REPUBLIQUE DU CAMEROUN

Paix – Travail – Patrie

****

UNIVERSITE DE DSCHANG

****

ECOLE DOCTORALE

****

REPUBLIC OF CAMEROON

Peace – Work – Fatherland

****

UNIVERSITY OF DSCHANG

****

POST GRADUATE SCHOOL

****

DSCHANG SCHOOL OF ECONOMICS AND MANAGEMENT

Laboratoire d'Analyse et de Recherche en Economie Fondamentale et Appliquée (LAREFA)

PhD thesis

THREE ESSAYS ON THE EFFECTS OF CAPITAL FLOWS ON ECONOMIC CYCLES IN THE CEMAC ZONE

Thesis submitted to the Dschang School of Economics and Management for the Doctorat/Ph.D en Sciences Economiques degree.

Written by:

NENGHEM TAKAM Hervé
Master of Science in Economics
Matricule: CM-UDS-19SEG1229
Option: Mathematical Economics

Under the direction of:

Prof. TSAFACK NANFOSSO Roger
Professor, University of Dschang

DISCLAIMER

The University of Dschang does not intend to give any approval or disapproval to the opinions expressed in this thesis. They are to be considered as the author's own.

CONTENTS

DEDICATION

To

TAKAM Joseph & NGATSING Delphine wife TAKAM

DEFFO Christophe & YOMBIA Elise Véronique wife DEFFO

NENGHEM Josephine

ACKNOWLEDGEMENTS

First of all, I give thanks to GOD Almighty, the master of time and circumstance, without whom this work would not have seen the light of day. I would also like to thank all those who, in one way or another, have contributed to our training and to the realization of this research work. In particular, I would like to thank

To Professor TSAFACK NANFOSSO Roger, supervisor of this thesis, who despite his multiple occupations, agreed to sacrifice his precious time to supervise this thesis. His availability at all times and in all places, his rigorous approach to his work, his critical spirit and his many constructive remarks, observations and suggestions were invaluable to me in completing this work. I am eternally grateful to him.

To Professors AVOM Désiré and DAMA DIE Marcel, for agreeing to chair this thesis jury. I would also like to thank the various members of the jury for the attention they have paid to my work by doing me the honour of being an examiner for this thesis.

To Professor NGOUHOUO Ibrahim, Senior Lecturer at the University of Dschang, who, through his many comments and suggestions, never tired of encouraging me throughout the writing of this thesis. May he find in this thesis the expression of my gratitude.

To the administrative staff of the Consortium for Economic Research in Africa (CREA), who kindly granted me funding to write this thesis. May they receive in this thesis the expression of my deep gratitude.

To Doctor TOTOUOM Armand, lecturer at the Faculty of Economics and Management of the University of Dschang, for his advice, guidance and proofreading of this thesis. Please find in this thesis, dear Doctor, the expression of my gratitude.

To Doctors NGOMSI Augustin and MBOUTCHOUANG Armand, teaching respectively at the Faculty of Economics and Management of the University of Yaoundé 2 - Soa and at the Faculty of Economics and Management of the University of Dschang, for their various observations. Please accept, dear Doctors, the expression of my deepest gratitude.

To Dr. ZEUFACK Guivis, for his guidance in the empirical work of my second essay. May he find here the expression of my deep gratitude.

To the rest of my family, brothers and sisters and others, who have in one way or another, contributed to the finalization of this thesis through their unconditional, unfailing support and

multiform encouragement throughout the writing of this thesis. I would like to express my deepest gratitude to each and every one of them.

I cannot conclude without expressing my thanks to my classmates, friends and fellow travellers, both here and abroad, and to all those who have contributed to the success of this work, whether directly or indirectly, and whose names are not mentioned here. May they find here the expression of my gratitude.

ACRONYMS AND ABBREVIATIONS

ACP: Africa, Caribbean and Pacific

AfDB: African Development Bank

ARDL: Auto Regressive Distributed Lag Model

BCEAO: Central Bank of West African States

BEAC: Bank of Central African States

CEMAC: Communauté Economique et Monétaire des Etats de l'Afrique Centrale (Economic and Monetary Community of Central African States)

CIRD: International Centre for Dispute Resolution

CREA: Consortium for Economic Research in Africa

CVM: Chaînes de Valeurs Mondiales (Global Value Chains)

DOLS: Dynamic Ordinary Least Squares

DSGE: Dynamic Stochastic General Equilibruim

EBRD: European Bank for Reconstruction and Development

EC: European Commission

ECCAS: Economic Community of Central African States

EDF: European Development Fund

EU: European Union

FDI : Foreign Direct Investment

FGLS: Feasable Generalized Least Squares

FMOLS: Fully Modified Ordinary Least Squares

FRPC: Fonds pour la Réduction de la Pauvreté et la Croissance (Poverty Reduction and Growth Fund)

GABAC: Groupe d'Action contre le Blanchiment d'Argent en Afrique Centrale (Action Group against Money Laundering in Central Africa)

GDP: Gross Domestic Product

IBRD: International Bank for Reconstruction and Development

IDA: International Development Association

IFAD: International Fund for Agricultural Development

IFC: International Finance Corporation

IMF: International Monetary Fund

MIGA: Multilateral Investment Guarantee Agency

ODA: Official Development Assistance

OECD: Organization for Economic Cooperation and Development

OMZ: Optimal Monetary Zone

PCSE: Panel Corrected Standard Error

PMC: Performance Management Conculting

PVAR: Panel Vector Autoregressive

PVECM: Panel Vector error Correction Model

RBC: Real Business Cycles

TFM: Transferts de Fonds des Migrants (Migrant remittances)

UEMOA: Union Economique et Monétaire de l'Afrique de l'Ouest (Economic and Monetary Union of West Africa)

UN: United Nations

UNCTAD: United Nations Conference on Trade and Development

UNDP: United Nations Development Programme

UNFPA: United Nations Population Fund

UNHCR: United Nations High Commissioner for Refugees

UNICEF: United Nations Children's Fund

WAMZ: West African Monetary Zone

WFP: World Food Program

WTO: World Trade Organization

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

The objective of this thesis is to analyze the effects of capital flows on the economic cycles of the countries of the CEMAC zone. We opted for our thesis for an econometric approach based on panel data made up of all CEMAC countries. Our study period extends from 1985 to 2019. In the first chapter, we analyze the effect of remittances on fluctuations in economic activity in CEMAC countries. The methodological approach used is the PVAR. The results of this first chapter show that remittances directly influence fluctuations in the economic activity of CEMAC countries, on the one hand. And on the other hand, remittances play a stabilizing role insofar as they are counter-cyclical in nature with fluctuations in production per capita; which suggests, according to the literature, an altruistic motivation. The study also indicates that remittances, although interacting with other variables, can play a key role in mitigating the effects of negative shocks on production. Moreover, the relationship is unidirectional from remittances to fluctuations in economic activity. In the second chapter, we examine the effects of official development assistance on the economic cycles of CEMAC countries. This objective was achieved by using the ARDL method to capture the relationship between APD and cycle in the long term. The results reveal that in the short term, official development assistance, in addition to being negative, has no significant effects on the output gap of CEMAC countries. On the other hand, ODA, in addition to having a positive and statistically significant long-term influence on the output gap, is procyclical. This significance of ODA on the output gap is not negligible. Finally in the third chapter, we identify the link between FDI and the synchronization of economic cycles in the CEMAC zone. The methodology used to achieve this objective is based on Park's Generalized Feasible Least Squares (1967). The results show, on the one hand, that FDI has a positive effect on the synchronization of the economic cycles of the countries of the CEMAC zone; and on the other hand that the exuberance of economic cycles through short-term flows, international value chains resulting from foreign direct investment and specialization induced by risk sharing are the channels through which direct investment foreigners affect the synchronization of the economic cycles of the CEMAC countries.

Keywords: Remittances, official development assistance, foreign direct investment, economic cycles, CEMAC.

RESUME

L'objectif de cette thèse est d'analyser les effets des flux de capitaux sur les cycles économiques des pays de la zone CEMAC. Nous avons opté dans le cadre de notre thèse pour une approche économétrique basée sur les données de panel constituées de tous les pays de la CEMAC. Notre période d'étude s'étend de 1985 à 2019. Dans le premier chapitre, nous analysons l'effet des transferts de fonds sur les fluctuations de l'activité économique des pays de la CEMAC. L'approche méthodologique utilisée est le PVAR. Les résultats de ce premier chapitre montrent que les transferts de fonds influencent de façon directe les fluctuations de l'activité économique des pays de la CEMAC, d'une part. Et d'autre part, les transferts de fonds jouent un rôle stabilisateur dans la mesure où ils sont de nature contracyclique avec les fluctuations de la production par tête ; ce qui suggère, selon la littérature, une motivation altruiste. L'étude indique également que les transferts de fonds, bien qu'interagissant avec d'autres variables, peuvent jouer un rôle clé dans l'atténuation des effets des chocs négatifs sur la production. De plus, la relation est unidirectionnelle allant des transferts de fonds vers les fluctuations de l'activité économique. Dans le deuxième chapitre, nous examinons les effets de l'aide publique au développement sur les cycles économiques des pays de la CEMAC. Cet objectif a été atteint en utilisant la méthode ARDL pour capturer la relation entre APD et cycle dans le long terme. Les résultats révèlent qu'à court terme, l'aide publique au développement, en plus d'être négatif, n'a pas d'effets significatifs sur l'output gap des pays de la CEMAC. En revanche, l'APD, en plus de posséder une influence positive et statistiquement significative à long terme sur l'output gap est procyclique. Cette significativité de l'APD sur l'output gap est non négligeable. Enfin dans le troisième chapitre, nous identifions le lien entre les IDE et la synchronisation des cycles économiques dans la zone CEMAC. La méthodologie utilisée pour atteindre cet objectif repose sur les Moindres Carrés Généralisés Réalisables de Park (1967). Les résultats montrent, d'une part, que les IDE ont un effet positif sur la synchronisation des cycles économiques des pays de la zone CEMAC ; et d'autre part que l'exubérance des cycles économiques via le biais des flux à court terme, les chaînes de valeur internationale résultant de l'investissement direct étranger et la spécialisation induite par le partage des risques sont les canaux par lesquels les investissements directs étrangers affectent la synchronisation des cycles économiques des pays de la CEMAC.

Mots clés : Transferts de fonds des migrants, Aide publique au développement, Investissements directs étrangers, cycles économiques, CEMAC.

GENERAL INTRODUCTION

0.1 Background and rationale for the study

The past two decades have witnessed a rather unprecedented process of deregulation of financial markets and liberalization of capital flows. In quantitative terms, capital market integration has reached at least the levels seen during the Gold Standard. Qualitatively, the integration is probably much deeper than it was before (Bordo et al., 1998). At the same time, fluctuations in economic activity in some countries have declined (Stock and Watson, 2002) and changes in the characteristics of the business cycle appear to be related to changes in the degree of capital mobility (Basu and Taylor, 1999). Central African countries have certainly succeeded in attracting capital, but they have lagged in opening up their capital accounts. This delay has thus prevented local entrepreneurs from investing in foreign countries, and particularly within this region (Carmignani, 2010).

Economic theory, especially liberal theory, indeed implies that capital flows can have implications for the response of the economy to political shocks, and therefore for the volatility of the business cycle. The seminal work of Dornbusch (1976) Fleming (1962) and Mundell (1963) and for example, suggests that with flexible exchange rates, the impact of a monetary policy shock on output is all the stronger that the degree of capital mobility is high. On the other hand, the impact of government expenditure shocks on output decreases with the degree of capital mobility. More recent theoretical work (Sutherland, 1996; Senay, 1998, for example) essentially supports these results. This work uses a variant of the sticky-price dynamic general equilibrium model developed by Obstfeld and Rogoff (1995) to demonstrate that fluctuations[1] in output following monetary policy shocks increase with the degree of financial integration. However, increasing the degree of financial integration diminishes the short-term production effects of fiscal policy shocks (Bordo et al., 1998).

According to neoclassical theory, in the event of free competition and diminishing returns to capital in the capital market, capital should flow from the more capitalized country (developed country) to the less capitalized country (developing country) to balance the target marginal return on capital. The least capital-endowed countries are weakly integrated commercially and have asynchronous cycles. In reality, this theoretical prediction is not observed (Lucas[2]

[1] The work of Annen et al. (2016) evaluate the efficiency of wealth transfers through an RBC model in a closed economy. Two articles are considered as founders of the RBC current: the work of Kydland and Prescott (1982) and Long and Plosser (1983). One can also refer to King et al. (1988) for a discussion of the "canonical" model of RBC models.

[2] The Lucas paradox only considers the economic fundamentals and the imperfections of the capital markets by integrating the external factors taken into account in the traditional approach “Push-pull factors”).

paradox). In Central Africa, financial development could lead to an increase in investment by improving the accessibility of companies to financing (Levine, 1997).

Thus, capital flows in Central Africa have experienced a considerable decline in recent years. According to the UNCTAD World Investment Report (2019), these capital[3] flows vary from country to country in this community. However, this is a noticeable decline in Africa in general. This drop is around 3% in East Africa, 4% in North Africa, 66% in Southern Africa, 11% in West Africa and 22% in Central Africa. It should also be noted that the member countries of CEMAC abound in an immense potential in natural resources (oil, copper, cobalt, gold, etc.). This region is by nature heterogeneous with low diversification (ECCAS, 2009) of the economies of the community, very low trade.

However, three forms of capital flows will be considered in this thesis: remittances, official development assistance (ODA) and foreign direct investment (FDI). Remittances[4] to developing countries during the early 2000s were very large, both as a percentage of GDP and relative to ODA and FDI (De Supriyo et al., 2016). Given their size and the fact that they are used to finance recipients' consumption needs, remittances have enormous potential to offset negative effects on production during economic downturns and sudden stops in capital flows. . However, the potential of remittances to act as a counterweight depends on how remittances behave during fluctuations in the business cycle (Clemens and McKenzie, 2018). If remittances are counter-cyclical, then they could help smooth macroeconomic fluctuations. However, if they are pro-cyclical, they could amplify fluctuations in the business cycle. Durdu and Sayan (2010) in their work find that while countercyclical remittances can dampen macroeconomic volatility, procyclical flows have the potential to aggravate it.[5]

On the other hand, with regard to official development assistance, it could be argued that, with the exception of emergency relief, the main purpose of aid is not to act as an insurance device, but on the contrary to fuel economic development; in which case it is not clear a priori whether

[3] According to Ghazi Boulila (2007), capital flows from an accounting point of view "consist of foreign direct investment, portfolio investment, debt and real estate investments, and are recorded in the capital account and financial operations of the balance of payments". In our case, we will use three types of capital flows: remittances, ODA and FDI.

[4] The empirical literature on the cyclical behavior of remittances has been inconclusive. Studies like those of Frankel (2011), Bettin et al. (2015) find that migrant remittances are largely altruistic and countercyclical to the recipient economy. Other studies question these results and point out that the investment-oriented procyclical trend may be more widespread (Guiliano and Ruiz-Arranz, 2009).

[5] Several studies have investigated the ability of remittances to help reduce macroeconomic volatility. These studies vary in country coverage and methodology. Works such as Craigwell et al. (2010), Bugamelli and Paterno (2011), and Chami et al. (2012) find that remittances are negatively correlated with the volatility of output growth.

aid flows should be expected to be pro-cyclical or counter-cyclical. However, it is well established empirically that fluctuations in production negatively affect growth (Hamilton, 1989; Ramey and Ramey, 1995; Mendoza, 1997). Therefore, even if aid were only intended to promote growth, serious concerns would still arise that the patterns of aid disbursement contribute to the volatility of disposable income in developing countries. Thus, the impact of capital flows on the economic cycles of CEMAC countries can be elucidated through a question that will arise from the statement of the problem.

0.2 Statement of the problem

Since the 1970s, capital flows to developing countries have increased significantly. The world economy has also experienced several financial and economic crises, the latest of which is the subprime crisis. These crises negatively affected capital flows to countries and had an impact on cycles, i.e. the periods of recessions were very long. These crises in general and the financial crisis of 2007 – 2008 in particular had a significant impact on private capital flows to developing countries. Net flows fell by $752 billion in 2008, after a record high of nearly $1,223 billion in 2007 (IMF, 2009). Capital flows therefore fell by 40%, following the drop in short-term debt as well as foreign direct investment in stocks and bonds. These bond flows fell by 80% between 2007 and 2008 (IMF, 2009). Short-term debt as well as equity portfolio investments turned negative. They fell to record the massive capital outflows. The economy has become increasingly integrated with a global trend of financial liberalization (Abderahmane and Cuhal, 2011).

Indeed, liberalization however, has not been beneficial for everyone. As some economies grew, other so-called emerging markets experienced rapid economic expansion with increased trade and capital flows on the one hand; other countries, particularly those in the Middle East and Central Africa (the CEMAC zone in particular) are experiencing declining growth and remain on the margins of this integration. The question can therefore be asked whether this foreign capital has an effect on the fluctuations in the economic activity of the countries of Central Africa. This problem is acute, especially since the single monetary policy implemented in some countries[6] in this area seems ineffective due to the out-of-phase economic cycles of the countries and therefore their non-synchronization. Also, the countries constituting this zone are of very different sizes and the budgetary policies do not seem to be coordinated, the budgetary

[6] These are the CEMAC countries (Cameroon, Congo, Gabon, Equatorial Guinea, Central African Republic and Chad) which have a single currency: the CFA Franc.

deficits there are chronic and sometimes unsustainable (Hugon, 2007). These countries are also weakly integrated into world[7] trade. Moreover, if the economic cycles at the level of the countries of the community are driven mainly by external factors, the internal policy which aims at economic stabilization will probably have a weaker impact.

Moreover, the neoclassical theory is sharper when it comes to financial integration which, in turn, reinforces the contagion effect between countries. First, on the demand side, financial flows amplify the closeness of the cycle (Kose et al., 2003). Second, financial linkages amplify the shock wave of macroeconomic fluctuations. In addition, foreign investment stimulates the specialization of production by strengthening the allocation of resources towards sectors benefiting from a comparative advantage which gives rise to growing trade with the rest of the world; thus highlighting the effects of financial globalization.

Globalization is in line with the work of certain authors (Kose et al., 2003) and international organizations who believe that capital flows to developing countries are an effective means of stimulating growth. According to these authors, these flows constitute additional funds made available to local economies. They promote increased levels of investment, and therefore development. However, contrary to expectations, the outbreak of several financial and economic crises has challenged this idea. Capital flows have contributed to the outbreak and spread of the various crises. These flows have punctuated the evolution of certain flows of private capital to certain countries. Each of these crises has led to a drop in these flows. The largest drop was recorded following the subprime crisis of 2007 – 2008. Thus, it is important and inevitable to emphasize the destabilizing role of capital flows. Such an effect is likely to hamper economic cycles.

Such renewed interest in examining the link between capital flows and economic cycles seems to marginalize the CEMAC countries. However, the process of foreign capital flows from European and Asian countries as well as the low degree of financial integration which characterize the countries of the zone, invites us to invest in the study of the cyclical behavior of the member economies of the community. This study between capital flows and economic cycles in the CEMAC is, to our knowledge, a major innovation that will certainly allow the countries of the community to put in place measures likely to attract capital.

[7] The countries of the Community are generally of monoculture and are therefore little diversified. Their economic performance is thus dependent on the activities of vulnerable sectors, and in general on the production of one or a few raw materials.

Previous studies on capital and business cycles focused only on foreign direct investment, neglecting the impact of other forms of capital despite their importance. As part of our study, we will focus on three forms of capital flows: remittances, official development assistance and foreign direct investment. We consider different types of capital flows given the nature of each type of flow. Such a difference may affect the nature of the link between capital flows and economic cycles.

From this statement of the resulting problem, we formulate our research question as follows: What are the effects of capital flows on the economic cycles of the countries of the Economic and Monetary Community of Central Africa?

Three sub-questions derive mainly from our main question:

i. What is the effect of remittances on fluctuations in the economic activity of CEMAC countries?
ii. What is the effect of official development assistance on the economic cycles of CEMAC countries?
iii. How do foreign direct investments contribute to the co-movements of the economic cycles of the CEMAC countries?

0.3 Research objectives

The main objective of this research is to analyze the impact of foreign capital flows on the economic cycles of CEMAC countries. Within the framework of this thesis, we thus formulate three specific objectives:

i. Examine the effect of remittances on fluctuations in economic activity;
ii. Analyze the effect of official development assistance on the economic cycles of CEMAC countries;
iii. Investigate the effect of foreign direct investment on the synchronization of the economic cycle.

0.4 Research Hypotheses

To achieve the objectives set previously, this research work retains as the main hypothesis that foreign capital influences the economic cycles of CEMAC countries. This main hypothesis is subdivided into three subsidiary hypotheses, which will be the subject of our research work:

i. Remittances have a positive influence on fluctuations in economic activity;
ii. Official development assistance is positive and significant with the output gap;
iii. FDI has a positive effect on the co-movements of the economic cycle of CEMAC countries.

0.5 Literature review

This literature review will be done in two sections: a review of the theoretical literature and a review of the empirical literature.

0.5.1 Theoretical review

A synthetic literature review on the drivers of capital flows and business cycles is complicated in this theoretical review. There are several ways to measure capital flows. There are also potential explanatory variables reflecting the central role of capital flows in the global financial system and a large number of forces that can affect capital flows.

The financial crises that hit the world in general in the late 1990s and early 2000s highlighted disruptions in capital flow reversals on developing economies. These crises have triggered a lively debate among many mainstream economists, from which two opposing positions have developed. Some authors have focused on external conditions that underlie the supply of liquidity to underdeveloped countries. Thus, the concept of risk aversion on the financial markets and the international price of raw materials, as well as the rate of economic growth and the interest rate in certain countries such as the United States for example, represented the main determinants capital movements. In other words, the so-called push factors for capital flows have been highlighted by Calvo et al. (1993). Those who support this position, however, have not proposed the establishment of capital controls; rather, they pointed out that financial liberalization and capital flows had several collateral (and beneficial) effects, notwithstanding the potential risks for developing countries. The solution advocated by these proponents therefore depended on transforming the institutional framework and monetary governance of developing countries in response to international investors, aiming to reduce both corruption and government failures (Kose et al., 2006; Lampa, 2021).

