and ensuring its continuity, countries should also seek to create a sound financial environment. Our findings support the postulation that financial development complements remittance in enhancing the growth of economies. This means that the magnitude at which the growth of economies is affected by remittance is greater in the presence of an advanced financial sector. Hence, government should seek to create a sound, efficient, reliable, and viable financial sector in order to maximize and sustain remittance inflows.

Appendix I: Remittance trends from 1990 to 2019 showing that remittance to Low and Middle-income countries except for China are greater than FDI (World Migration Report, 2020)

Source: Estimates of the World Bank staff, WDI, IMF
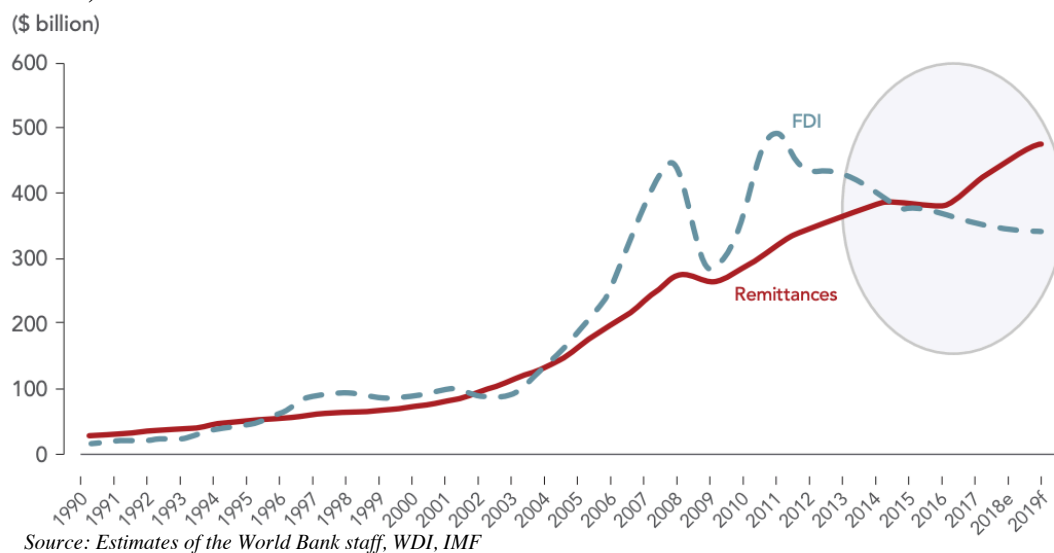
Appendix II: Simple correlation matrix of all variables

	GDP Growth	Rem/GDP	Inv/GDP	Gov't Debt	Trade Openness	Inflation	Pop Growth	Human Capital	Dcred/GDP	Pcred/GDP	M2/GDP	Bank/GDP
GDP Growth	1.00											
Rem/GDP	0.14	1.00										
Investment/GDP	0.41	0.17	1.00									
Gov't Debt	-0.12	-0.17	-0.09	1.00								
Trade Openness	0.15	0.27	0.39	0.11	1.00							
Inflation	-0.26	-0.16	-0.04	0.00	-0.28	1.00						
Pop Growth	0.10	0.14	-0.11	0.06	-0.19	-0.22	1.00					
Human Capital	0.06	0.04	0.34	-0.14	0.32	-0.22	-0.48	1.00				
Dcred/GDP	0.18	0.07	0.38	-0.06	0.33	-0.10	-0.23	0.41	1.00			
Pcred/GDP	0.05	0.06	0.28	-0.17	0.22	0.06	-0.15	0.35	0.69	1.00		
M2/GDP	0.23	0.27	0.40	-0.09	0.42	-0.25	-0.19	0.37	0.76	0.64	1.00	
Bank/GDP	0.21	0.22	0.39	-0.08	0.41	-0.18	-0.27	0.47	0.83	0.67	0.95	1.00

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