Other economists have pointed out that domestic factors, in this case pull, are mainly responsible for the volatility of capital flows and the volatility of economic activity (Lampa, 2021), stipulating that the decisions of investors depend on both country risk and return on investment (Taylor and Sarno, 1997). Thus, national factors play a central role in determining

whether capital flows in or out of a country. In other words, developing countries should aim to guarantee a stable and trustworthy environment for investors, in particular for the reduction of their lack of moderate inflation and then for an implementation of reforms that guarantee a favorable environment for the financial market.

A well-developed financial sector facilitates communication between firms (foreign or local), customers and suppliers. Since the attractiveness of portfolio investments in transferable securities requires the existence of a stock exchange, the influx of capital into a country requires a highly developed financial sector for the latter. Financial development in itself involves the entry of new banks or new players into the local market with equity investments in the form of foreign investment or portfolio investment. Capital outflows meanwhile through a study by Boyce and Ndikumana (2001) show that capital flight on growth had been raised in the possible rivalry in terms of size, with the external debts of developing countries and the likelihood that debts will actually turn into flight funds; this therefore increased the danger of a severe growth depression in these economies. The capital flight itself is based on the World Bank's residual method, which can be adjusted to account for false commercial invoices. Trade misinvoicing could take the form of under-invoicing of exports and over-invoicing of imports (Ndikumana and Boyce, 2002; Ndikumana and Boyce, 2003). The resulting adjusted capital flight in a monetary union or not was the sum of residual capital flight and trade misinvoicing (Ndikumana, 2005).

That said, for a monetary union to be economically viable and profitable, the countries that form this union (Sarr and Ndiaye, 2011) must find themselves in the same phase of the cycle (expansion or recession), and at the same time. This symmetrical condition is considered a necessary condition for the success of a monetary union to ensure the stability of the common monetary policy of all countries, and that no monetary policy out of control will become synonymous with cyclical instability and deterioration. However, in a recent wave of literature, Frankel and Rose (1998) pointed out that one of the factors that makes business cycles more symmetric is the increase in trade between countries. Since the formation of a monetary union encourages financial integration, the synchronization of economic cycles can be the consequence of a unified result. In this sense, the consistency of cycles is not a condition that must exist ex-ante, but a condition that must exist ex-post. The synchronization of economic cycles after the fact thus represents a form of economic convergence of countries. The absence

of this form of convergence will result in an unequal distribution of the costs of unification, and corrective measures must therefore be taken.

Despite the extent of global trade and financial relations, some regions of Africa in general and those of Central Africa in particular have shown very distinct growth curves since the financial crisis of 2007-2008 (Kose and Prasad, 2010). These regions showed surprising resilience at the height of the crisis and quickly returned to growth. In contrast, others have experienced deep and persistent contractions followed by a slow recovery or double recession (Kose et al., 2012).

That said, for a monetary union to be economically viable and profitable, the countries that form this union (Sarr and Ndiaye, 2011) must find themselves in the same phase of the cycle (expansion or recession), and at the same time. This symmetrical condition is considered a necessary condition for the success of a monetary union to ensure the stability of the common monetary policy of all countries, and that no monetary policy out of control will become synonymous with cyclical instability and deterioration. However, in a recent wave of literature, Frankel and Rose (1998) pointed out that one of the factors that makes business cycles more symmetric is the increase in trade between countries. Since the formation of a monetary union encourages financial integration, the synchronization of economic cycles can be the consequence of a unified result. In this sense, the consistency of cycles is not a condition that must exist ex-ante, but a condition that must exist ex-post. The synchronization of economic cycles after the fact thus represents a form of economic convergence of countries. The absence of this form of convergence will result in an unequal distribution of the costs of unification, and corrective measures must therefore be taken.

Despite the extent of global trade and financial relations, some regions of Africa in general and those of Central Africa in particular have shown very distinct growth curves since the financial crisis of 2007-2008 (Kose and Prasad, 2010). These regions showed surprising resilience at the height of the crisis and quickly returned to growth. In contrast, others have experienced deep and persistent contractions followed by a slow recovery or double recession (Kose et al., 2012).

Indeed, economic theory does not give definitive indications concerning the impact of globalization, in particular the increase in financial ties on economic cycles (Kose et al., 2003). Due to strong demand effects, financial linkages can lead to a high degree of synchronization of business cycles between countries. For example, if consumers in different countries have a large share of their investments in a stock market, then a fall in prices on the latter could induce

a simultaneous fall in demand for consumption and investment goods in the countries in question.

Moreover, the contagion effects propagated by financial links could also lead to significant co-movements of macroeconomic fluctuations (Abraham-Frois, 1999; Grilli et al., 2015). International financial links can also stimulate the specialization of production[8] by redistributing capital in a way consistent with the country's comparative advantage in the production of different commodities. This specialization of production can lead to increased risks of industrial or national shocks, and must be accompanied by recourse to international financial markets to diversify consumption risks. We can expect this effect to be more vigorous for developing countries such as those of the CEMAC which are generally less diversified in terms of development, in terms of productive structures, and have a more volatile production; which implies that their potential gains from international risk sharing are even greater than for industrialized countries.

Thus, the intrinsic volatility of certain foreign capital flows can lead to instability and uncertainty. Economic cycles could be distorted and crises could occur more frequently. These effects can have a negative impact on long-term income levels. In addition, the procyclicality of capital flows has a negative impact on macroeconomic stability. Consumer spending and government spending tend to grow excessively during periods of money flows, and therefore adjust drastically when capital is no longer managed in the domestic economy. Lack of access to global foreign capital markets during difficult times can limit the ability of governments to implement countercyclical fiscal policies (Kaminsky et al., 2004; Reinhart and Reinhart, 2009; Caldéron and Schmidt-Hebbel, 2008). Authors like McKinnon (1973) and Shaw (1973) build the theoretical foundations of the financial liberalization school which states that *"financial liberalization is an effective means to promote economic growth and financial development"*.

However, according to the IMF (IMF, 2020a), increased financial, political and economic risks are predicted for the coming years, especially for countries with weak institutions and vulnerable economic fundamentals. Recovery from the COVID-19 pandemic here is likely to be uneven across and within countries (IMF, 2021a), and the uncertain post-pandemic economic outlook is associated with weak past global economic growth and low debt high (IMF, 2020a).

[8] The model of Long and Plosser (1983) departs from that of Kydland and Prescott (1982) by assuming that shocks are not self-correlated over time and that the construction time of capital goods is only one period. The origin of business cycles is found in the diversity of goods.

The combination of these different factors suggests that governments will have limited monetary and fiscal room for manoeuvre. High levels of private and public debt also raise concerns about future solvency (OECD, 2020a).

0.5.2 Empirical review

Several empirical works in the literature deal with the effects of capital flows, particularly foreign direct investment. To our knowledge, no study relates the effect of capital flows (particularly remittances, official development assistance and foreign direct investment) on economic cycles. We are also, to our knowledge, the first to analyze this theme for CEMAC countries.

Thus, studies have been carried out on linkages and capital movements which are relatively convincing. However, these studies essentially deal with the effects of developed economies on those of developing countries and other emerging countries (Kouparitsas, 2001; Lumsdaine and Prasad, 2003; Arora and Vamvakidis, 2004). Kouparitsas (2001), for example, observes a strong correlation between the countries of the North and the countries of the South, implying the existence of an international cycle affecting the countries of the South. However, the author highlights only one form of capital. Arora and Vamvakidis (2004) for their part point out that each fall in the growth of the American economy implies an equal reduction in the growth of the rest of the world. Lumsdaine and Prasad (2003) confirm the existence of a global cycle while identifying a more advanced European integration. The IMF (2009) considers that it is necessary to distinguish, among other things, a weak cycle of global slowdown and a major cycle of recession affecting in particular American demand towards non-oil exporting countries.

It is also argued that a financial crisis in a country receiving foreign capital causes a loss of asset values, not only in that country, but also in the countries of origin of the capital. In order to compensate for such a loss, banks raise their lending interest rates, which smooths production and reinforces cycles (Davis, 2009). On the other hand, the work of Busl and Kappler (2013) on the European Monetary Union concludes that financial integration has a positive effect on the correlation of cycles. Monnet and Puy (2016) partially confirm these results. The authors show that under the Bretton Woods regime, the correlation of business cycles was no weaker than that prevailing in the years 1984-2006, years characterized by strong financial globalization.

Studies have highlighted the fact that the growing financial globalization of the last two decades, including the spectacular increase in financial flows, has reinforced the contagion effect, both in the real sphere and in the financial sphere (Kose et al., 2003). Indeed, the growth of emerging countries is less and less dependent on developed countries and increasingly oriented towards other emerging countries in the South (Kose and Akin, 2007).

Calderon et al. (2019) arrive at the result that capital flows stimulate economic growth and development at various levels: first by removing credit restrictions by obtaining foreign capital, thus allowing companies to make more productive and riskier investments (Acemoglu and Zilibotti, 1997). Then the increase in inflows of foreign direct investment that can facilitate the dissemination of management techniques and practices and encourage an increase in the demand for skilled labour. Finally, deepen financial integration to increase the depth and breadth of the country's financial markets by improving efficiency and access to financial services (Chinn and Ito, 2006; Calderón and Kubota, 2014; Dziuba et al. 2021).

Work by Forbes and Warnock (2012), Bruno and Shin (2015) and Cerutti et al. (2017) use panel data regressions to investigate the relative roles of push and pull factors in driving capital flows. Using a methodological approach combining aggregate data for a large sample of advanced and developing countries over the period 1995–2017, Brauning and Sheremirov (2021) and (2022) investigate the transmission channels through which shocks affect the global economy and co-movements between countries of real economic activity. The authors find that openness to international trade matters more than financial openness in explaining cross-country spillovers. In particular, the production of countries with a high share of exports and imports reacts much more to monetary shocks than the production of countries with a low share. They also find that there is no material heterogeneity according to international investment positions or financial flows in the balance of payments.

Barattieri et al. (2021) empirically investigate the effect of exogenous tariff changes with a SVAR approach and show that they act as negative supply shocks, depressing GDP and increasing inflation with little effect on the trade balance. They propose a small open economy model with firm entry and endogenous exchangeability that successfully rationalizes the empirical evidence. Erceg et al. (2018) investigates the effects of trade policies in the form of import duties and export subsidies. They show that the macroeconomic effects of these policies depend critically on the reaction of the real exchange rate, which in turn depends on expectations about future policies and potential retaliation from trading partners. Furceri et al.

(2019) examines the macroeconomic consequences of price shocks and shows that these shocks are generally restrictive.

A significant empirical literature exists highlighting the link between trade restrictions and the business cycle, and separately, the impact of real exchange rate undervaluation on trade policy (Oatley, 2010; Bown and Crowley, 2013a; Grundke and Moser, 2019; Aurey et al., 2021). Eaton and Grossman (1985) study in a model the optimal tariffs when international asset markets are incomplete and show that they can be used to partially compensate for the lack of consumer insurance. Bergin and Corsetti (2008) also consider tariffs as policy instruments in addition to monetary policy, but they do not focus specifically on tariffs, but rather on the implications of monetary policy on the construction of comparative advantage. Campolmi et al. (2014) provide a detailed analysis of optimal non-cooperative policies with a wide range of instruments, including tariffs.

Moenius (2004) provides an important account of the effects of standards on trade between OECD countries at the industry level. Other studies exploit the number of notifications of newly imposed product standards by importing countries under the World Trade Organization (WTO) agreements on sanitary and phytosanitary measures and technical barriers to trade (TBT) or counter-notifications under sanitary and phytosanitary measures for a panel of trade flows (Disdier et al., 2008; Fontagne et al., 2015; Crivelli and Gröschl, 2016; Grundke and Moser, 2019). Crivelli and Gröschl (2016) find, for a disaggregated gravity model for agricultural and food products, that sanitary and phytosanitary measures decrease the probability of market entry, but positively influence the intensive margin of exporters. For a rich panel of data on French exporting companies from 1996 to 2005, Fontagne et al. (2015) show that restrictive sanitary and phytosanitary measures in the importing country (as reflected in Specific Trade Concerns (SCPs) raised in the WTO Sanitary and Phytosanitary Committee) negatively affect the extensive margin and, unlike Crivelli and Gröschl (2016), also the intensive margin of Commerce.

0.6 Scope of the study

The scope of this study is on the level of the practical and geographical perspective and on the theoretical level.

In terms of practical perspective and geographical coverage, this work contributes to empirical work on capital flows and business cycles. Particular attention is paid to some measurement

issues relevant to the identification of capital flow episodes. In this regard, the behavior of agents as drivers of capital flows as well as the probability of reversal of these capital flows between asset classes are the subject of particular attention. Moreover, the importance of capital flows on economic cycles to CEMAC countries is also explained by the strategy of integration into the global economy. The study of cycles here promotes understanding of the factors of economic dynamics, and can even serve as a support for the implementation of economic policy. Indeed, in order to integrate the global financial sphere and incorporate the new values of the liberalization of capital movements in our own economies, some developing countries must opt for a free flow of capital across their borders. They must also promote the participation of foreign investment and other forms of capital in their domestic financial markets. Such an attitude must have the effect of increasing the flow of capital in a considerable way, and especially the flow of foreign capital.

On the theoretical level, to our knowledge we have not found any study analyzing the effects of capital flows on economic cycles in the CEMAC zone, hence the reason for this study. On the other hand, we found very few studies on economic cycles in the CEMAC zone (Mbou Likibi, 2015) and in the WAEMU zone (N'Guessan, 2010; Gammadigbe, 2012). The literature focuses more on the individual effects of foreign direct investment in CEMAC. In view of all the above, our study will analyze the effects of capital flows, particularly remittances – official development assistance – foreign direct investment, on the economic cycles of CEMAC countries.

0.7 Methodological approach

Achieving the objectives of this thesis requires mobilizing an appropriate methodological framework that integrates the choice of methodological approach. To carry out this methodological approach, we will use economic and econometric models which will be developed in order to test the hypotheses put forward above. This research work being done in trials, each trial will give rise to a precise and concise methodological approach that will be developed.

As for our first test, our econometric specification will be inspired by the work of Chami et al. (2003), then Jackman et al. (2009) using panel data. The model estimation method will be based on the Panel VAR (PVAR) or PVECM. In order to better choose the appropriate method that will lead to the best results, the estimation process must vary according to the stationarity and

the degree of integration of the variables. If the variables are stationary in level, we will proceed to estimate a PVAR. If, on the other hand, the variables are stationary in first difference and there is a cointegration relationship between them, an error correction VAR is estimated on panel data or panel vector error correction model (PVECM). On the other hand, if the stationarity tests are I(0) and I(1), we will use the ARDL method (Auto-Regressive Distributed lag). It should be noted here that the use of this VAR method on panel data is justified by the fact that it does not impose a priori restrictions on the exogeneity and endogeneity of the variables. Also, this method makes it possible to capture both static and dynamic interdependencies. This method (PVAR) is a method that combines the unobserved individual heterogeneities between the countries in the sample and the traditional VAR approach which considers all the variables of the system as endogenous (Love and Zicchino, 2006). The variables to be taken into account in this first are: GDP per capita, remittances, financial development, inflation rate, real effective exchange rate, population growth rate, trade openness, private investment and private consumption.

As part of our second test, the Autoregressive Lag Time Model (ARDL) will be used to estimate our model. The advantage of using this method is that it is more appropriate for testing the existence of long-term relationships in small sample sizes, and unlike the approach of Johansen and Juselius (1990), the ARDL approach allows to test them between variables whose integration orders are different. Once the level of stationarity of our variables has been identified, the cointegration characteristics of the series in question will be exploited. The long-term cointegration interaction between the variables used will be captured using the cointegration test introduced by Pesaran et al. (2001) because it has the advantage of generating reliable and unbiased results when the variables are integrated of order I(0) and I(1), and not I(2) (Narayan and Smyth, 2004). The variables that will be used in this second are: the economic cycle variable, official development assistance, inflation, trade openness, population growth rate, money supply and domestic investment.

As part of the third essay, our empirical specification will draw on the work of Kose et al. (2003), Duval et al. (2014), Cesa-Bianchi et al. (2019) and Zouri (2020). The estimation technique will be the Feasible Generalized Least Squares (FGLS) of Parks (1967). This method is used when the number of countries is less than the number of years. On the other hand, if the number of countries is greater than the number of years, the Standard Corrected Panel Error (PCSE) of Beck and Katz (1995) is used. The variables that will be used in this third test are:

To carry out our research work, we will use data from secondary sources. These data come from the database of the World Bank (World Development Indicators), UNCTAD and World Perspectives. The study period was from 1985 to 2019. The different variables taken into account in this study are all available.

0.8 Organization of the thesis

In order to answer the questions posed above and in order to test our hypotheses, our research work is organized around three chapters:

i. Chapter I: Effects of remittances on fluctuations in economic activity;
ii. Chapter II: Official development assistance and economic cycles;
iii. Chapter III: Impact of foreign direct investment on the co-movements of the economic cycle of CEMAC countries.

CHAPTER I: REMITTANCES AND FLUCTUATIONS IN ECONOMIC ACTIVITY IN THE CEMAC ZONE

Introduction

Remittances have become an important source of foreign exchange and funds for many developing countries. Numerous studies explore the volatility of remittances and compare it

(Additions in millions of US dollars)

ɔther capital flows to developing countries (Frankel, 2010; Sayan and Tekin-ɛ Supriyo et al., 2016). Referring to figure 1.1 below and apart from official ɨsistance and foreign direct investment, wealth transfers such as remittances are an important source of foreign financing in developing countries (Batu, 2017). It is generally accepted that these remittances are commonly used for consumer goods to help recipients improve their living conditions. However, in addition to improving the well-being of recipients, the impact of remittances on overall economic performance remains unclear. Previous studies on the effectiveness of remittances have generally found different results, and researchers are skeptical about the impact of remittances on development (Mandelman and Zlate, 2012; Clemens and McKenzie, 2018; Lozej, 2019). Most current studies on the effectiveness of remittances have shown that there is no causal relationship between remittances and growth (Barajas et al., 2009).

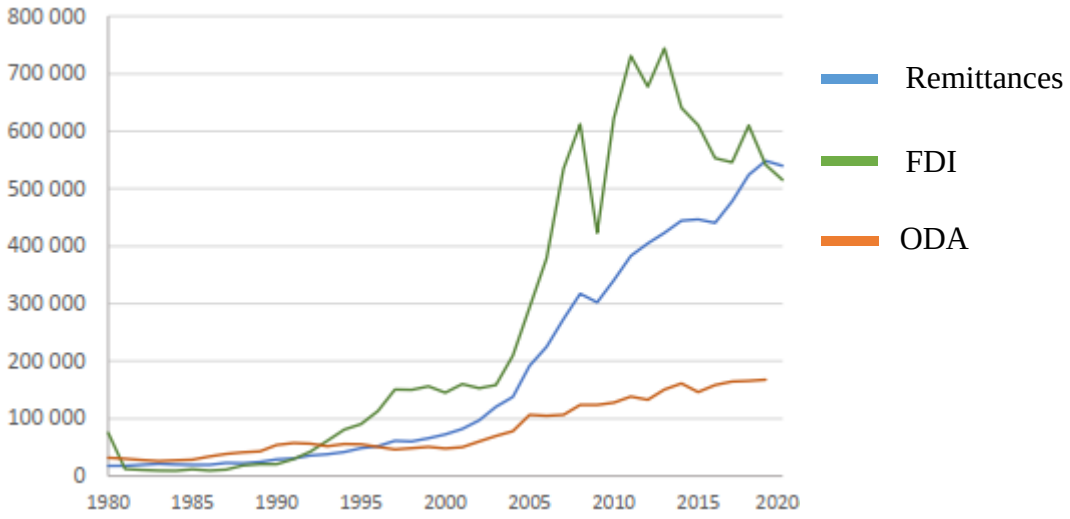

Figure 4. 1: Remittances, FDI and ODA to developing countries from 1980 to 2020 (Inflows in millions of US dollars)

Source: World Bank (2021).

In theory, the behavior of remittances over the cycle is linked to the motives for sending them. In the broadest classification, the motivation for sending remittances can be altruistic or self-interested (Lucas and Stark, 1985; Amuedo-Dorantes and Pozo, 2006). In the first case, remittances are seen as a unilateral transfer of personal benefits that are sent to relatives during

a major shock, and are often countercyclical[9] (De Supriyo et al., 2016). In the second case, remittances are generally used to invest in the country of origin and are procyclical in nature with the business cycle of the host economy. These remittances may have a high procyclicality, i.e. decrease or increase after fluctuations in the national economy (Ruiz and Vargas-Silva, 2014). In this case, host countries may have to cope with an additional impact from the extension of these increases or decreases.

Identifying the counter-cyclical nature of remittances can also have very important implications for the policies of recipient countries. Frankel (2010) points out that governments should not try to control remittances in the name of national development, but should allow migrants to send remittances without constraints. In other words, governments should avoid controlling the flow of remittances in order to direct them towards more productive uses. The free movement of remittances should enable these transfers to adapt to fluctuations in economic activity in the recipient countries in a way that has a positive impact on economic stability. Frankel (2010) calls this the *"smoothing hypothesis"*. Such a role for remittances is identical to what, in theory, would be expected from other capital flows, but does not occur in practice when there is a flood of capital flows during boom periods and a drought during economic downturns.

We argue here that the cyclical nature of remittances needs to be assessed within a dynamic framework, and that this relationship is unlikely to be stable over time. For their part, some authors believe that remittances can sometimes be countercyclical but, at other times, procyclical or even acyclical (Mughal and Ahmed, 2014; De Supriyo et al., 2016). Even if remittances are contra- (or pro-) cyclical on "average", it is possible for these flows to be strongly pro- (or contra-) cyclical during certain periods. Thus, it makes sense for us to ask the question What is the impact of remittances on fluctuations in economic activity in CEMAC countries?

The contribution of our research is that this analysis enriches the literature at various levels: first, it provides a broader overview of the theoretical literature on remittance motives and the implications that these different motives have on remittance behavior during fluctuations in economic activity in the CEMAC. Next, it documents a number of stylized facts about the

[9] In this case, remittances can increase dramatically when the national economy is in full recession. Remittances can therefore function as macroeconomic stabilizers that stimulate the recipient economy during downturns, and cool the economy during recoveries (Ruiz and Vargas-Silva, 2014; Bettin et al., 2015). Host countries could thus use these flows as part of broader stabilization policies.

cyclical dynamics of remittances within the co-emmunity. Finally, it studies the behavior of remittances during episodes of sudden stops and financial crises.

The aim of this first study is to analyze the impact of remittances on fluctuations in economic activity in CEMAC countries. The study shows that remittances have a direct influence on fluctuations in economic activity in CEMAC countries. On the other hand, remittances play a stabilizing role insofar as they are countercyclical in nature to fluctuations in per capita output, suggesting, according to the literature, an altruistic motivation. The study also indicates that remittances, while interacting with other variables, can play a key role in mitigating the impact of negative shocks on output. Notwithstanding the fact that remittances make it possible to cover current account deficits, they are also a source of upward pressure on inflation and the real effective exchange rate between countries in the community.

This first chapter is divided into three sections. Section I presents the evolution and impact of remittances in CEMAC. Section II will focus on the determinants of remittances in CEMAC. Section III presents the methodology used and an analysis of the various results obtained. The conclusion will bring this first chapter to a close.

Section I: Evolution and impact of remittances in CEMAC

1.1 Definitions and trends in remittances in CEMAC

1.1.1 Definitions

Remittances generally refer to financial or in-kind transfers made by immigrants to friends or relatives in their communities of origin. However, the statistical definition of international remittances only partially reflects the general interpretation.

The IMF (2009), the main source of statistics on international remittances based on Central Bank data, defines remittances in its balance of payments manual as the sum of the following components:

- **“Employee compensation”**

This includes the income received by temporary migrant workers in the host country, as well as the income of workers employed by embassies, international organizations and foreign companies (or “the income of frontier workers, seasonal workers and other short-term workers employed in an economy where they are not residents, and the income of residents who are employed by non-resident entities” (IMF, 2009). It should be stressed that this definition refers

to the total income of temporary migrant workers, although this income is not always transferred (at least not in full) to the country of origin, as migrants have to pay for their own means of subsistence. In addition, the salaries of people working for foreign employers (including embassies or multinational companies) are also counted as remittances, as civil servants, military personnel, diplomats and others are considered residents of their home country, although most of these employees are not true migrants and do not necessarily transfer their remittances (IMF, 2009).

– **"Personal transfers"**

These transfers include all current transfers in cash or in kind that are made or accepted by residents (migrant or not) of other countries or for the benefit of people in other countries ("all current transfers made by individuals for personal purposes" (IMF, 2009). Remittances can also be sent within a country, and not just from one country to another: these are internal remittances. Moreover, not all remittances are monetary or in kind. Social transfers are defined as "thoughts, practices and capital transfers from a community in one country to a community in another" (Levitt, 1998), such as innovative ideas, valuable transnational networks, knowledge, political values, policy reforms and new technical skills.

Another form of transfer exists: so-called informal transfers. By definition, informal transfers are not accounted for. The same applies to transfers of funds in kind. Three types of so-called informal transfers exist: direct transfers due to the actual movement of a migrant or emissary; sending a letter; and *"Hawala"* type remittances, which, according to El Qorchi (2002), refers to *"an informal network for transferring funds from one place to another, via the intermediary of brokers (hawaladers), whatever the nature of the transaction or the countries involved. Although this type of transaction is most often carried out by workers migrating to developed countries, it is also used to send funds from a developing country, although the purpose of the transfer is generally different"*. For Freund and Spatafora (2008), the amount could represent between 50% and 250% of formal remittances, particularly those recorded in the balance of payments.

1.1.2 Trends in remittances in the CEMAC region

It is difficult to obtain reliable data on the exact amount of remittances received by CEMAC countries, especially when illicit transfers are involved. Available statistics relate to remittances via official channels, but payments via informal channels can reach much higher amounts (World Bank, 2006). However, although the figures available are often linked to North-South

remittance flows, they do give an idea of the relevant flow of funds, and at global level, international migrant remittances are one of the sources of funding for developing countries (Muteta, 2005). Analysis of these funds not only enables us to assess their use in the countries of origin and the companies from which they originate, but also to examine the problems associated with the different channels used to transfer money.

Most Central African countries, particularly those in the Central African Economic and Monetary Community, have closer links with countries outside the region, partly due to the prevailing low level of intra-regional trade, limited networks in terms of transport infrastructure, resulting in a very low rate of intra-regional migration (Bazonzi, 2014). However, the vast majority of migrants migrate within the African continent: by mid-2020, almost 75% of all Central African migrants were living in another African country (World Bank, 2021).Repeated conflicts and instability throughout the region have also led to a large number of forced relocations. In 2020, almost 39% of the continent's migrants were refugees and asylum seekers (World Bank, 2021). Although the sub-region has had a free movement agreement since 1983, major obstacles still stand in the way of enhanced cooperation on migration policy.

Remittances account for a small share of GDP in the Central African countries for which data are available (see table 1.1) (World Bank, 2011). However, in absolute terms, Cameroon is the largest recipient of remittances in the sub-region (World Bank, 2021). In 2020, and compared with 2019, remittances in this subregion fell by almost 6.6% (World Bank, 2021).

Table 4. 1: Migration profile of CEMAC countries

Country	**Population (M inhabitants, 2009)**	**GDP per capita (2009)**	**Emigration (2010)**		**Immigration (2010)**		**"Migradevises received (2010 M USD)**
			Emigrant stocks	% population	Emigrant stocks	% population	
Cameroon	19,5	1170	279200	1,4	196600	1,0	148
Congo	3,7	1830	208600	5,6	143600	3,8	13
Gabon	1,5	7370	25200	1,7	284100	18,9	10
Eq Guinea	0,7	12420	103100	14,9	7400	1,4	NA
RCA	4,4	450	129300	2,9	80500	1,8	NA
Chad	11,2	610	243300	2,1	388300	3,4	NA

Source: World Bank (2011). na = data not available.

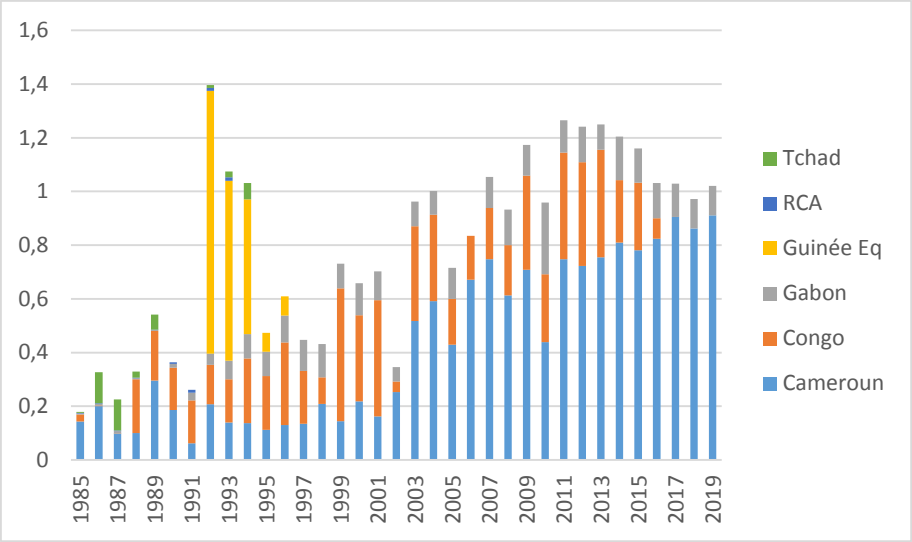

Figure 1. 2: Trends in remittances in the CEMAC region

Source: Author's construction, based on World Bank data.

Furthermore, from graph 1.2 above, we can see that migrant remittances are highly volatile from one country to another. In the sub-region, Cameroon is the largest recipient of remittances. The year 2019 was the year in which the country benefited most from remittances from its nationals abroad. After Cameroon comes the Republic of Congo, the second country in the Central African sub-region where remittances from migrants are very high. In fact, transfers operate in three directions: North-South, South-South and South-North, because some members of the diaspora receive money from their country of origin.

1.1.2.1 Analysis of South-South intra-regional remittance flows

According to the World Bank (2011), surveys of African families have shown that, compared to those who have not received remittances, those who have received remittances have better access to secondary and university education, information and communication technologies, health services, and banking services. These surveys also show that the average amount of remittances received by households from outside Africa is higher than the amount transferred within the region and within countries.

1.1.2.2 Analysis of financial flows from North-South transfers

The difficulties mentioned above are real, as the World Bank (2011) figures are based on estimates from the International Monetary Fund's balance of payments statistics, and therefore mainly concern all transfers from North to South. In addition, some CEMAC countries do not declare their financial flows.

The table below clearly shows the difficulties associated with the lack of data on remittances from Central African migrants. Of the six CEMAC member states, only one country has the latest data: Cameroon, which received US$2 million in "migradevises" (World Bank, 2011). For the sake of analysis, this does not prevent us from exploring other sources, even if they are not the most recent.

Table 1. 2: Amount of funds transferred by CEMAC migrants (in millions of US dollars)

	2007	2008	2009	2010	2011	Part du PIB en 2010 (%)
Cameroon	167	167	192	115	121	0,9
Congo	15	15	-	-	-	0,2 (2007)
Gabon	11	11	-	-	-	0,1 (2007)
Eq Guinea	-	-	-	-	-	-
RCA	-	-	-	-	-	-
Chad	-	-	-	-	-	-

Source: World Bank (2007, 2011).

In Cameroon, remittances reached US$103 million in 2005, representing 2.5% of official development assistance (World Bank, 2009). This amount has risen steadily, from 11 million in 2000 to 103 million in 2005 and 167 million in 2008, representing 0.8% of GDP in 2008 (World Bank, 2019). This situation is reflected in the evolution of financial flows generated in the country. The inflow came from migrants who settled in Europe, Brazil and other countries around the world, while the outflow resulted from high profits in the extractive sector (Melde and Schicklinski, 2011).

According to data from the International Fund for Agricultural Development (IFAD), Central Africa received almost $3 billion from its diasporas, or 7% of the total funds provided to Africa. Over the same period, North Africa, West Africa and Southern Africa received 46%, 27% and 5% respectively (IFAD, 2009). Consequently, these figures indicate that the amounts transferred to the region are relatively low (Moumouni and Nkoa, 2005). However, it should be stressed that one of the main difficulties in analyzing the financial flows generated by community migrants is that the geographical origin of the funds is not yet clear. Moreover, data on South-South transfers are not available.

The overall trend in remittances sent by financial courier to CEMAC over the period 2013-2016 is as follows:

Table 1. 3: Evolution of remittances in CEMAC from 2013 to 2016.

	2013	2014	2015	2016	Total
Total shipments (in Fcfa)	695918128080	694551351760	499088248400	339202739680	2228760467920
Total receipts in (Fcfa)	300051187520	308470844640	274498637280	288896805120	1171917474560

Source: GABAC (2018)

Analysis of transaction data has concluded that the CEMAC subregion possesses a structural deficit in the flow of funds between the financial message operator and the outside world from 2013 to 2016 (GABAC, 2018). Indeed, during the reference period, consolidated remittances from CEMAC amounted to 2228.76 billion FCFA, while receipts were only 1171.92 billion FCFA, a gap of 1056.84 billion FCFA over the same period. Over the same period, the volume of financial transactions between CEMAC and the rest of the world continued to decline in both sending and receiving (GABAC, 2018). Overall export shipments from CEMAC fell from FCFA 695.92 billion in 2013 to FCFA 339.20 billion in 2016, a decline of 51.26%. As for CEMAC's import volume, it stood at 288.9 billion FCFA in 2016 and 300.05 billion FCFA in 2013, a drop of 3.72%.

1.1.2.3 Remittances used in countries of origin

Generally speaking, diaspora remittances for the Central African sub-region can be individual or collective, formal or informal, monetary or in-kind, or purely financial (Mohapatra and Ratha, 2011). Monetary transfers generally include money donated by migrants as a personal investment, family or friend support, or even donations to charitable organizations. In-kind transfers mostly involve capital goods and merchandise that can be converted into cash. The most common uses for remittances are personal consumption, buying land or building houses, saving in a bank account in the country of origin, buying bonds or business development. Family aid is used to reduce budget deficits caused by needs linked to family events (weddings, christenings, funerals), education and healthcare, food and, to a lesser extent, clothing. These migrations are even more frequent when they are motivated by a sense of solidarity, altruism, even pride, an implicit agreement between the migrant and his or her family, or simply the migrant's personal interest (Mangalu, 2011).

1.1.2.4 Analysis of remittance circuits in the CEMAC region

Bank transfer and informal methods, involving individual carriers and informal money transfer agencies, are used interchangeably. Banking channels include émigrés' bank deposits, bank transfers (net provisioning of émigrés' accounts), postal transfers in countries with properly functioning post offices (postal exchange and transfers) and broadband networks (Western Union, Money Exchange, MoneyGram Exchange Express, WorldWide Services, Ria Envia, etc.) (Mohapatra and Ratha, 2011). There are also a growing number of local companies. This is the case of Express Union and Express Exchange covering Central Africa (Cameroon, Congo Chad), and parts of West Africa (Benin, Ivoiry Coast). Transfers via fast networks (Western Union, MoneyGram) play a fundamental role in financial transfer circuits, regardless of the direction of flow (North-South, South-South, South-North) (Mohapatra and Ratha, 2011).

However, for many migrants, informal transfer systems tend to be fast and discreet, requiring a minimum of written paperwork (Ndione, 2014). These are generally cheaper than formal systems subject to regulation and taxation, and are often available in areas not covered by formal providers (banks, money transfer companies, microfinance institutions). But this does not mean that these methods are secure. However, the risks incurred by migrants can often be hampered by the capital of trust enjoyed by the carrier, who is a family member, and the benefits (no cost, no legal restrictions) that the migrant derives from the transfer operation (Ndione, 2014). Although the number of money transfer companies is increasing and the number of transfers is decreasing, the bearer transfer method is effective for both intra-Community and North-South transfers (Ndione, 2014). It is mainly used for small remittances, non-emergency remittances and transfers of goods.

Finally, one of the biggest challenges associated with financial transfers in the CEMAC zone is the fact that migrants do not trust the banking system (Ndione, 2014). Several factors underpin this situation: relatively high transaction costs, the legal status of undocumented migrants, and much more. As a result, the financial flows sent through this channel do not reflect reality. Indeed, while American banks charge around 5% regardless of the amount of the remittance (World Bank, 2011), European banks charge around 10% for remittances of at least 100 euros and around 5% for remittances of at least 300 euros (De Bruyn and Wets, 2004). In the United States, the cost of remittances from Latin American migrants to their countries of origin has fallen sharply, from 20% to 15%, and is now around 5%, mainly for the following reasons: strong competition between money transfer companies (Western Union having lost its

monopoly on money transfers since the 1980s), lobbying by associations of nationals, the success of migrants in the "prepaid" payment card services set up by banks (World Bank, 2011). In this region, the cost of travel between countries is high, as it is still exposed to certain financial obstacles: 10% or more for transfers of less than US$100. In short, there is an urgent need to remove all obstacles to remittance transfers, in order to enhance their impact on the development of Central Africa in general, and the CEMAC zone in particular, to promote accessibility to money transfers and the free circulation of data on migrant remittances.

1.1.2.5 Obstacles to the spread of remittances

Remittance flows are driven by an increase in emigration. Remittance flows have increased in Africa over the last decade, with the exception of Central Africa and the Indian Ocean (PMC, 2010). The trend and scale of these flows vary according to the level of regional development, and the size and standard of living of the diaspora. An analysis of these global relocations shows that Africa has received around $39 billion from its diaspora, or some 13% of global flows (IFAD, 2009). While this participation is admittedly low, there are a number of obstacles to be overcome when it comes to disseminating reliable data on remittances to the metropolis. Two levels of obstacles stand out. Upstream, migrants may face legal uncertainties, preventing them from using official money transfer channels. In addition, banks and money transfer companies charge somewhat prohibitive fees. In CEMAC, increased competition in this sector has not yet led to a significant reduction in transfer costs.

Downstream, the low level of beneficiary banking and availability to remittance recipients is a major obstacle to the dissemination of remittance data (Ndione, 2014). Similarly, the low participation of remittance sector players (banks, postal services, money transfer companies, microfinance institutions, financial communication companies, cell phone companies), the lack of development of the financial sector in the countries of the sub-region as well as the inconsistency of this sector in certain countries constitutes a major obstacle to the dissemination of remittance data (Ndione, 2014). From this point of view, the lack of access to bank statistics or figures from transfer operators is a serious handicap in this zone. As a result, remittances in the community still face challenges of traceability, technology and access to financial services prices.

1.1.3 Trends in remittances between different sub-regional communities

According to the report on migration in Africa published by the World Bank (World Bank, 2011), some 30 million Africans live outside their country of origin, representing 3.3% of the total population of the African continent. These figures include voluntary migrants and international refugees, underestimating the scale and importance of migrants both within and outside Africa. The percentage of a country's immigrant population varies considerably across the African continent. Due to limited diversification of economic activities or countries with a history of conflict, this proportion is particularly high in sparsely populated countries (World Bank, 2011). The World Bank report of the same year also shows that Africans emigrate mainly within the continent, accounting for 64% of the total, ahead of OECD[10] countries with only 25%. This phenomenon is more significant at sub-regional level, as shown below:

- In Central Africa, 23% of migrants live in the sub-region, compared with 26% in East Africa and 39% outside Africa;
- West Africa has the highest rate of sub-regional migration, with 71% of all migrants staying within the zone, compared with 5% in Central Africa and 24% living outside Africa;
- Migrants from East Africa are mainly divided between their sub-region (52%) and countries outside Africa (41%);
- North Africa has the lowest rate of sub-regional migration (6%) and the highest proportion of migration outside the continent (94%);
- Around 65% of Southern African citizens migrate to countries in their sub-region, compared with 28% living outside Africa and 7% in East African countries.

Table 1. 4: Migration within and outside Africa

	Sub-region of destination					
Sub-region of origin	Central Africa	East Africa	North Africa	Southern Africa	West Africa	Outside Africa
Africa	3	13	2	11	21	50
Central Africa	23	26	0	9	3	39
East Africa	1	52	3	3	0	41
North Africa	0	0	6	0	0	94
Southern Africa	0	7	0	65	0	28

[10] Organization for Economic Cooperation and Development.

West Africa	5	0	0	0	71	24
Others regions	0	0	0	0	0	100

Source: World Bank (2011)

Migration within the sub-region is both voluntary and forced. In particular, movement within the community essentially reflects the existence of major economic pillars in the sub-region, as well as the occurrence of armed conflicts and natural disasters in the country of origin.

1.1.4 Importance of remittances in the economic development of CEMAC countries

The importance of workers' remittances in economic development, as evidenced by the literature and empirical analyses, can be understood through the following points.

1.1.4.1 A source of household income diversification

Remittances diversify household income sources, increasing the income of transfer recipients and indirectly through the multiplier effect (transfers benefit not only the families who receive them, but also their community). On the other hand, as an important source of income for many low-income families in developing countries, remittances stimulate consumption. They act as insurance mechanisms against adverse shocks (Lucas and Stark, 1985; Yang and Choi, 2007), making it possible to smooth consumption (Kannan and Hari, 2002). A large proportion of these resources are generally used for current consumption goods.

In some regions of sub-Saharan Africa, the proportion of remittances used for consumption can be as high as 80% (Maimbo and Ratha, 2005). Gupta et al (2009) show specifically that in sub-Saharan Africa, a 10% increase in remittance flows leads to a 1% drop in per capita poverty levels, followed by dispersion in per capita income. Lucas and Stark (1985), Kannan and Hari (2002) and Yang and Choi (2007)[11] have also highlighted the role of remittances in smoothing consumption. Remittances act as an "insurance mechanism" against shocks. According to a study by IFAD (2007), remittances account for over 10% of GDP in nearly 40 countries. Around a third of these resources go to rural areas, where they play a particularly important role in reducing poverty.

[11] Kannan and Hari (2002), Lucas and Stark, (1985) Yang and Choi (2007) « Les transferts de revenus des migrants : quel impact sur le développement économique et financier des pays d'Afrique subsaharienne », Bulletin de la Banque de France No. 173, May-June 2008.

1.1.4.2 A means of improving access to education

By easing family budget constraints, workers' remittances can reduce child labor and encourage school attendance. The results of surveys carried out jointly by the World Bank (2011) and the AfDB (2007) as part of the "Migration for Africa" project, showed that among households receiving remittances on the African continent, only two people completed secondary education, compared with 0.8 for households receiving no remittances. At tertiary level, the ratios for these two types of household are 1.2 and 0.4 respectively.

1.1.4.3 A means of improving health conditions

By increasing household income, remittances help to improve health conditions and ensure access to healthier, richer food and quality medical services. Drabo and Ebeke (2010), in a study of 56 developing countries, found that high per capita remittances are associated with better access to private treatment for diarrhea and fever, and that remittances complement foreign healthcare providers in poor countries. Another study by Nagarajan (2009) using panel data from 1993 to 2004 in the province of KwaZulu-Natal, South Africa, found that households that received remittances spent more of their funds on budgeting, health and food. Meanwhile, remittances enabled poor households to obtain good-quality medical care.

1.1.4.4 An opportunity to strengthen the financial sector

Remittances increase bank penetration rates, bringing together the population of financial institutions that previously had no access to banking services. Gupta et al (2009) attempted to determine the impact of remittances on the financial development of 44 African countries over six periods, taking the five-year average from 1975 to 2004. The results of their research confirmed that remittances favored the financialization of the region's economy. Although sub-Saharan Africa receives only a tiny proportion of remittances to developing countries, the estimated impact of remittances on financial development is comparable to that obtained from other jobs using a larger sample of countries. According to the results of surveys carried out as part of the "Migration for Africa" project, in Uganda in this instance, over 80% of remittance-benefiting households living outside Africa have bank accounts.

1.1.4.5 A means of promoting investment

Migrant remittances can contribute to increased investment in the form of land purchase, housing construction, agricultural equipment or entrepreneurship (Mohapatra and Ratha, 2011). Projects to build community facilities (schools, hospitals, and much more) are also financed by

migrant workers in their locality of origin. These actions help to improve access to basic services. Similarly, compared with current consumption expenditure, productive investment is generally of secondary importance. In fact, part of the transfer is used to set up a business. Some studies have highlighted the multiplier effect of remittances on fluctuations in economic activity. Econometric[12] tests carried out by Léon-Ledesma and Piracha (2004) with data from 11 Central and Eastern European countries show that remittances from migrant workers have significantly contributed to improving the level of investment in the economies of migrants' countries of origin. A study by Drinkwater et al (2009) in 20 developing countries found similar results. These results also show that remittances reduce unemployment, but not significantly.

1.2 Implications of remittances at macro level and effects of remittances on development at macro level in CEMAC countries

1.2.1 Macroeconomic implications

An examination of the macroeconomic impact of remittances, focusing on developing countries, reveals their positive effect on fluctuations in economic activity, access to financing and growth.

1.2.1.1 Stability and cyclicality of remittances

Remittances often operate in a counter-cyclical fashion. They can therefore act as insurance against macroeconomic shocks in the country of origin (Chami et al., 2009). During the financial crises in Mexico in 1995, Indonesia and Thailand in 1998, remittances increased (Ratha, 2007). They increase with natural disasters and political conflicts (Clarke and Wallsten, 2004; Mohapatra et al., 2009).

Thus, remittances behave very differently from most other private flows, which tend to be procyclical (Ratha, 2003; Frankel, 2010), particularly as most remittances involve transactions between members of the same household, and thus the motivation to pursue The flow of small private resources. Moreover, remittances are also less affected by changes in the priorities of different public aid donors, as well as their fiscal situation (World Bank, 2006). Remittances that have been adopted for investment can be procyclical, as they are sometimes located in middle-income countries (Sayan, 2006; Lueth and Ruiz-Arranz, 2008).[13] In sub-Saharan Africa, where private capital flows vary considerably from year to year, remittances are more stable

[12] International Migration Outlook SOPEMI, Edition 2005 and OECD (2006).
[13] Sayan (2006) finds that remittances are highly counter-cyclical in poor countries (e.g. Bangladesh and India), but pro-cyclical in middle-income countries such as Jordan and Morocco.

than foreign direct investment, private debt and equity flows (Singh et al., 2009; Gupta et al., 2009).

1.2.1.2 Sovereign solvency and external financing

Remittances can improve sovereign solvency by increasing the level and stability of foreign exchange inflows (Ratha, 2007; Avendano et al., 2009). Given their size, some African countries might have had much lower imports or larger current account deficits without remittances. Remittances also help stabilize the current account by reducing the volatility of total capital flows (Chami et al., 2008). Remittances can reduce the likelihood of current account reversals, particularly when they exceed 3% of GDP (Bugamelli and Paterno, 2011).

Correctly accounting for remittances can improve the assessment of the viability and credibility of developing countries' external debt. Remittances have now been included in the sovereign ratings of middle-income countries and the debt sustainability analysis of low-income countries (IMF, 2010). In many remittance-receiving countries, credit rating reviews by major rating agencies often use remittances as a factor in their rating decisions (Avendano et al., 2009).[14] However, less than half of African countries have received sovereign ratings from one of the three main institutions (Ratha et al., 2009). Obtaining and increasing sovereign ratings in African countries with sovereign ratings (after proper accounting of remittances) will facilitate the market entry of local entities, including companies and banks whose foreign currency borrowing capacity is mostly subject to the country's "sovereign ceiling" (Borensztein et al., 2007; Ratha et al., 2011).

The inclusion of remittances in the calculation of the debt-to-exports ratio provides a more accurate assessment of debt sustainability and the amount of fiscal adjustment that may be required to put debt back on a sustainable trajectory (IMF, 2009; World Bank, 2019). The joint IMF-World Bank debt sustainability framework for low-income countries now provides a clearer view of remittances by assessing countries' ability to meet their external obligations and borrow non-concessional loans from private creditors (IMF, 2010). The inclusion of remittances in credit analysis using the benchmark model of Ratha et al. (2011) shows that the creditworthiness of remittance-receiving countries can improve by one or two levels. However,

[14] The stability of remittances to the Philippines was a major factor in its ability to issue $750 million in bonds in the midst of the global financial crisis. Bangladesh first received a BB rating from S&P Investors Service and a Ba3 rating from Moody's Investors Service in April 2010, similar to the ratings of many emerging markets. The rating agencies cite remittances as a share of GDP and high growth rates as important factors in their rating decisions.

the poor quality of remittance data by country in many African countries makes it difficult to assess the extent to which the improvement in domestic credit could result from remittances to the African zone.

1.2.1.3 Economic growth, financial development and competitiveness

Migrant remittances can have a direct impact on economic growth by increasing consumption and investment spending, education and nutrition, and investment spending on health, thereby contributing to long-term productivity and improving the stability of consumption and production at both household and macroeconomic levels (Chami et al., 2009; Mohapatra et al., 2009). These benefits, in turn, increase investment flows from domestic and foreign sources through increased financial intermediation (Aggarwal et al., 2006; Gupta et al., 2009), which can ultimately contribute to greater growth (Ghirmay, 2004; Akinlo and Egbetunde, 2010)[15].

Remittances can also slow growth for a number of reasons. Firstly, large inflows of remittances can lead to an appreciation of the real exchange rate ("Dutch disease"), which can be detrimental to growth if market production produces external benefits, such as the effects of economies of scale and learning (World Bank, 2006; Acosta et al., 2009; Gupta et al., 2009). However, on average, remittances do not appear to have a significant impact on the competitiveness of developing countries (Rajan and Subramanian, 2005). This effect has been little noticed in Africa, except in a few small countries such as Cape Verde, where remittance income represents almost 10% of GDP (Bourdet and Falck, 2006).

Secondly, large remittances can reduce the availability of labor (Lucas, 1987; Bussolo and Medvedev, 2007; Chami et al., 2008). Indeed, there is little evidence of this phenomenon, and the choice of some people to work less does not have a significant impact on the performance of countries with high levels of underemployment.

Thirdly, some experts argue that additional income from remittances can reduce pressure to improve the quality of policies and institutions by making recipients less dependent on public goods (Abdih et al., 2008), or by providing sufficient foreign currency to alleviate government

[15] Acosta et al. (2009) earlier study of 109 countries over the period 1990-2003 shows that a well-developed financial sector can be a more effective intermediary between remittances and investment, and that the higher the level of financial development, the lower the impact of remittances on exchange rate appreciation. Higher remittance income is also associated with higher market capitalization, a key indicator of financial market development (Billmeier and Massa, 2009). The higher sovereign ratings resulting from remittances can translate into easier access for local entities to international financial markets, and hence higher levels of economic investment.

concerns about structural rigidities. However, other authors find that remittances have a positive effect on growth in countries with high-quality political and economic principles and institutions (Catrinescu et al., 2009).

The complexity of the growth process and the known problems of cross-border growth regressions complicate the determination of higher growth rates through remittances. Empirical specifications, including remittances in cross-border growth regressions, give contradictory results (Barajas et al., 2009; Singh et al., 2009). The lack of importance of remittances in some growth equations may indicate that their effects on human and physical capital are realized only over a very long period of time, that the effects are endogenous (i.e. they increase with the reduction in outcomes), or else that official data on remittances are of poor quality[16].

1.2.2 Impact of remittances on macroeconomic development

Remittances can help reduce poverty, encourage household investment and improve access to health and education services. This sub-section presents the literature on the impact of remittance trends in various developing regions, including Africa. It also examines recent observations gathered through surveys by the Migration in Africa project on the characteristics of households receiving remittances from migrants outside Africa and within the same country (Plaza et al., 2011). Although it is difficult to separate the impact of remittances from the overall impact of migration in empirical studies (McKenzie and Sasin, 2007), it is clear that receiving remittances is the main economic benefit of migration (World Bank, 2006). Findings on remittance-receiving households in countries of origin complement information on depositor characteristics in destination countries (World Bank, 2006; Bollard et al., 2010).

1.2.2.1 Effects of remittances on poverty and inequality

Remittances can reduce poverty levels by directly increasing the income of poor households receiving subsidies and aggregate demand, thereby increasing employment and wages among the poorest (Adams and Page, 2003). Cross-border regressions generally show that migrant remittances reduce the proportion of poor people in the population (Adams and Page, 2005).

Econometric analyses show that remittances have reduced poverty in Africa. Anyanwu and Erhijakpor (2010) concluded that in a sample of 33 African countries from 1990 to 2005, for

[16] Another cause contributing to the lack of significance may involve omitted variables such as the level of financial development (Giuliano and Ruiz-Arranz, 2009), institutions and policies (Catrinescu et al., 2009), and many other indirect channels through which remittances can affect economic growth (Rao and Hassan, 2009).

every 10% increase in the proportion of official international remittances in GDP, the proportion of people living in poverty would fall by 2.9%, with decreases also observed in the depth and severity of poverty (Michael et al., 2009). Gupta et al. (2009) concluded that although the impact of remittances on poverty in Africa is positive, it is not as great as in other developing countries. They attribute this result to the possibility that poverty itself may lead to increased migration and remittances.

Observations of the impact of remittances on inequality are unclear, as counterfactual incomes cannot be observed without migration (World Bank, 2006; Ratha, 2007). Remittance-receiving families, particularly those outside Africa, may be wealthier from the outset (family members are allowed to move first) and have higher incomes as a result of migration and remittance receipt. On average, remittances from outside Africa tend to be higher than remittances from other African countries or domestic sources (Bollard et al., 2010).

Unlike remittances from outside Africa, remittances from African countries can reduce inequality (Wouterse, 2010).[17] Households that receive remittances from other countries or domestic sources tend to be more evenly distributed between one-fifth of consumption expenditure. A similar analysis of wealth distribution using asset indices generally reflects these results[18].

1.2.2.2 Access to financial services

Remittances are often the only relationship many poor people have with the formal financial system. If financial intermediaries or banks (such as microcredit institutions or savings cooperatives) receive remittances, it is likely that some of these funds will be saved (Gupta et al., 2009; Aggarwal et al., 2006). Even when receiving deposits via money transfer companies or informal providers, recipients may deposit funds in some type of financial institution instead of hiding them under a mattress. A steady flow of remittances can also be used as a factor in assessing the creditworthiness of recipients of microcredit, consumer credit and small business loans (e.g. purchase contracts) (Ratha, 2007). Remittances also play a role in facilitating income flows for poor households facing high volatility and income shocks (Gupta et al., 2009). This reduction in income volatility could make them more attractive borrowers.

[17] Acosta et al. (2007) concluded in their work that remittances in Latin America reduce inequality on average, but that the extent of this reduction is relatively small and varies from country to country.
[18] A composite index of land ownership, electricity supply, housing quality and household amenities is used as a proxy for consumer spending (Filmer and Pritchett, 2001).

Section II: Literature review

This section will be devoted to firstly reviewing the literature on migrant remittances, and secondly elaborating on personal motives for sending remittances.

1.3 Remittances and fluctuations in economic activity: a literature review

An abundance of literature exists on migrant[19] remittances. However, the empirical evidence is still inconclusive as to how remittances respond to fluctuations in economic activity in migrants' countries of origin, and whether they can help alleviate economic hardship. At the microeconomic level, some studies have shown that the increase in remittances is intended to offset the negative impact on the income of relatives: this is altruism (Agarwal and Horowitz, 2002). In contrast, other studies (Lucas and Stark, 1985; Osili, 2007) have shown that remittances are positively correlated with the economic status of households back home, indicating that the motivation for remittances is self-interest, such as investment or inheritance[20]. In any case, a positive impact on migrants' income in the host country can translate into higher remittances (Bettin et al., 2012)[21].

Similarly, several macroeconomic studies have shown that remittances are negatively correlated with income levels in the host country (Chami et al., 2005; Frankel, 2011; Singh et al., 2011), mitigating the negative impact of food price shocks on the level and volatility of household consumption in vulnerable countries (Combes et al., 2014), reducing the volatility of production growth in developing economies (Bugamelli and Paterno, 2011; Chami et al., 2012), and responding positively to natural disasters (Yang, 2008; Mohapatra et al., 2012). On the other hand, other studies have shown that remittances are pro-cyclical in relation to host countries, thus corresponding to investment reasons (Lueth and Ruiz-Arranz, 2008; Giuliano and Ruiz-Arranz, 2009; Cooray and Mallick, 2013). And some studies have found no significant correlations with economic cycles in migrants' home countries (Akkoyunlu and Kholodilin, 2008) or with specific shocks such as armed conflict (Naudé and Bezuidenhout, 2012).

[19] Rapoport and Docquier (2006) and Stark (2009) offer a comprehensive review of the modern theoretical and empirical literature on remittances.

[20] Lucas and Stark (1985) and Osili (2007) both show that remittances are positively correlated with recipient household income. Similarly, De la Brière et al (2002) and Hoddinott (1994) show that remittances are positively correlated with household wealth.

[21] Macroeconomic studies have examined a wide range of potential determinants, including exchange rates (Faini, 1994), interest rate differentials (El-Sakka and McNabb, 1999), the size of the diaspora abroad and transaction costs (Freund and Spatafora, 2008), the skills and gender compositions of migrant populations (Adams, 2009; Niimi et al., 2010) and the interaction with immigration policies (Docquier et al., 2012).

The work of Ruiz and Vargas-Silva (2014) confirms the idea that the cyclicality of remittances in relation to the host economy varies by country or corridor, and is unlikely to remain stable over time. In particular, the degree of cyclicality may depend on other country-level characteristics (Arezki and Brückner, 2012)[22]. At the same time, microeconomic evidence suggests that as migrants' involvement and attachment to their loved ones and home country weakens, remittances will decline over time: this is the "remittance drop".[23]

Recent studies have also investigated whether remittances are an important channel for the propagation of global shocks (Barajas et al., 2010). Barajas et al. (2012) in particular argue that remittances can be destabilizing because they are more effective at channeling economic recessions than prosperity from the country of origin to the recipient country.

An important limitation of many cross-country analyses of the macroeconomic determinants of remittances is their dependence on global remittance flows to developing countries. To overcome this limitation, some studies (Lueth and Ruiz Arranz, 2008; Cooray and Mallick, 2013) use bilateral remittance data to verify recipient country characteristics, such as output fluctuations. However, in most cases, geographical coverage is limited to a single remittance corridor.[24] In other cases, the geographical perspective is broader but still limited. Lueth and Ruiz-Arranz (2008), for example, use a panel dataset for bilateral remittances for 11 recipient countries in Europe and Asia for the period 1980-2004. The same dataset was used by Barajas et al. (2012). Meanwhile, Frankel (2011) combined his data with other bilateral remittance data from the Inter-American Development Bank and the European Commission (Jimenez-Martin et al., 2007). Docquier et al. (2012) merged the sources used by Frankel (2011) with the European Central Bank database and the Romanian database; the resulting dataset includes 89 sending countries, but is still limited to forty-six recipient countries, both developing and developed.

[22] For example, Arezki and Brückner (2012) show that the impact of rainfall-induced income shocks on remittances decreases with a country's level of financial development.

[23] Amuedo-Dorantes and Pozo (2006), De la Brière et al, (2002) and then Makina and Masenge (2015), among others, show the existence of an inverted U-shaped pattern of remittances over time, consistent with the "remittance decay" hypothesis (Poirine, 1997). Remittances first increase due to an increase in migrants' earning capacity and strong initial commitment to relatives in the country of origin. Then, as attachment weakens and temporary migration often translates into permanent settlement, they tend to decline over time.

[24] Sayan (2004) and Akkoyunlu and Kholodilin (2008) focus on the Germany-Turkey remittance corridor, while Vargas-Silva (2008) and Ruiz and Vargas-Silva (2014) examine remittances between the USA and Mexico. Durdu and Sayan (2010) consider both corridors.

Many existing analyses are also subject to endogeneity problems. In many host countries, remittances account for a large and non-negligible proportion of GDP; consequently, with the exception of a few studies focusing on exogenous income shocks, reverse causality between remittances and GDP can bias the results (Yang, 2008). In a cross-national meta-analysis, this problem is resolved by the GMM technique (Cooray and Mallick, 2013) or instrumental[25] variables.

In studies using bilateral data, Frankel (2011) solved the endogeneity problem concerning the size of the migrant stock in his research, but did not consider possible differences linked to the GDP of the host country. Lueth and Ruiz-Arranz (2008) acknowledged this problem, but felt that GMM estimates based on lagging growth in recipient countries confirmed their findings. However, as concerns grow about GMM performance in the case of weak tools and over-fitting of endogenous variables, it is unclear whether these estimates can satisfactorily resolve the problem (Roodman, 2009; Bazzi and Clemens, 2013).

In studies using bilateral data, Frankel (2011) solved the endogeneity problem concerning the size of the migrant stock in his research, but did not consider possible differences linked to the GDP of the receiving country. Lueth and Ruiz-Arranz (2008) acknowledged this problem, but felt that GMM estimates based on lagging growth in recipient countries confirmed their findings. However, as concerns grow about GMM performance in the case of weak tools and over-fitting of endogenous variables, it is unclear whether these estimates can satisfactorily resolve the problem (Roodman, 2009; Bazzi and Clemens, 2013).

1.4 Personal reasons for migrant remittances

Remittances are essentially flows with two dimensions: individual and collective, which are closely linked. Initially, remittances are a transfer of income from migrants to individual recipients in their country of origin. This individual flow may be determined by different factors and conditions, depending on the financial situation of the migrant and the recipient, and the form of their relationship. This relationship is formalized in the form of a theoretical microeconomic model. This can be based on various assumptions about the reasons for sending. These reasons, also known as "motivations", theoretically determine the amount and frequency of remittances, but above all their evolution in relation to changes in the economic situation of host countries and the migrants' situation of origin (Drapier et al., 1997; Docquier and

[25] Abdih et al. (2012) analyze the impact of remittances on institutional quality and use geographical variables (coastal zone, distance to nearest sending country) to instrument remittances.

Rapoport, 2005). Secondly, what is observed at the macroeconomic level are the economic situations that are a determinant of remittances. The level of national production and its dynamics, the probability of finding a job, the interest rate or the exchange rate of a country can condition remittances and modify the economic situation of migrants and/or their families on the one hand, and on the other, by varying investment possibilities in both countries, as well as their profitability.

1.4.1 Personal reasons for sending remittances: from individualism to collective action

There are many reasons why migrants send money home. The reasons for sending remittances (decision, amount and frequency) are both common to and different from the migratory flows themselves. They are common first and foremost because these phenomena are interdependent. The "standard" international economic approach cannot explain this circularity, nor can it fundamentally explain the reasons for remittances, which appear to be no more than the externality of migration (Coiffard, 2012).

The reasons for migration and remittances are different, as empirical studies such as Funkhouser's (1995) show that the motives for migration are not sufficient to explain remittances. However, if the motives are common, the broader study of migration flows, benefiting from longer-standing scientific interest, should suffice to explain remittances. The findings of Funkhouser (1995) have challenged this assumption and led to a special study of the determinants of remittances. Excluding migration determinants, various transmission reasons emerged and a potential hypothesis for the observation of remittances was formed. These "individual" determinants can be considered from two angles: that of the migrants and/or their families.

1.4.1.1 A necessary distinction between the determinants of remittances and labor migration

Early work was supported by their theories, such as those of Lewis (1954), Todaro (1969) and Borjas (1987). These so-called probabilistic models focus on variables that influence and determine migration flows from the traditional rural sector to the formal urban sector. Wages in the formal sector are higher than in the traditional sector, and the supply of formal labor exceeds demand, leading to unemployment in the formal sector. The choice to migrate is based on maximizing migrants' expected income under the constraint of being able to find a job in the formal sector. Under the assumption that agents are considered rational, labor factor

mobility remains perfect between the two sectors, and subsequently the wage in the urban sector is fixed in the first place (Borjas, 1987).

However, this analysis leads to a paradox, Todaro's paradox (1969). This paradox states that *"an increase in employment in the formal sector can lead to an increase in unemployment"*. This paradox was certified by Todaro (1976), who acknowledges that this result depends on the resilience of migration to the probability of finding a job. Stark (1991) regards this situation as a special case of the model, and not as an automatic result. Moreover, this model is based on a very personal approach to migration, and does not allow for the integration of remittances. Migrants want to maximize their expected income, and the decision to migrate is entirely their own. In the study by Stark (1991 and 1995), this limitation can be overcome by considering migration as a collective process. From this point of view, international migration is an extension of the rural-urban migration model. Consequently, according to Massey et al (1993), *"In equilibrium, the international wage gap reflects only the monetary and psychological costs of international mobility"*. This type of discussion is in line with the mainstream "push-pull" model.

However, the explanatory scope of these studies was quickly called into question by Portes and Böröcs (1989), for example. In an article on the determinants of contemporary immigration and the theoretical analysis of the "integration model", the latter pointed out that the push-pull model is constantly challenged by the facts. While these models (from poor to rich countries) are used to explain the direction of immigrant flows, these theories do not explain differences between countries, nor differences between individuals (Portes and Böröcs, 1989).

A study by Funkhouser (1995) compares incoming remittances to two Latin American capitals (Nicaragua and El Salvador). Funkhouser (1995) seeks to determine the cause of the differences in remittances between San Salvador and Managua. This may be due to two reasons: firstly, migrants experience different self-selections in the two countries. Secondly, in migrant populations, other unobservable determinants cause different communication behaviors. According to the author, the unique characteristics of migrants are not sufficient to explain the differences in remittances received by migrant families. This author concludes that the dimensions of "migration" are linked, but their determinants are different. What Funkhouser (1995) calls *"behavioral differences"* can, according to Docquier and Rapoport (2005), be interpreted as *"different transfer motivations"*.

1.4.1.2 Personal motives: individual and family remittance motives

Migrant remittances are an interpersonal movement involving at least two people: the sender and the receiver, in the same unit: the household (or family, depending on the term). However, the driving force behind transfers within a household can be seen from two angles: the interests of the migrant or the interests of the household. Drapier et al (1997) distinguish two main types of motivation: personal and family. The first, individual motivation, from the migrant's unique point of view, can be broken down into three motivations that can explain remittances (altruism, exchange of services and strategic motivation). The second motivation, family motivation, rejects the assumption that the unit is totally transferable within the family. In other words, the family is seen as composed of heterogeneous individuals seeking to maximize their collective utility.

1.4.1.2.1 Individual motives: from the theoretical to the empirical

Personal motivations are akin to probabilistic models, as remittances are observed and conceptualized through the prism of the migrant. Migrant families are expressed as constraints or variables in the equation to maximize the migrant's utility (Coiffard, 2012). Lucas and Stark (1985) have specifically studied these personal motivations in the case of Botswana. Their method is based on surveys and questionnaires of migrants in the host country, particularly host families in the country of origin. The authors have identified various theories that may be behind these remittances. These motives are in fact a continuous line delimited by two extremes: pure altruism and pure egoism. Their results highlight the existence of a "mixed" motivation, meaning that in the case of Botswana they fall between the two limits. These reasons therefore appear to be non-exclusive. However, it is necessary to present them separately.

- **The altruistic motive**

Migrants send money to their families out of altruism. Their satisfaction or even well-being depends on their family's happiness. This model is based on several assumptions: firstly, the amount of the transfer is directly proportional to the migrant's income. Secondly, this amount decreases as family income increases. And finally, the amount decreases as family ties weaken (Stark, 1991). Only Lucas and Stark (1985) and Lowell and De la Garza (2000) have also observed this. These authors studied the impact of remittances on the development of communities and countries of origin in Latin America. This report shows the four main results of the "remittance transformation", in other words, of recent developments. The results are: the attractiveness of new companies on the remittance market; the development by new players of

innovative means of action to improve remittances. Expanding the role of migrant associations in the United States; the supply of the remittance market by migrants in the United States.

Funkhouser (1995) identifies further implications for the altruistic motive beyond the proportional relationship between migrant income and remittances: the poorest households proportionally receive the majority of remittances; remittances depend on the nature of the relationship between the migrant and the receiving household, and on the migrant's intentions to return; the remittances of each migrant are inversely proportional to the number of migrants in the same family in the host country; finally, the evolution of remittances depends on "the migrants' discount rate and the relative size of the income status" (Funkhouser, 1995) . In other words, if wages increase in the host country, remittances will also increase, but this increase depends on the trade-off between the expected consumption of migrants in the host country and the expected consumption of the host family in the home country. Works based on the hypothesis of the migrant's altruistic motive are more theoretical than empirical. Thus, as Docquier and Rapoport (2005) report, there is little scientific evidence for this type of behavior.

- **The selfish motive**

Unlike altruistic motivation, egoistic motivation is characterized by reliance solely on the migrant's well-being. Several factors support this hypothesis. The migrant may send money as an inheritance to ensure that his or her family has control over property in the country of origin (Brown, 1997). This hypothesis comes from Drapier et al. (1997) and corresponds to the "exchange of services" motive, thus forming part of the variations of selfish motivation. Selfish motivation can also lead to investment behavior (real estate, finance, social capital, public goods), as in the case of Greek immigrants to the USA, Australia and Germany (Glytsos, 1988, 1997). If this is the motivation for transfers, then the macroeconomic determinants influencing this tendency must be different from the altruistic motivation. Assuming that the economic situation in the country of origin affects the well-being of the migrant's family, the evolution of these situations, ceteris paribus, should theoretically be able to test the nature of the underlying motive. In the case of the selfish motive, an improvement in the economic situation in the country of origin is accompanied by an increase in remittances and the diffusion of these remittances into investment.

The final aspect of selfish motivation must be mentioned, although it seems to be the most controversial: strategic motivation. This motivation, proposed by Stark (1995), has been accepted and discussed by Drapier et al. (1997). The idea is that immigrants employed in the

host country have a certain level of productivity, corresponding to a certain level of remuneration set by the employer. In order to maximize their income, potential migrants will seek to choose the most productive people to emigrate. Then, migrants will use transfer payments to retain potential migrants whose productivity is lower than in their country of origin, so as not to reduce their remuneration.

1.4.1.2.2 Family motives

Family motivations are opposed to individual motivations centered on the migrant. The unit of reference here is the household, made up of the remittance sender and receiver. Family motivation is based on the assumption of market failure (Coiffard, 2012). This makes it possible to further integrate the economic conditions of the host country and the country of origin, by extending the contract model to the relationship between migrant and household.

1.4.2 Empirical approaches to the macroeconomic motives behind remittances

This sub-section will focus first on the characteristics of migrant and remittance-receiving populations, then on macroeconomic variables, and finally on the institutional variables that characterize migrants' host and home countries.

1.4.2.1 Reasons relating to demographic variables

In macroeconomic studies, the characteristics of migrants are generally limited to the stock of foreign migrants, sometimes supplementing their levels of eligibility when data are available (Docquier and Marfouk, 2006; Defoort, 2007). The stock of foreign migrants is an important explanatory variable for the number of remittances. Indeed, it is likely that the greater the number of senders, the greater the number of transfers. The work of Freund and Spatafora (2008) confirms this mathematical intuition.

In their report commissioned by the World Bank, Freund and Spatafora (2005) study the determinants of migrant remittances, their transaction costs and informal flows. Their main objective is to propose a methodology for estimating informal flows through empirical studies in 100 developing countries. Their results considerably reduce uncertainty about informal flows, which correspond to 35% - 75% of total flows. These results show a high degree of inequality between regions.

The level of qualification of migrants also appears to be a determining factor. According to a study by Faini (2007), based on data from Docquier and Marfouk (2004), there appears to be

an inverse relationship between the number of remittances and migrants' level of qualification. This work is part of a movement to address the question of *"Brain Drain versus Brain Gain"* in an attempt to estimate the overall impact of skilled migration from developing countries. This debate, which began in the 1970s with the work of Bhagwati (1976) in particular, has extended to the effects of skilled migrants and thus to their allegedly "compensatory" role.

1.4.2.2 The economic activity of remittances: countercyclical, procyclical or acyclical

Against the backdrop of the international financial crisis affecting both developed and developing countries receiving remittances, it is necessary to consider the structural and cyclical characteristics of remittances, in particular those linked to the economy of the host country and the country of origin. In 2010, an article by Mohapatra and Ratha (2010), economists specializing in remittances and migration at the World Bank, provided a method for predicting the evolution of remittances to developing countries during the international financial crisis. This method is based on observations of the evolution of remittances in relation to the economic cycles of the recipient country and the country of origin, but is also linked to one-off events (in this case economic crises, natural or man-made disasters).

Numerous empirical studies have shown that there is a strong positive relationship between remittances and economic activity in both home and host countries. In a recent study, Vargas-Silva and Huang (2006) propose a survey of the macroeconomic determinants of remittances in both sending and receiving countries. Their data come from five countries in Latin America and the Caribbean, with remittances mainly coming from the United States. The results show that remittances depend mainly on the macroeconomic situation of the host country. There are four possible situations. Firstly, factors linked to the host country and the country of origin have no significant impact on remittances. Secondly, conditions in both host and home countries can affect remittances, and macroeconomic variables in the host country predominate. Thirdly, home country conditions are of paramount importance. And fourth, both economies can affect remittances in the same way.

The work of Aydas et al (2005) for Turkey leads to the opposite results. The authors study the macroeconomic determinants of remittances in Turkey, taking into account the five main host countries of Turkish migrants. Their findings suggest that Turkey's GDP and growth rate affect incoming remittances. In this case, fluctuations in Turkey's production and growth affect remittances more than the economic cycle of the recipient countries. In view of such results, altruistic motivation seems to predominate. The results of Akkoyunlu and Kholodilin (2006)

counter these findings using a new database provided by the German Central Bank. On the other hand, according to their results, incoming transfers to Turkey are determined by German GDP (the authors use the Granger causality test), but seem indifferent to Turkish GDP. The authors attribute these results to the poor quality of the data used by Aydas et al. (2005).

Finally, the impact of GDP on remittances is not clear-cut. Lueth and Ruiz-Arranz (2008) on the basis of bilateral flows linked to 11 European and Asian countries, showing that there is a strong positive correlation between the economic activity of the host country and the amount of remittances. Buch et al (2004) and Elbadawi and Rocha (1992) in North Africa confirm that remittances are highly dependent on the GDP of the host country. In short, as Adams (2009) points out, the level of income in the country of origin can be positively and negatively correlated with the volume of remittances. Other macroeconomic variables are used to capture the country's economic environment, but these are generally more controversial. According to Aydas et al (2005), the difference in interest rates between the host country and the country of origin explains a large part of the evolution of remittance volumes. In contrast, El-Sakka and McNabb (1999) and Shahbaz and Aamir (2009) found a negative correlation between these same variables. The negative correlation between interest rate differentials and remittance volumes is a confirmation of selfish motivations, as migrants tend to return home for investment purposes when interest rates in the country of origin are high.

This relationship can also be analyzed in reverse: migrants send money to their families, but because the interest rate is too high, they can't get it from the bank. Adams (2006b) chose to test real interest rates to highlight the impact of real interest rates on the amount of remittances per capita. As a result, the author concludes that there is a positive correlation between these two variables. This result allows us to empirically verify the selfish motive and possible determinants of the transformation of remittances into investment.

Mouhoud et al. (2008) provide a summary table (table 1.5) showing the expected impact of key variables on the motivation for migrant remittances, whether altruistic or familial. As a result, the authors focus on different transfer variants, depending on the reason for sending.

Table 1. 5: The main determinants of remittances and their impact

	Altruistic	**Family contracts**	
		Exchange	Investment
Income level in host country	+	+	+
Income level in country of origin	-	+	+
Inflation in the country of origin	+	-	
Interest rate differential			+/-
Exchange rates	+	+	-

Source: Author, based on Mouhoud et al. (2008)

Finally, observations of macroeconomic variables and institutional characteristics in the home and host countries highlight various determinants of remittances (table 1.6). Firstly, economic activity, and in particular the economic activity of the host country (HC), appears to be an important factor in remittances. In some cases, in countries that rely heavily on remittances, perhaps even more so, the level of income in the country of origin has a negative impact on transfers. Table 1.6 shows the most important macroeconomic variables identified in the literature and their impact on remittances. Therefore, a positive sign indicates that the income level of a variable, such as country of origin (COO), is positively correlated with the payment of migrants entering that country. The last six shaded columns in table 1.6 show case studies of countries with high remittance/GDP ratios.

Table 1. 6: Selected literature on the main macroeconomic determinants of remittances

	El Sakka McNabb (1999) Egypt	Straubhaar (1986) Turkey	Huang et Vargas-Silva (2005) Mexico	Aydas et *al.* (2005) Turkey	Elbadawi et Rocha (1992) North Africa and Southern Europe	Gupta (2005) India	Mouhoud et *al.* (2008) Mediterranean basin	Shrooten (2006) Countries in transition	Karpowicz (2006) Cape Verde	Ponce et *al.* (2008) Salvador	Singh et *al.* (2009) SSA[26]	Lin (2011) Tonga
Stock of migrants abroad				NS	+						+	
Income level PA			+	+	+	+	+			-		
Income level PO			NS	-			-/+	+		+	+	+
Opportunity to be active PA		+	+				NS	+				
Unemployment rate								+				
PA salary	NS	+							+	+		-
Interest rate differential	-	NS		+			-/+	NS			+	
Country of origin												
Inflation (M2)	+		NS	-	-		-	-	-	(+)	-	+
Institutions									NS			
Black market	-			-	-						+	
Trade openness								-		-	-	
Political stability		-		-				-(guerre)		-		
Exchange rates (overvaluation)		(NS)	(NS)	(NS)			-/+	(NS)	NS	(NS)	- (dual) et -	-

[26] The sample includes 36 countries with an average dependency ratio from 2000 to 2010 above 3.30% for the sample (UNCTAD, 2018): Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Comoros, Congo, Côte d'Ivoire, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania and Togo.

Section III: Remittances and fluctuations in economic activity in the CEMAC zone: an empirical analysis

1.5 Methodological approach

1.5.1 The empirical model

To analyze the impact of remittances on fluctuations in economic activity in the CEMAC zone, we estimate a model in which remittances are a function of a set of independent variables constructed by exploiting information on migrants' countries of origin as well as bilateral information. Our equation is estimated according to a specification in which we observe the impact of remittances on fluctuations in economic activity in the presence of other financial flows and the level of financial development of the receiving country. Thus, drawing on the work of Chami et al. (2003) and Jackman et al. (2009), the following equations are estimated:

$$GDP_{it} = \alpha_i + \beta Rem_{it} + \varepsilon_{it} \quad (1.1)$$

Where α_i is the country-specific effect, GDP is a measure of fluctuations in economic activity, Rem represents workers' remittances and compensation of employees as a percentage of GDP, and ε is the error term observed for each country at i time t. β represents in this equation the parameter to be estimated, with an ambiguous sign given that remittances can have a positive or negative impact on fluctuations in economic activity (Bettin et al., 2015), and can also be countercyclical or then procyclical. If remittances are countercyclical, they should help to smooth economic fluctuations: in this case, the literature suggests an altruistic motivation. On the other hand, if remittances are procyclical, they act as a catalyst for economic volatility. The response of remittances to the long-term trend in production in the recipient country offers more evidence in favor of an investment motive for remittances: remittances motivated by investment may be particularly sensitive to the long-term prospects in the migrants' country of origin.

The preceding regression provides only a summary analysis of the relationship between remittances and fluctuations in economic activity. There are a number of other factors likely to affect volatility that are not explicitly taken into account when using basic bivariate correlation or regression analysis. To effectively incorporate these factors, a variety of empirical models linking remittances to economic volatility are examined. Consequently, this study augments the simple regression of remittances on economic fluctuations with some control variables that are popular in the literature. Both theoretical and empirical literature reveal that remittances respond to cyclical changes in economic activity. Officially, we have: (1.2)

$$GDP_{it} = \alpha_i + \beta Rem_{it} + \gamma X_{it} + \varepsilon_{it}$$

Where γ is the parameter estimate on the matrix of control variables, X which includes inflation, migrant population level, financial development, real effective exchange rate, trade openness, private investment and private consumption.

In detail, and following the specification of these authors (Chami et al., 2003; Jackman et al., 2009), the model can be summarized as follows:

$$GDP_{it} = \alpha_i + \beta Rem_{it} + \delta Fidev_{it} + \varphi Inf_{it} + \gamma TCE_{it} + \vartheta Pop_{it} + \mu Trade_{it} + \theta Invpr_{it} + \rho Conspr_{it} + \varepsilon_{it} \quad (1.3)$$

Where $Fidev$ is financial development measured by the share of credit to the private sector in GDP; Inf is inflation measured by the consumer price index; TCE is the real effective exchange rate; Pop represented the population rate; $Invpr$ is private investment; $Conspr$ is private consumption. ε is the standard error term. The description of our variables is as follows:

- GDP per capita: Fayissa and Nsiah (2010) use the logarithm of GDP per capita ($ constant 2000 prices). Pradhan et al (2008) use the annual percentage growth in real GDP per capita as a 5-year moving average and in annual data. In our case, GDP per capita will be used with reference to the literature;
- Remittances: This refers to the remuneration of workers and employees (in % GDP). This variable is introduced as an explanatory variable. Indeed, while remittances can contribute to growth, in this case a causal relationship can also be observed in the opposite direction. In other words, low growth can be a source of large remittance flows if migrants hope to make up the deficit or reduce their family income;
- Financial development: This variable is measured by bank credit to the private sector (in % GDP);
- Inflation: The consumer price index is the measure of this variable. An increase in demand-oriented migrant remittances when supply is constrained should translate, ceteris paribus, into an increase in the general price level. That said, the positive or negative impact of these remittances on the consumer price index cannot be ruled out in the community (Warsi et al., 2013; Nisar and Tufail, 2013);
- The real effective exchange rate (REER): The CER variable is selected as a measure of the competitiveness of CEMAC economies in order to assess its link with migrant

remittances. Remittances are expected to have a positive impact on the real effective exchange rate;

- Population: This is the migrant population;
- Trade openness: This measures the sum of exports and imports (as a % of GDP). The aim of this variable is to highlight the contribution of trade to private investment;
- Private investment: This variable is measured by gross fixed capital formation (% GDP);
- Private consumption: This variable is measured in this study by household final consumption expenditure (% GDP).

1.5.2 Estimation method

The estimation method is presented by determining the cyclical behavior of remittances and analyzing the interactions between macroeconomic variables.

- **Method for analyzing the remittance cycle and economic activity**

The method applied is based on serial cycle extraction tools. However, several filter methods exist in the literature[27]. The Hodrick and Prescott (HP) filter method (1997) was chosen for its flexibility. The HP filter is a mathematical tool used in macroeconomics, particularly in business cycle theory. It decomposes a time series X into two elements: a non-stationary long-term trend X_p , and stationary short-term fluctuations X_c , such as: $X = X_p + X_c$.

The idea is that, on average over the long term, cyclical volatilities should be zero. In addition, the series trend should show a growth rate with low fluctuations. Thus, solving the mathematical filter program yields the cyclical component of each of the two series by the formula: $X_c = X - X_p$.

Finally, a correlation and causality analysis is used to further investigate the cycle. Causality analysis on panel data is based on the Dumetriscu and Hurlin (2011) test. This test takes into account the heterogeneity of individuals in the sample in terms of non-causality in the Granger sense.

- **Model estimation method**

[27] Other filter methods include the Hodrick and Prescott filter (1997), the Baxter and King filter (1999), and the Christiano and Fitzgerald filter (2003).

The model estimation method will be based on Panel VAR (PVAR)[28]. The use of this VAR method on panel data is justified by the fact that it imposes no a priori restrictions on the exogeneity and endogeneity of the variables. In addition, this method makes it possible to capture both static and dynamic interdependencies. The literature presented above has noted the existing interaction between real GDP per capita, migrant remittances and other economic policy variables. That said, equation (1.4) below can be rewritten as a panel data autoregressive model (PVAR). This method (PVAR) combines unobserved individual heterogeneities between countries in the sample and the traditional VAR approach, which considers all variables in the system as endogenous (Love and Zicchino, 2006). Equation (1.4) thus becomes:

$$GDP_{i,t} = a_{1,0} + \sum_{j=1}^{n} \alpha_{1,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{1,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{1,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{1,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{1,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{1,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{1,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{1,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{1,j} Conspr_{i,t-j} + \varepsilon_{1,i,t} \quad (1.4)$$

$$Rem_{i,t} = a_{2,0} + \sum_{j=1}^{n} \alpha_{2,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{2,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{2,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{2,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{2,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{2,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{2,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{2,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{2,j} Conspr_{i,t-j} + \varepsilon_{2,i,t} \quad (1.5)$$

$$Fidev_{i,t} = a_{3,0} + \sum_{j=1}^{n} \alpha_{3,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{3,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{3,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{3,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{3,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{3,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{3,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{3,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{3,j} Conspr_{i,t-j} + \varepsilon_{3,i,t}$$

[28] Recent studies using VAR models on panel data are numerous. For example, Catrinescu et al (2009) analyzed the effects of institutional factors on the transmission of monetary policy in a mortgage market in OECD countries. Furthermore, Beetsma and Giuliadori (2011) and Lane and Benetrix (2010) used a VAR model on panel data to analyze the transmission of public spending shocks.

(1.6)

$$Inf_{i,t} = a_{4,0} + \sum_{j=1}^{n} \alpha_{4,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{4,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{4,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{4,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{4,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{4,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{4,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{4,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{4,j} Conspr_{i,t-j} + \varepsilon_{4,i,t} \quad (1.7)$$

$$tce_{i,t} = a_{5,0} + \sum_{j=1}^{n} \alpha_{5,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{5,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{5,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{5,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{5,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{5,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{5,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{5,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{5,j} Conspr_{i,t-j} + \varepsilon_{5,i,t} \quad (1.8)$$

$$Pop_{i,t} = a_{6,0} + \sum_{j=1}^{n} \alpha_{6,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{6,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{6,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{6,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{6,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{6,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{6,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{6,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{6,j} Conspr_{i,t-j} + \varepsilon_{6,i,t} \quad (1.9)$$

$$Trade_{i,t} = a_{7,0} + \sum_{j=1}^{n} \alpha_{7,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{7,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{7,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{7,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{7,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{7,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{7,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{7,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{7,j} Conspr_{i,t-j} + \varepsilon_{7,i,t} \quad (1.10)$$

$$Invpr_{i,t} = a_{8,0} + \sum_{j=1}^{n} \alpha_{8,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{8,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{8,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{8,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{8,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{8,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{8,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{8,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{8,j} Conspr_{i,t-j} + \varepsilon_{8,i,t}$$

(1.11)

$$Conspr_{i,t} = a_{9,0} + \sum_{j=1}^{n} \alpha_{9,j} GDP_{i,t-j} + \sum_{j=1}^{n} \beta_{9,j} Rem_{i,t-j} + \sum_{j=1}^{n} \delta_{9,j} Fidev_{i,t-j} + \sum_{j=1}^{n} \varphi_{9,j} Inf_{i,t-j} + \sum_{j=1}^{n} \gamma_{9,j} tce_{i,t-j} + \sum_{j=1}^{n} \tau_{9,j} Pop_{i,t-j} + \sum_{j=1}^{n} \mu_{9,j} Trade_{i,t-j} + \sum_{j=1}^{n} \theta_{9,j} Invpr_{i,t-j} + \sum_{j=1}^{n} \rho_{9,j} Conspr_{i,t-j} + \varepsilon_{9,i,t} \quad (1.12)$$

Generally speaking, the matrix writing of relations (1.4) to (1.12) can be summarized as follows:

$$Z_{i,t} = A_0 + A_1 Z_{i,t-1} + A_2 Z_{i,t-2} + \cdots + A_m Z_{i,t-m} + M_t \quad (1.13)$$

Z here represents the vector $(m \times 1)$ of the system of n variables under consideration. A_0 is the vector of $m \times 1$ constants. $A_{1,2,\ldots,m}$ represents the matrix $m \times m$ of coefficients to be estimated. M is the vector $(m \times 1)$ of the system of innovations. j is the optimal lag of each variable that minimizes the Bayesian Schwartz information criterion.

When cointegration occurs, PVAR from equation (1.13) is converted to a panel data vector error correction model (PVECM) as follows:

$$\Delta Z_{i,t} = \sum_{j=1}^{n-1} \Gamma_j \Delta Z_{i,t-j} + \Pi Z_{i,t-n} + \mu_{i,t} \quad (14)$$

With $\Gamma_j = \sum_{s=p+1}^{n} A_s - I$, et $\Pi = \sum_{j=1}^{n} A_j - I$

The rank of the matrix Π in model (1.14) above determines the number of cointegrating vectors. Therefore, if the matrix is of full rank (i.e $r = n$), then the PVECM reduces to the usual PVAR on stationary variables in the panel data context. In this case, model (1.13) is estimated instead of model (1.14). On the other hand, if the rank of the matrix Π is zero ($r = 0$), then the PVECM becomes a first-difference PVAR on first-order integrated series $(Z_t \to I(1))$ (Harris, 1995). In simpler terms, this means that if the rank is zero, there are no cointegrating vectors. Such a result implies that the variables are non-stationary and non-cointegrated. In this case, model (1.14) is estimated in first difference on the integrated variables of order one. If, on

the other hand, the rank is at least equal to one ($0 \prec r \prec n$), then there will be one or more cointegrating vectors, and model (1.14) becomes a PVECM.

The variance is then decomposed using the Cholesky method. Finally, the PVAR captures both the stochastic structure and the co-movement of variables, and therefore enables us to study the dynamics of deviations from long-term equilibrium in the countries making up the sample.

1.5.3 Data and variable measurements

The data used in this study comes from the World Bank (WDI). All data are expressed in annual terms. Macroeconomic data include GDP per capita, remittances, financial development, inflation, real effective exchange rate, migrant population, trade openness, private investment and private consumption. The study period runs from 1985 to 2019.

Our sample includes all CEMAC countries for a total of 210 observations. Table 1.7 below presents the descriptive statistics for our different variables.

Table 1. 7: Descriptive statistics for our study variables

Variables	Obs	Mean	Std.er	Min	Max
GDP/head	210	0	469,761	-1897,996	3104,46
Remittances	169	,165	,231	0	,979
Fidev	209	10,255	6,803	2,01	38,233
Inf	209	79,506	28,705	27,081	151,785
Pop	210	2,945	,795	,26	6,017
TCE	210	129,078	59,122	31,604	295,775
Trade	210	2,844	18,086	-100,971	49,761
INVPR	190	23,411	12,29	4,622	81,052
CONPR	144	6,498e+09	5,885e+09	1,036e+09	2,747e+10

Source: Author's calculations, based on World Bank data.

Thus, two estimation procedures will be set up: the first consists in checking the statistical properties of the different variables used, using unit root tests and Johansen-Fisher cointegration tests. The second involves estimating the model using the estimation procedure described above.

Before turning to the empirical results, we first analyze the various statistical properties of our macroeconomic variables, using stationarity tests and cross-correlation analysis. Three types of test have been considered: the Levin et al. test (2002), the Im et al. test (2003) and the Philippe-Perron test (1988). To conclude this section, cointegration was analyzed using the Johansen (1988) test. The choice of a large number of stationarity tests is due to the fact that each of these tests is biased. This leads us to believe that the determination of the order of integration of variables cannot be rigorously based on a single test (Keho, 2008).

Andrew Levin et al (2002) proposed the first panel data unit root test. The authors' test is inspired by the time-series work of Dickey-Fuller (1979) and Dickey-Fuller Augmenter (1981). The aim of using panel data is to increase the power of the test. The estimation procedure here consists in validating, under the null hypothesis, that each individual in the panel possesses an integrated time series of order one [I(1)] against the alternative which stipulates that the chronicle is globally stationary[29]. The advantage of such a test is that the authors show that the test statistic is distributed. On the other hand, one of the main limitations of the Levin et al. (2002) test lies in the homogeneous nature of the autoregressive root under the alternative hypothesis.

As for the test proposed by Im et al. (IPS) (2003), it addresses the criticism enumerated by Levin et al (2002). Indeed, Im et al. (2003) are the first to develop a test that allows, under the alternative hypothesis, not only heterogeneity in the autoregressive root $(\rho_i \neq \rho_j)$, but also and above all heterogeneity in the presence of a unit root in the panel. This test is stable, efficient and highly suitable for panel data models. Im et al (2003) construct a model with individual effects and no deterministic trend. In the absence of residual autocorrelation, their model is written as:

$$IPS: \Delta y_{i,t} = \alpha_i + \rho_i y_{i,t-1} + \varepsilon_{i,t} \qquad (1.15)$$

Where α_i, which is the individual effect, is defined by $\alpha_i = -\rho_i \gamma_i$, with $\gamma_i \in$, and where $\varepsilon_{i,t}$ $N.i.d.(0, \sigma^2_{\varepsilon,i})$. Like that of Levin et al. (2002), the test of Im et al. (2003) is a joint test of the null hypothesis of unit root $(\rho_i = 0)$, and also of the absence of individual effects because under the null hypothesis, $\alpha_i = 0$.

Another test for detecting non-stationarity in a time series is the Philippe-Perron (1988) test. This test is a non-parametric adaptation of the Dickey-Fuller statistic. Like the Dickey-Fuller test, the null hypothesis of the Philippe-Perron (1988) test is the presence of a unit root in the series under study $(H_0 : \rho = 0)$. The basic model required to perform this test is defined as follows:

[29] In fact, the major flaw of this test is that it imposes the homogeneity of the autoregressive root under the alternative hypothesis.

$$\Delta Y_t = \rho Y_{t-1} + \alpha + \beta_t + \varepsilon_t \quad (1.16)$$

Johansen's (1988) cointegration test is based on Engle and Granger's (1987) test. It is a test for detecting a possible long-term relationship between the different variables used. This test is only appropriate if the unit root tests show non-stationarity of the variables. Thus, cointegration analysis in Johansen's sense consists in studying the independence between two variables without making any a priori assumptions about the value of the coefficients linking them. In an error-correction model, this relationship is as follows:

$$Y_{t-i} = AY_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-i} + \varepsilon_i \quad (1.17)$$

1.6 Empirical results

In this section, in addition to the results of stationarity tests, we propose to analyze empirically the impact of migrant remittances on fluctuations in economic activity in CEMAC countries.

1.6.1 Unit root tests

The results of our stationarity tests (Table A1.1 in Appendix 1) show that none of the three tests is stationary in level. On the other hand, if we assume that there is specificity with a one-year lag at the level of each country in the community, then the stationarity tests lead to the results that all variables are integrated at unity [I(1)].

1.6.2 Cyclical nature of remittances

Cross-correlation analysis (Table A1.2 in Appendix 1) shows that migrant remittances are negatively correlated with GDP/head, financial development and private consumption. In contrast, remittances are positively correlated with inflation, real effective exchange rate, migrant population, trade openness and private investment.

This being the case, the findings that remittances are negative with fluctuations in economic activity attest to the counter-cyclical behavior of remittances between CEMAC countries. This result corroborates the work of Bettin et al. (2015) and Singh et al. (2010) insofar as these funds increase during periods of recession or economic crisis. Gbenou (2015) also finds the same result in his study for UEMOA countries. This correlation does not necessarily imply a causal link. That said, Table 1.8 below shows us, using Dumitrescu and Hurlin's (2011) causality test, that remittances cause GDP/head, while the converse is not possible.

Table 1. 8: Causality by Dumitrescu and Hurlin (2011)

Null Hypothesis:	W-Stat.	Zbar-Stat.	Retard	Prob.	Décision
Rem does not homogeneously cause GDP/head	5.18042	2.86116	2	0.0042	Rem cause GDP/head
GDP/head does not homogeneously cause Rem	2.35567	0.11914	2	0.9052	GDP/head ne cause pas Rem

Note: Homogeneous non-causality (HNC) is rejected for a probability of less than 5%.
Source: Author's calculations, based on World Bank data.

Two points can be made regarding the implications of the characteristics of remittances in the community: firstly, the counter-cyclical nature of remittances with GDP/head means that funds can smooth the cycle of fluctuations in economic activity in CEMAC countries. In other words, these funds can support low-income households and thus act as a stabilizer against negative shocks. Secondly, the transfer cycle can be predicted if the per capita production cycle is known. However, the high volatility of production and household incomes, as well as crisis events, have prompted them more than usual to seek help from relatives abroad. When demand for remittances exceeds supply, and migrants' response to demand is favorable, the remittance cycle becomes counter-cyclical with the output gap. This is based on the assumption of the altruistic motivation of migrants, who increase supply in bleak economic conditions in their home country and reduce it in the opposite case (Bettin et al., 2015).

1.6.3 Effects of remittances on macroeconomic variables

In order to analyze the impact of migrant remittances on the various variables used in this study, we propose to study in this subsection the model stability test, the Johansen cointegration test, the impulse response functions and the forecast error variance decomposition.

1.6.3.1 The cointegration test

After the unit root tests, which showed that all our variables are integrated of order one [I(1)], we now proceed to the Johansen cointegration test, which is an extension of the Maddala and Wu (1999) test. This cointegration test takes into account individual specificities and provides the cointegration rank. In order to obtain panel data statistics in advance, this test combines the individual Fisher and Johansen tests.

Thus, the Fisher statistics (Table A1.3 in Appendix 1) allow us to reject the null hypothesis at the 5% threshold of non-cointegration of the variables in our study, since the cointegration rank is greater than zero. Consequently, it is more appropriate to estimate the PVECM model (vector autoregressive error correction model on panel data). The PVECM here is a system made up of all our variables. In this respect, the contribution of remittances to the explanation of the

variance of the forecast error of the different variables in the model can be isolated, and this in a reciprocal manner.

1.6.3.2 Model stability test

The stability condition must first be examined. This stability condition implies that the PVECM is invertible, and its representation has the property of an infinite-order vector moving average representation (Abrigo and Love, 2016). The common way to decide whether the panel is stable is to calculate the modulus of each eigenvalue of the estimated model. Thus, the stability test of our PVECM (figure 1.3 below) shows that the inverse of the roots associated with the autoregressive (AR) part belongs to the unit circle of the complex plane. In other words, all points lie inside the circle. The stationarity condition is therefore satisfied.

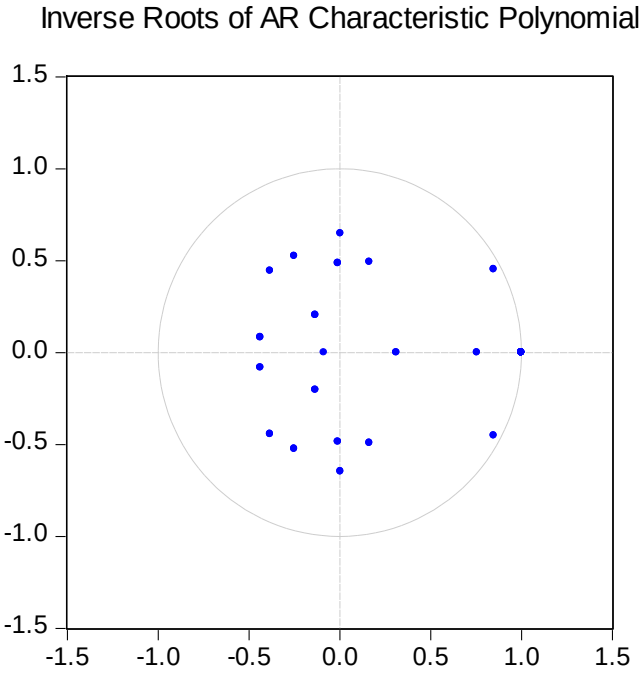

Figure 1. 3: PVECM stability test

Source: Author's construction.

1.6.3.3 Decomposition of the variance of the forecast error of a PVECM after 10 periods

In this sub-section, we present the variance decomposition of the forecast error of the variables. This Cholesky variance decomposition for CEMAC countries is performed after 10 periods (Table 1.9 below).

One of the most important features of PVECM is the variance decomposition of the error term. When analyzing the variance decomposition of the forecast error, it is important to note that the

order of the variables (especially the Cholesky decomposition) is very important. The main assumption of this Cholesky decomposition states that variables identified before others in the order affect all remaining variables simultaneously, while variables placed later affect only earlier variables, but with a time lag (Grossman et al., 2014). This assumption implies that higher-ranking variables are more exogenous, while lower-ranking variables are more endogenous (Shen et al., 2015).

In this study, remittances are given priority because they can affect other variables immediately, but are affected by them with a time lag. In second place comes financial development. The GDP per capita variable is the most common and powerful variable, essentially providing information on the general state of the economy, making it the most exogenous variable after remittances. Moreover, we expect this variable to affect all the other variables simultaneously, but to be affected by them with a time lag. This means that GDP/cap tends to react to shocks, and the effect of this variable on the other variables occurs with a lag. The other control variables - inflation, real effective exchange rate, private consumption, private investment, trade openness and population - are placed in the middle. The results are presented above.

Table 1. 9: Variance decomposition of forecast error after 10 periods (in %)

Period	GDP/head	Rem	Fidev	INF	TCE	CONPR	INVPR	Trade	POP
1	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	94.75334	0.270376	0.036751	0.001187	1.512946	0.099236	2.940110	0.384631	0.001424
3	92.00542	0.726126	0.855073	0.024940	2.111112	0.088160	3.795807	0.386897	0.006468
4	91.14794	0.919081	1.405067	0.032903	1.910439	0.107620	4.033876	0.381871	0.061200
5	91.26510	0.804204	1.194783	0.027603	1.687049	0.088831	3.987585	0.749208	0.195637
6	90.79713	0.745173	1.036918	0.024569	1.710261	0.077962	4.320448	0.899243	0.388296
7	90.01152	0.828003	1.022388	0.026614	1.772184	0.069022	4.731434	0.927872	0.610966
8	89.41688	0.894597	1.011272	0.032442	1.744235	0.061908	5.003433	1.030431	0.804803
9	89.07454	0.886287	0.948090	0.035255	1.692130	0.055916	5.231913	1.152867	0.923006
10	88.81366	0.878937	0.886371	0.038034	1.663753	0.050833	5.459610	1.242162	0.966644

Source: Author's calculations.

The results of the variance decomposition analysis of the forecast error after 10 periods indicate that 88.81% of GDP/capita is explained by its own innovative shocks. Furthermore, these results show that the effect of remittances on fluctuations in economic activity in CEMAC countries begins to increase significantly in the second period, and thus maximizes its effect at the end of period 10. At period ten, around 0.87% of the variation in GDP/capita can be explained by migrant remittances. Similarly, around 0.88% of the variation in GDP/capita can be explained by financial development in period 10. Also, around 0.03% of GDP/cap can be

explained by inflation in period 10. Furthermore, only 1.66% of the variation in GDP/cap explains the real exchange rate in period 10. Finally, the variation in GDP/cap explains private consumption, private investment, trade openness and population at the end of period 10 at 0.05%, 5.45%, 1.24% and 0.96% respectively.

Overall, we can say that this analysis of the forecast error variance decomposition shows that remittances contribute most to the variation in private investment (5.45%), the variation in the real effective exchange rate (1.66%), the variation in trade openness (1.24%) and the variation in credit to the economy (0.88%). In addition, these remittances contribute to a lesser extent to the variation in inflation (0.03%) and to the variation in private consumption (0.05%).

While all these results provide valuable information on the relationship between remittances and fluctuations in economic activity in the CEMAC, the strongest implication of the PVECM models can be extracted by the impulse response functions.

1.6.3.4 Impulse response functions

The results of the impulse response functions are shown in graph 1.4 below. In view of the results obtained from these impulse response functions of the variables to shocks from remittance innovations, we can say that a positive shock from remittances translates into an increase in the other variables in our model. That said, the positive effect of remittances on GDP per capita is maximal after four periods. In other words, an increase in remittances leads to an increase in real output. This result is in close agreement with the work of Fayissa and Nsiah (2010), where the authors report that a 10-point increase in remittances reflects a 0.4-point increase in GDP per capita growth for a sample of 3 African countries.

An increase in remittances has a positive impact on financial development (this variable is measured by the share of credit granted to the private sector in % GDP), where the maximum level is reached after 10 years. Thus, certain liquidity constraints are reduced thanks to remittances, and the latter reinforce the role of the financial sector in financing the economy.

Still in relation to graph 1.4 on impulse response functions and with regard to inflation, we can observe that a fall in remittances leads to a fall in inflation. Similarly, inflation rises slightly following a slight increase in remittances, and vice versa. Inflation reaches its maximum after one year, and its minimum after ten years.

However, although remittances increase household purchasing power, they also lead to increased spending on goods consumption, which in turn increases demand. This leads to upward pressure on prices (Nisar and Tufail, 2013). Rising prices will lead to an appreciation trend in the real effective exchange rate, losing competitiveness in the community. However, the results show that the real effective exchange rate increases with the increase in remittance payments, thus reaching its highest level after 3 years, and gradually decreases after the fourth year without cancelling out. This situation is specific to economies with a fixed exchange rate, and the financial and production systems are therefore underdeveloped. These results confirm those obtained by Vargas-Silva (2008) and Makhlouf and Mughal (2013) for the case of developing countries. Trade openness, on the other hand, peaks after 2 years and then declines. The same applies to the population variable, which peaks after six years, and whose slope is almost negative.

As for private consumption, it rises to reach its maximum level after three years, then falls again before rising again and converging towards its long-term equilibrium after ten years. The shock to these funds had a positive impact on private investment, which reached its maximum value at the end of the third year, although its minimum value was reached much earlier (at the end of the second year). Thereafter, this investment decreases. These results corroborate the work of Blouchoutzi and Nikas (2010).

In addition to the response of each variable to the remittance shock, it is very instructive to quantify their deviation from the long-term equilibrium, as the variance decomposition of the forecast error can be highlighted.

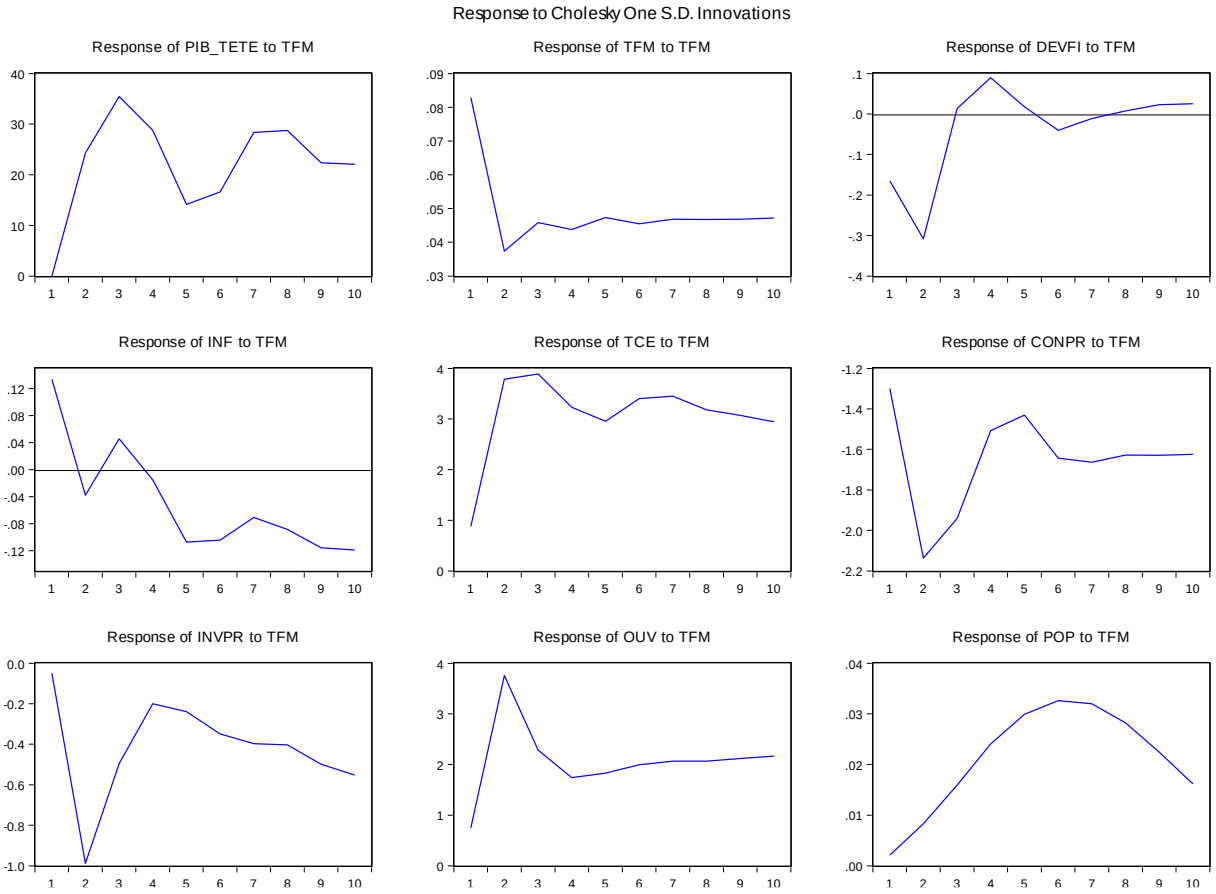

Figure 1. 4: Impulse response functions of variables to remittance innovation shocks using a PVECM

Source: Author's construction.

1.6.4 Robustness analysis

For robustness, we perform a two-step sensitivity test to test the robustness of our results. The first step involves changing the order of the variables, while the second step involves changing the measure of the dependent variable. For the latter step, instead of GDP per capita at constant prices, we use GDP per capita at current prices as shown in the work of Perez-Saiz et al. (2019), Hossain (2022). Subsequently we change the ordering of variables in the robustness analysis, as the ordering of variables is very important in VECM or panel VAR analysis. By ordering the variables, remittances remain in first position as it is the most exogenous variable. GDP per capita is placed at the end because it tends to be a response to shocks, and its effects on macroeconomic conditions occur with a lag. For the other control variables in this study, we have chosen to interchange their positions. After all these robustness checks, the result remains broadly unchanged, as remittances have a direct influence on fluctuations in economic activity in CEMAC countries. The results of the forecast error variance decomposition and the impulse

response functions are presented in the table and figure below (table 1.10 and figure 1.5, respectively).

The way remittances are used by households has important direct implications for fluctuations in economic activity. Households receiving remittances often channel these funds into investments in human capital, including health, education and food, which can affect long-term economic activity and thus reduce poverty (Adams, 2004; Docquier et al., 2012). For Mohapatra and Ratha (2011), the distribution of spending behavior of remittances received by families needs to be examined carefully when trying to assess the effect of remittances on growth, as not all receipts are spent on GDP-enhancing activities.

Table 1. 10: Variance decomposition of forecast error after 10 periods

Period	GDP/head	Rem	Fidev	INF	TCE	CONPR	INVPR	Trade	POP
1	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	98.71316	0.108816	0.013940	0.381225	0.708125	0.007214	0.006521	0.027562	0.033438
3	96.38658	0.097613	0.517563	0.332948	2.319809	0.138438	0.038577	0.024201	0.144268
4	95.94971	0.134003	0.627844	0.297222	2.366380	0.211107	0.067731	0.024517	0.321488
5	96.08412	0.158239	0.569083	0.260754	2.116582	0.175292	0.100867	0.038625	0.496438
6	95.95922	0.141063	0.513583	0.233580	2.203076	0.156581	0.106752	0.045668	0.640473
7	95.88368	0.127549	0.463332	0.212309	2.291094	0.141273	0.103467	0.045815	0.731480
8	95.96026	0.122638	0.419052	0.192069	2.270896	0.130465	0.098826	0.044908	0.760888
9	96.03076	0.114075	0.387374	0.177728	2.278366	0.122499	0.093846	0.046409	0.748942
10	96.07706	0.105701	0.373002	0.165192	2.311675	0.113763	0.087296	0.049716	0.716601

Source: Author's calculations.

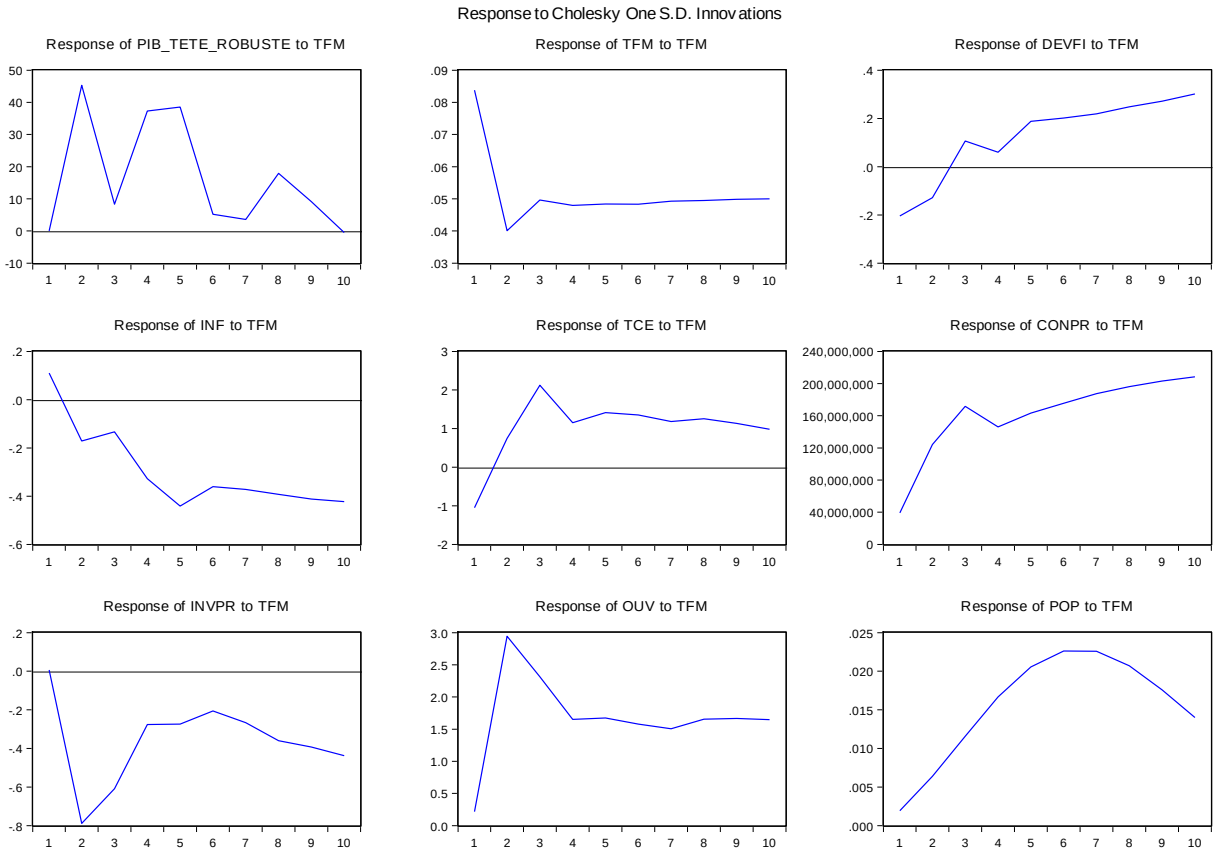

Figure 1. 5: Impulse response functions

Source: Author's construction.

Chapter conclusion

Migrant remittances have increased for the most part in the world in general and in developing countries in particular, where they constitute the second largest source of financing after ODA and FDI. The aim of this first chapter was to analyze the impact of remittances on fluctuations in economic activity in CEMAC countries. Stylized facts concerning the relationship between remittances and fluctuations in economic activity indicate that countries in which remittances are more widespread tend to have high rates of economic volatility. Similarly, in addition to the relative size of remittances received, fluctuations in these flows also have an impact on fluctuations in economic activity.

The econometric methods of our model listed above have enabled us to highlight several results. On the one hand, remittances have a direct influence on fluctuations in economic activity in CEMAC countries. On the other hand, remittances play a stabilizing role insofar as they are counter-cyclical in nature to fluctuations in per capita output, suggesting, according to the

literature, an altruistic motivation. The study also indicates that remittances, while interacting with other variables, can play a key role in mitigating the impact of negative shocks on output. Notwithstanding the fact that remittances help to bridge current account deficits, they are also a source of upward pressure on inflation and the real effective exchange rate between member countries. Our results also show that there is a one-way relationship between remittances and fluctuations in economic activity.

In view of the above, three main economic policy implications can be formulated: firstly, to reduce costs and increase transparency in remittance service conditions. Policies to promote financial sector development, such as encouraging competition between banks and benefiting other providers such as microfinance organizations, credit unions and postal savings banks, can have a beneficial impact on the remittance market. Secondly, CEMAC countries may need to monitor and forecast future remittance flows, and take these projections into account when modifying the orientation of fiscal policy. Thirdly and finally, CEMAC countries should encourage the financial system and operators involved in the remittance business to reduce the transaction costs associated with transfers, in order to encourage the use of formal transfer channels, thereby limiting the number of informal channels and optimizing their investment.

CHAPTER II: THE EFFECT OF OFFICIAL DEVELOPMENT ASSISTANCE ON THE ECONOMIC CYCLES OF CEMAC ZONE COUNTRIES

Introduction

It is widely recognized that the volatility of business cycles in developing economies is significantly higher than in industrialized countries (Dabla-Norris et al., 2015). As the empirical literature shows, notably the work of Pallage and Robe (2001), high welfare and growth costs are associated with volatile business cycles. Two common explanations for excessive fluctuations[30] in developing economies are: their characteristic exposure to external shocks and their inability to implement effective stabilization policies (Houndonougbo, 2017; Barattieri et al., 2021). Many resource-constrained economies rely heavily on external sources of income such as official development assistance[31] (Morrison, 2012). Moreover, empirical evidence shows that official development assistance is highly volatile. Using data for 63 countries from 1969 to 1995, Pallage and Robe (2001) and Bulir and Hamann (2003) estimate that aid flows are twice as volatile as output in recipient economies.

That said, aid effectiveness and its impact on growth, trade or poverty have received the bulk of attention in the aid literature (Hudson and Mosley, 2008; Arellano et al., 2009; Agenor and Aizenman, 2010; Huhne et al., 2014). The potential contribution of aid to high global fluctuations is particularly relevant since one of its main objectives is to reduce poverty and promote growth.

Our work is closely related to the handful of studies that have highlighted the role of economic cycles and crises in donor and recipient countries in determining aid allocations. Pallage and Robe (2001) find inconclusive evidence on the relationship between economic cycles in donor countries and aid disbursements to Africa between 1969 and 1992. Mold et al (2008) argue that the relationship between economic growth in donor countries and their aid spending is ambiguous. They show that aid flows and GDP tend to evolve simultaneously over long periods, but that aid often "decouples" from economic growth in OECD countries. Faini (2006) finds no statistical relationship between the output gap as a measure of the cyclical position of donor countries and aid flows over the period 1980-2004. In contrast, Bertoli et al (2008) document a robust positive relationship between the same cyclical measure and aggregate aid flows over the period 1970-2004. Allen and Giovannetti (2009) believe that the output gap cannot explain aid flows, but its cube has a negative and statistically significant coefficient, which they

[30] Abraham-Frois (1995) : « Cycle, instabilité et chaos », *Economica*, paris.
[31] According to Andersen et al. (2022), aid represents on average around 13% of gross national income (GNI) in low-income countries.

interpret as the proportional influence of the cycle on aid distribution exceeding the proportion. Frot (2009) estimated that banking crises in donor countries led to an average reduction in aid of 13% (level effect) and 5% per year after the crisis erupted (trend effect). Mendoza et al. (2009) find that stock market volatility in the USA (an indicator of financial stress and economic uncertainty) is associated with lower aid disbursements.

As far as the recipient country cycle is concerned, most of the existing evidence examines the determinants of official development assistance. For example, Pallage and Robe (2001) show that in half of developing countries, and in most African economies, there is a strong positive correlation between the cyclical component of aid receipts and that of domestic output. Svensson (2000) shows that the determinants of aid can be explained analytically by moral hazard arguments: in the second-best equilibrium with unverifiable government actions, the donor ties aid disbursements to the macroeconomic performance of the recipient country because he cannot distinguish whether downturns are caused by exogenous shocks or by macroeconomic mismanagement. Pallage et al (2006) argue that official development assistance can act as insurance against macroeconomic shocks in developing countries, reducing macroeconomic volatility and promoting long-term growth. All this raises the question of the effects of development aid on economic cycles. So, in view of all the preceding literature, it makes sense for us to ask the question: what are the effects of official development assistance on the economic cycles of CEMAC countries?

The aim of this study is to analyze the impact of ODA on the economic cycles of countries in the CEMAC zone. To the best of our knowledge, we have not found any study dealing with this theme in CEMAC countries. Our study contributes to the broader literature on official development assistance that deals with the specific determinants of recipients of aid flows (Burnside and Dollar, 2000; Dollar and Levine, 2006; Claessens et al., 2009). More directly relevant to our article is the development aid literature that shows that the level of aid distributed by donors can not only be an expression of pure altruism, but can also be influenced by national strategic factors (Eisensee and Strömberg, 2007; Fink and Redaelli, 2011; Raschky and Schwindt, 2012). For example, Fink and Redaelli (2011) show that, on average, donors favor smaller, geographically closer and oil-exporting countries, and display significant biases in favor of politically less aligned countries as well as towards their former colonies. Similarly, Raschky and Schwindt (2012) find that donor countries' decisions on the channel and type of

aid are affected not only by humanitarian needs, but also by strategic interests in trade and natural resources, as well as the quality of institutions in the recipient country.

The rest of our study is organized as follows: section I will highlight the stylized facts of official development assistance. Section II will focus on the foundations of official development assistance effectiveness. Section III presents the analysis methodology and the results obtained. The chapter ends with a conclusion.

Section I: Stylized facts

2.1 Stylized facts about ODA in the CEMAC zone

This section presents stylized facts on the structural dynamics of official development assistance over the last decade. It also provides a comparative analysis of the volumes of ODA received between the different countries of the community and other African regional communities.

2.1.1 ODA trends in the CEMAC zone

As defined by the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD), "Official Development Assistance" (ODA) refers to aid provided by states with the explicit aim of promoting economic development and improving living conditions in developing countries. It was adopted by the DAC as the gold standard for foreign aid in 1969, and ODA is still the main source of development aid funds.

Adopted by the DAC in 1969 as the standard for foreign aid, ODA remains the main source of funding for development assistance. Aid can be provided bilaterally, from donor to recipient, or through a multilateral development agency such as the United Nations or the World Bank. Aid includes grants, "soft" loans (where the grant element represents at least 25% of the total) and the provision of technical assistance" (Sethi et al., 2019; Jena and Sethi, 2021). ODA can be disbursed under different headings, namely social (which includes education, health, water supply, sanitation and social infrastructure), economic (transport and communications, energy, banking, commercial and other services) and production (agriculture, forestry and fisheries, industry, mining and construction, finally trade and tourism). In addition, aid may be targeted at several sectors, or may be granted for humanitarian reasons.

In addition to this general definition, the DAC has clarified several elements over the years that complement the definition of ODA. As Carey (2007) points out, the DAC has taken on particular responsibilities as the "guardian" of the ODA definition. The various guidelines prepared by the DAC Working Party on Statistics (WP-STAT) contain regularly updated information on various aspects of ODA. These details concern issues of coverage and eligibility of certain expenditures. Key changes include the inclusion in ODA of administrative costs related to the administration of aid administered by donor countries (since 1979) and the inclusion of the costs of hosting students and refugees from aid-recipient countries (since 1984 and 1991 respectively) (OECD, 2012). It should therefore be noted that, in general, improvements in the definition of aid over time tend to be broader than they are narrow (OECD, 2014).

Against this backdrop, more and more voices are calling for an in-depth review of the definition of official development assistance. Jean-Michel Severino's[32] publications on this subject have been particularly well received by those involved in development cooperation. In his view, ODA in its current definition is an "outdated" notion that is "on the way out" (Severino and Ray, 2010). This is due to the "triple revolution" in objectives, agents and tools that is shaking up the world of international solidarity (Severino and Ray, 2010). These authors even evoke "the end of official development assistance", which by its current definition is "not a sufficient or adequate tool for action" (Severino and Ray, 2010).

The evolution of ODA within the CEMAC economies is illustrated in graph 2.1 below. This shows that, of all the countries in the community, Cameroon receives the most external aid from donors. Figure 2.1 shows a meteoric rise in aid to Cameroon from one year to the next. After Cameroon comes Congo in second place, followed by Chad. CAR comes fourth, followed by Gabon and Equatorial Guinea. Between 2004 and 2005, and again between 2009 and 2011, Congo received more ODA than any other country in the community. Equatorial Guinea is the only country in the community to receive very little aid from donors. After all, aid flows follow a volatile trend within the community.

[32] Jean-Michel Severino was Director of Agence Française de Développement (AFD) between 2001 and 2010.

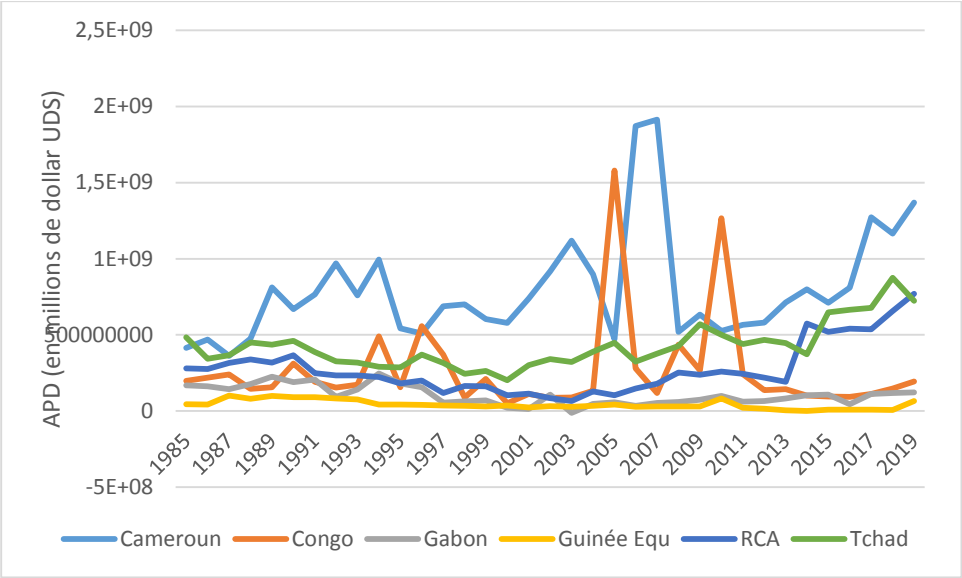

Figure 5. 1: ODA trends in the CEMAC zone

Source: Author's construction, based on World Bank data.

2.1.2 ODA trends in Africa

As shown in figure 2.2 below, East Africa is the region that receives the most official development assistance. The aid received by these East African countries is far greater than that received by the other regional communities. After East Africa comes West Africa, the second most ODA-receiving region in Africa. Central Africa comes third, followed by North Africa. Southern Africa finishes the podium among the various RECs (Regional Economic Communities) receiving aid from donors.

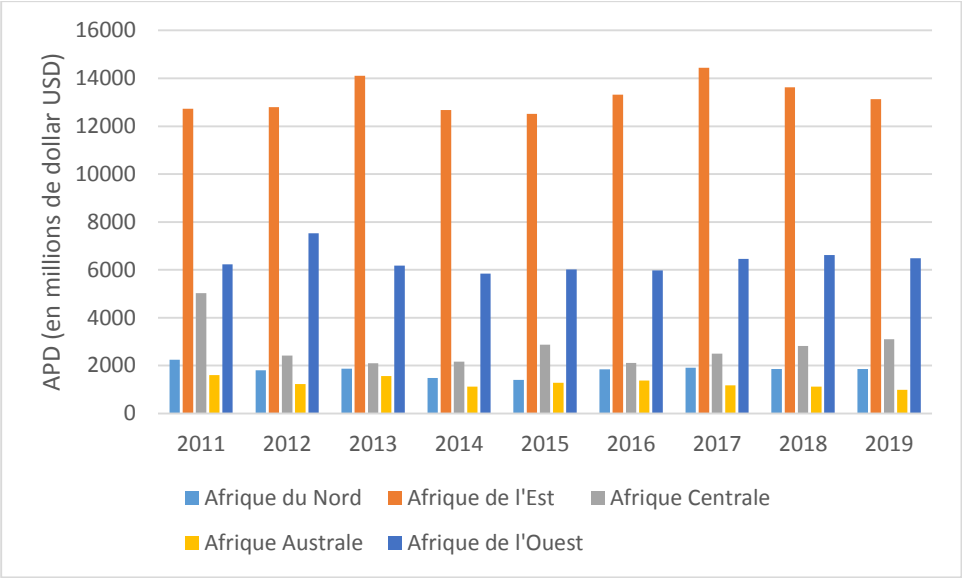

Figure 2. 2: ODA trends in Africa

Source: Author's construction, based on OECD data.

2.2 Origin of official development assistance

The flows of external aid known as "official development assistance" that are regularly provided to poor countries come from a variety of sources that can be classified into two main groups: multilateral donors (international institutions), and bilateral donors (state institutions specific to each donor country).

2.2.1 Multilateral donors

These include several international institutions. Aid from multilateral donors is conditional on purchase, and often includes substantial concessions. Their institutions are the defenders and promoters of development centered on international aid policy. The main multilateral donors are: international UN organizations, the European Commission (EC) and regional development banks.

2.2.1.1 The United Nations system

The United Nations system comprises the UN and 15 independent organizations known as "specialized agencies" (including the IMF and the World Bank Group). They are created by intergovernmental agreements, and linked to the UN through cooperation agreements.

Together[33], they provide technical assistance and other specific forms of aid in almost all economic and social fields. The main ones are:

2.2.1.1.1 The United Nations (UN)

In addition to its essential peacekeeping function, the UN plays a crucial role in forging an international consensus on development action, and works in a variety of ways to promote economic, environmental and social goals. The main objectives of the United Nations are: peace, the fight against poverty and disease, the raising of the standard of living, full employment and the promotion of economic and social conditions for development. To achieve these goals, the UN provides aid to poor countries through specialized[34] funds and programs.

UN aid flows are much more in the form of grants, and account for around 20% of total multilateral aid (Severino and Ray, 2012). Another significant share of multilateral funds comes from the Bretton Woods institutions, the World Bank and the IMF. These organizations bring together the community of nations and share a common objective: to raise living standards in their member countries.

2.2.1.1.2 The World Bank[35]

This organization is dedicated to long-term economic development and poverty reduction. The World Bank Group comprises five institutions: IBRD, IFC, IDA, ICRD and MIGA.

Founded in July 1944 at the Bretton Woods Monetary and Financial Conference, the International Bank for Reconstruction and Development (IBRD), commonly known as the World Bank, is a pillar of the international financial institutions. It has since been supplemented by the International Finance Corporation (IFC), created on July 20, 1956, the International Development Association (IDA), created on September 24, 1960, the International Centre for

[33] Many institutions, such as the Bretton Woods institutions, the ILO and many others, existed before the creation of the UN.

[34] These include: UNDP (United Nations Development Program), the main multilateral donor for sustainable human development. This organization plays an active role in achieving the development goals set out in the Millennium Declaration. UNICEF (United Nations Children's Fund) is the principal United Nations agency concerned with the protection, survival and long-term development of children. Its work focuses on immunization, nutrition, primary health care and basic education. WFP (World Food Program), which provides food aid as part of emergency relief and development programs. UNFPA (United Nations Population Fund), the world's largest provider of international population assistance. UNCTAD (United Nations Conference on Trade and Development), which promotes international trade. This organization works closely with the independent WTO (World Trade Organization) to promote exports from developing countries, with the help of the International Trade Centre. The UNHCR (United Nations High Commissioner for Refugees) is responsible for providing emergency aid to refugees in times of conflict.

[35] https://www.banquemondiale.org/fr/about

Dispute Resolution (ICDR), created on October 14, 1966, and the Multilateral Investment Guarantee Agency (MIGA), created on April 12, 1988. These five institutions now form the group known as the World Bank.

- **The International Bank for Reconstruction and Development (IBRD)**

The IBRD has two instruments of intervention: loans (to finance investment projects on the one hand, and adjustment loans to support governments in implementing economic, financial and structural reforms on the other). Then there are guarantees (to offset the risk of default on government debt, and to offset the credit risk of the private sector). IBRD sources are reserved for countries considered to have a high debt repayment capacity. Thus, the IBRD's main borrowers are emerging and transition countries. IBRD loans can be disbursed more rapidly, but are less advantageous (in terms of interest rates and payment terms) than IDA loans.

- **The International Development Association (IDA)**

This organization is the main source of financing for basic social services in poor countries. Its aim is to enable the poorest countries with no access to capital markets to benefit from financing on preferential[36] terms. Only countries whose per capita income does not exceed a certain threshold ($965 per capita in 2005) are eligible for these resources. Around 40% of IDA resources now benefit sub-Saharan Africa (Severino and Ray, 2012).

- **The International Centre for Dispute Resolution (ICDR)**

This is an independent arbitration body for disputes between governments and private investors.

- **Multilateral Investment Guarantee Agency (MIGA)**

Its objective is to facilitate efficient private investment by covering non-commercial risks, and to provide its members, as well as the IBRD and the IFC, with advice and technical support to improve the economic environment and financial investment projects.

- **The International Finance Corporation (IFC)**

The IFC's mission is to promote the development of private investment in developing countries and to foster an environment conducive to economic growth. IFC support mainly benefits the financial sector and infrastructure projects.

[36] These are near-zero interest rate loans (around 0.5%) over 35 to 40 years, representing a donation equivalent to around 85% of the loan amount.

2.2.1.1.3 The International Monetary Fund (IMF)

Like the World Bank, the IMF was born out of the Bretton Woods Monetary and Financial Conference. Its role has changed radically over the last thirty years. It was originally created to regulate the international monetary system with a fixed exchange rate, and to put an end to frequent devaluations by temporarily making its power available to member states with balance-of-payments difficulties. The end of the fixed exchange rate in 1971 meant the disappearance of the Fund's leading role. Since 1973, with the official flexibility of the exchange rate, it has redefined its mission and become an instrument of financial regulation. It lends to countries experiencing temporary difficulties in financing their balance of payments deficits. In return, they must implement strict policies to achieve balance. Today, it also helps developing countries stimulate growth and reduce poverty.

Since the late 1980s, the IMF has been actively involved in eradicating world poverty, providing financial assistance through its concessional PRGF (Poverty Reduction and Growth Fund) lending facility, as well as financial assistance under the HIPC (Highly Indebted Poor Countries) initiative. Since 1962, the IMF has also provided emergency financial assistance with rapid disbursement to countries affected by natural disasters or conflict. Almost all aid granted by the World Bank and IMF is in the form of loans, and is therefore repayable.

2.2.1.2 The European Commission[37]

Aid from the European Commission[38] (EC), now the European Union (EU), has mainly benefited African countries (ex-colonies) since their independence. The Commission's funding is primarily aimed at promoting economic infrastructure, energy, basic social services, agricultural production, technical cooperation and much more.

[37] https://ec.europa.eu/info/index_fr

[38] European development cooperation policy was born with the European Community in 1957. During the Treaty of Rome negotiations, France and Belgium acquired economic community with the system of linking the then colonies, known as "Overseas Countries and Territories" (OCTs) through the European Development Fund (EDF), created on January 1, 1958 to foster their economic and social development. With the independence of the colonies, a policy of coalition gave way to cooperation for development through the signing of the Yaoundé (Cameroon) agreements. The United Kingdom's accession to the European Community in 1973 led to expansion into the Commonwealth of Nations, excluding India, to form the African, Caribbean and Pacific (ACP) grouping, including the "ACP-EEC" partnership (known today as "ACP-EU") through successive conventions signed in Lomé (Togo) (Lomé I in 1975, Lomé II in 1979, Lomé III in 1984, Lomé IV in 1990). In 2000, the various Lomé Conventions were replaced by the Cotonou Agreement (Benin). The end of the Cold War led to a geographical realignment of cooperation in Europe between the countries of Central and Eastern Europe and the newly independent states emerging from the former USSR. From 1990 onwards, Asia and Latin America also became the focus of European development cooperation policy.

The European Commission also participates in the HIPC initiative, promoting democracy and the rule of law, and providing emergency food aid. Funds for the Commission come from EU member states. Initially intended primarily for ACP (African, Caribbean and Pacific) countries, European aid has gradually been extended to other developing countries. As a result, the ACP region only benefited from European aid in 1996-1998, at a rate of 29%.

2.2.1.3 Regional Development Banks[39]

Regional development banks are regional institutions built like the Bretton Woods institutions to better coordinate, monitor and finance development activities at regional level. They include: the African Development Bank (ADB). Based in Abidjan, Côte d'Ivoire, it lends to the whole of Africa (including North Africa). The Asian Development Bank, headquartered in Manila (Philippines). This bank serves the countries of South Asia, East Asia and the Pacific. The European Bank for Reconstruction and Development (EBRD), based in London (UK), serving countries in Europe and Central Asia. The European Development Fund (EDF), based in Brussels (Belgium), serving the countries of Africa, the Caribbean and the Pacific. And finally, the Inter-American Development Bank, headquartered in Washington (USA), is the principal development bank of the Americas. Their role is similar to that of the World Bank, but this time on a smaller (regional) scale.

In Africa, in addition to the AfDB (African Development Bank), which is a regional institution, there are also sub-regional institutions such as the Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO), and the Banque des Etats de l'Afrique Centrale (BEAC).

[39] https://www.lafinancepourtous.com/decryptages/marches-financiers/acteurs-de-la-finance/institutions-financieres-internationales/banques-de-developpement-regionales/

Table 5.1: Geographical distribution of ODA from multilateral organizations worldwide from 2015 – 2016

	SSA	ASC	Other countries in Asia and Oceania	North Africa and Middle East	Europe	Latin America and the Caribbean
European Union	28%	10%	3%	18%	32%	8%
International financial institutions (WB, IMF, etc.)	49%	33%	9%	0%	1%	8%
Global Funds	64%	18%	9%	1%	2%	5%
United Nations agencies	43%	16%	7%	26%	3%	5%
Other multilateral agencies	36%	11%	4%	37%	5%	7%
France (bilateral and multilateral aid)	39%	5%	13%	21%	3%	20%

Source: OECD

In contrast to the Bretton Woods institutions and regional development banks, the European Commission provides more aid in the form of grants. The EC is also the world's largest multilateral donor, as shown in figure 2.3 below. Its contribution represents around 34% of multilateral aid transferred between 2000 and 2004 (around 9% of total official development assistance).

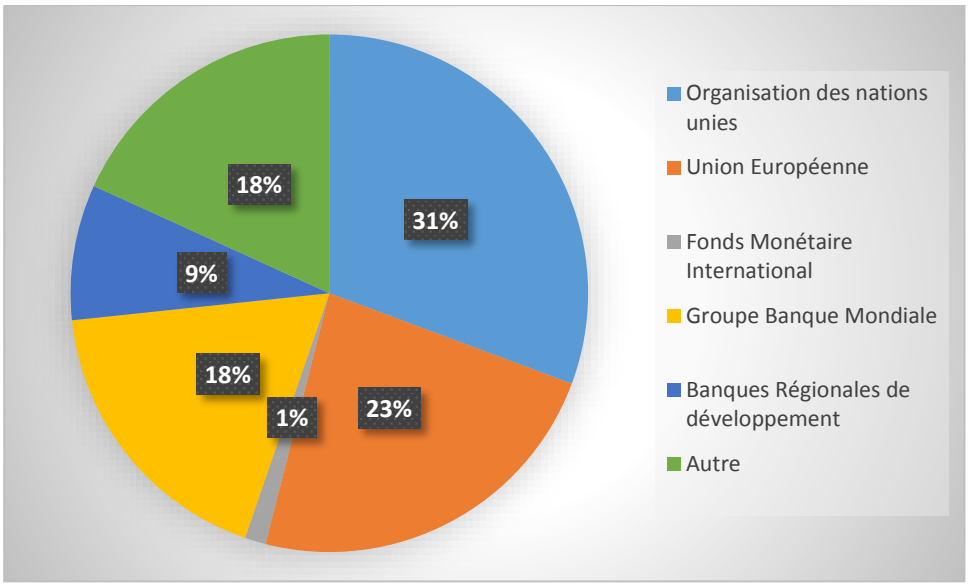

Figure2.3: Breakdown of gross payments to multilateral organizations in DAC countries, by type of organization

Source: Author's construction.

2.2.2 Bilateral donors

These are mainly industrialized countries. They provide two types of international aid: subsidized loans and grants. Bilateral aid also takes the form of debt cancellation and emergency humanitarian aid. These aids are often external to the program and are linked. The main donor countries are: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

Today, almost all developed countries contribute to financing the international aid targets set by the United Nations. They participate in the capital funding of international organizations (World Bank, IMF, EDF, UN, Regional Development Banks, and many others), and also provide loans and grants under bilateral agreements. As a rule, countries finance bilateral aid programs and make their loans and grants via a specialized[40] aid agency.

The United States is the largest donor country in absolute terms, with total aid of $35.3 billion in 2017, ahead of Germany ($24.7 billion), the UK ($17.9 billion), Japan ($11.5 billion), and France in fifth place with $11.4 billion in official development assistance (OECD, 2018). In

[40] Examples include USAID (United States Agency for International Development), the specialized bilateral aid agency for the United States, CIDA (Canadian International Development Agency) for Canada, AFD (Agence Française de Développement) for France, DANIDA (Danish International Development Aid) for Denmark, AusAID (Australian Agency for International Development) for Australia, and many more.

relative terms, however, the United States is only the 22nd largest donor country (with a rate of 0.18% of its GNI). This puts it far behind the average for DAC countries (0.4%), and the UN target of 0.7% (France is at 0.2%) (OECD, 2018).

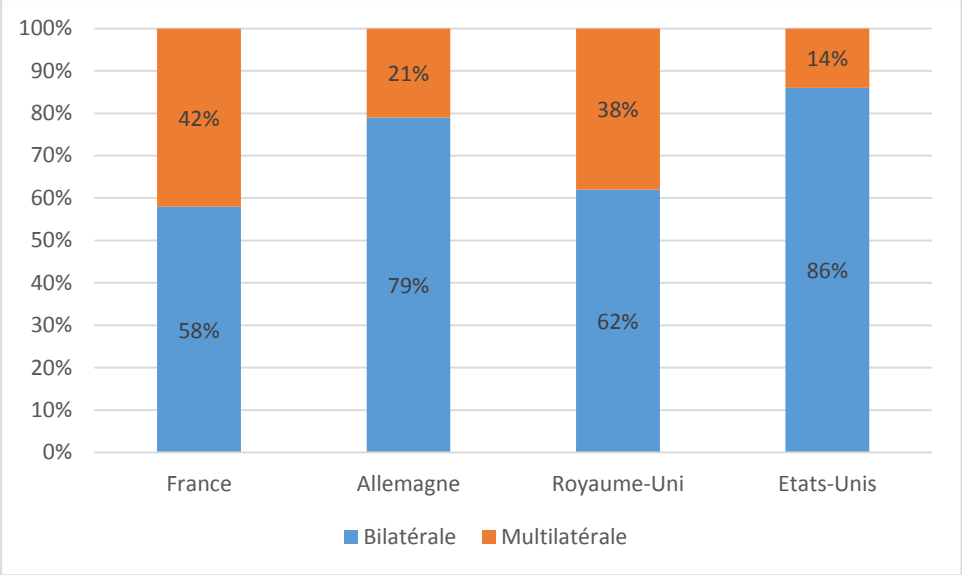

Figure 2. 4: Bilateral/multilateral aid breakdown

Source: Author's construction based on OECD data.

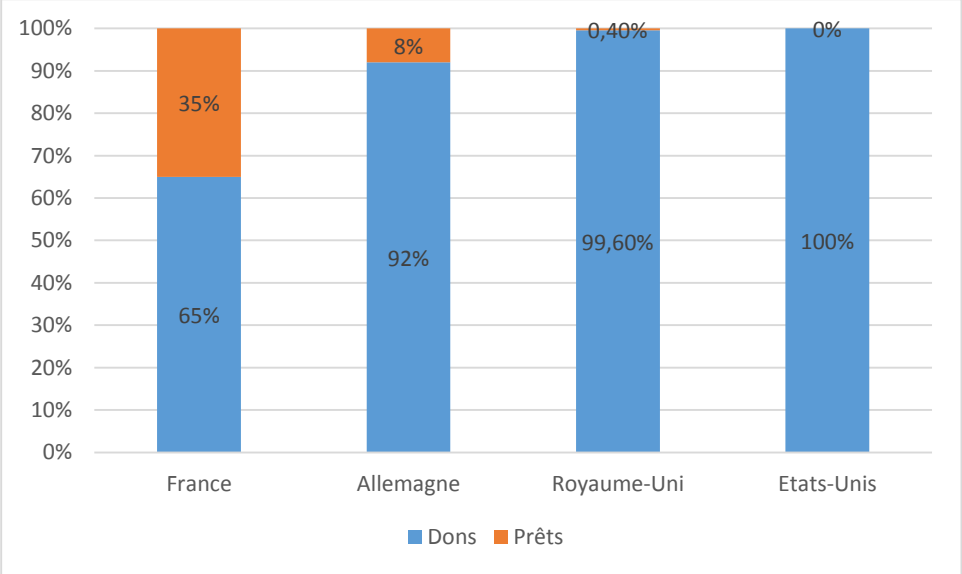

Figure 2. 5: Share of loans in bilateral aid

Source: Author's construction based on OECD data

In addition, the geographical distribution of ODA from donors to recipients can be illustrated as follows:

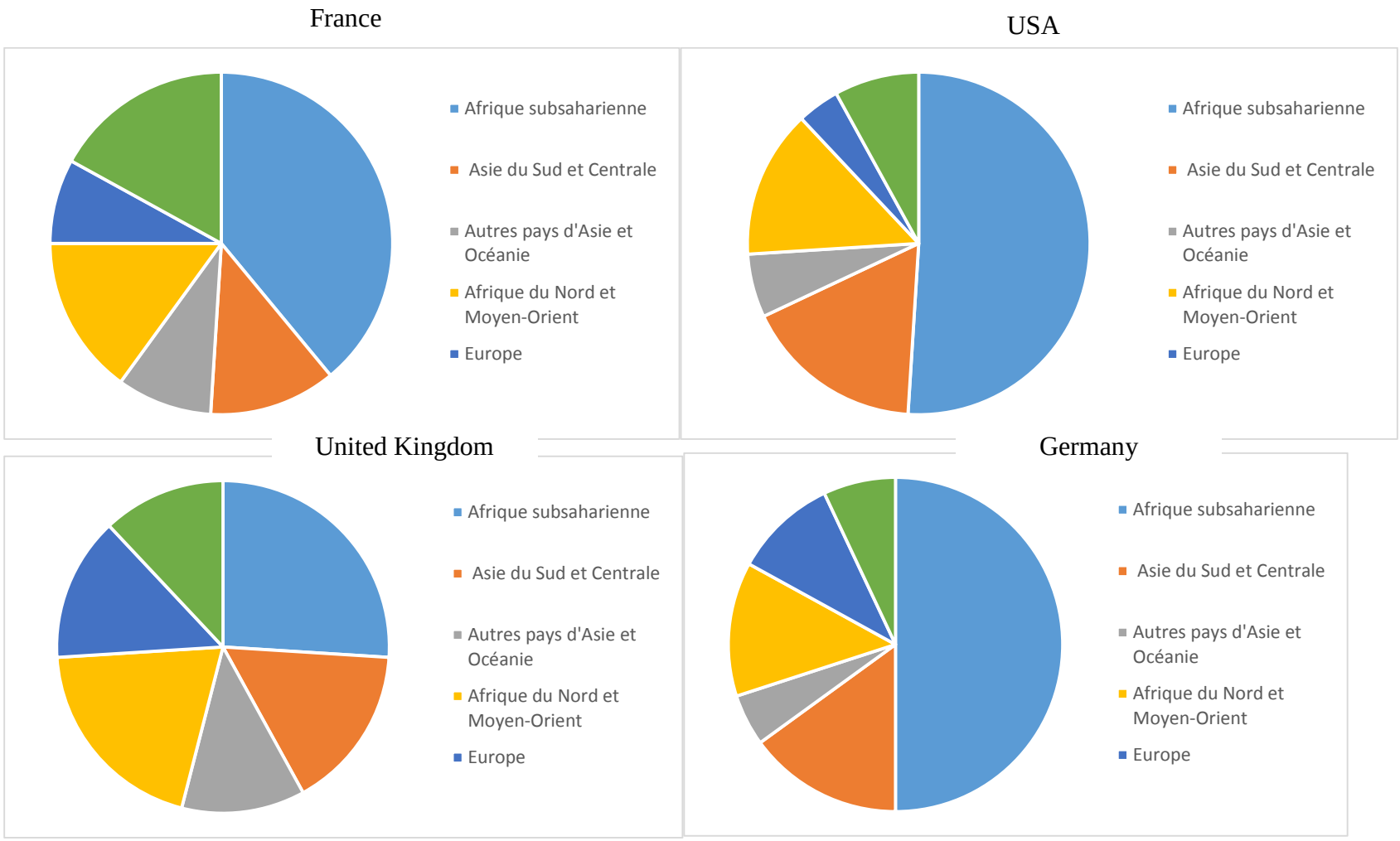

Figure 2. 6: Geographical breakdown of official development assistance
Source: Author construction.

Bilateral aid can also be tied or untied. It is said to be: Tied insofar as the donor country imposes conditions on the recipient country to purchase goods or provide services in return. The motivations for this type of tied aid are essentially twofold: economic and political. From an economic point of view, the donor requires the recipient to spend all or part of the aid received to purchase goods and services. In this case, the money received is spent in the donor country and thus serves to promote the donor's exports. Politically, tied aid is used to create or protect geopolitical, strategic, historical or cultural interests (Jepma Catrinus, 1991; OECD, 2006a). Aid is also considered untied when the donor imposes no conditions on the recipient's purchase or return of the service. According to the OECD (2006b), only 41.7% of official development assistance is untied.

2.2.3 Bilateral versus multilateral aid in CEMAC

Bilateral and multilateral aid are distinguished according to the number of partners involved. The evolution of these different forms of aid is shown in figure 2.7 below. Bilateral aid is provided by one country to another. In this case, we speak of tied or untied bilateral aid. When the aid provided by the donor country is unconditional in terms of use in return, it is said to be untied. This is also known as disinterested aid. Bilateral aid, on the other hand, is bound if the donor country is obliged to purchase certain goods and/or services on condition that it provides aid in return. Over the period 1985-2019, bilateral aid accounted for more than USD 8,000 million of total aid.

Multilateral aid is provided by a group of countries or, in most cases, by an international or intergovernmental organization. This form of aid not only supports individual countries, but also makes it possible to manage development projects on a national or regional scale. For the CEMAC countries as a whole, this form of aid accounts for over USD 16,000 million of total aid.

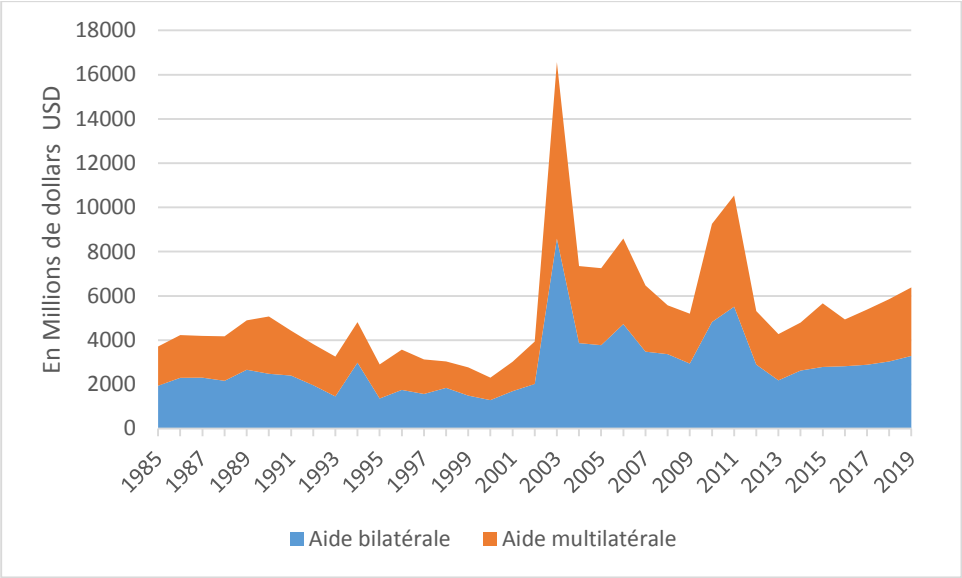

Figure 2. 7: Trends in bilateral/multilateral aid in CEMAC

Source: Author's construction, based on OECD data.

2.2.4 Other forms of official development assistance[41]

Whatever the type of aid, it can take the following form:

- **Technical assistance:** This takes the form of both autonomous technical cooperation and technical cooperation linked to various investment projects. Autonomous technical cooperation is presented as the provision of resources to ensure the transfer of technical and administrative skills and knowledge, in order to strengthen national capacities and expand development activities not linked to the implementation of the investment project. Investment projects are presented as cash and in-kind financing of equipment or specific investment projects. Technical cooperation linked to investment projects is also known as financial assistance;
- **Program aid/budget support or balance-of-payments support:** This corresponds to assistance that is part of broader macroeconomic development objectives and/or is provided with the aim of improving the recipient country's balance of payments and foreign currency supply. This category includes in-kind aid for non-food items, donations and financial loans to pay for these inputs. Program aid also includes resources corresponding to the cancellation of public debt;
- **Food aid:** This takes the form of food supplies to feed people for development purposes, including donations and loans for food purchases. Costs such as transport, storage and

[41] https://www.energiejeune.fr/page/cest-quoi/les-4-types-daides

distribution, as well as related items supplied by donors such as animal feed and agricultural inputs for food crops when these are part of the food program, are included under this heading;

- **Emergency assistance and relief:** This refers to the provision of resources to bring immediate relief to situations of distress and improve the well-being of populations affected by disasters. Food aid for humanitarian and emergency purposes is included in this section. Emergency aid and relief are generally not linked to the country's development efforts, and are not intended to strengthen the country's capacity for action. Consequently, they are not strictly speaking development cooperation. Indeed, the concept of development aid has evolved: debt cancellation and aid for trade are considered recent forms of official development assistance. Debates on the effectiveness of ODA remain topical. The effectiveness of ODA is assessed in relation to its objectives.

Section II: The foundations of ODA effectiveness

In this section on the foundations of ODA effectiveness, we begin by examining economic theories of ODA allocation based on static theories of justice and aid effectiveness. We will show that aid is a policy aimed at correcting the inequity of endowed resources between economies. Aid can also generate Pareto improvements through the existence of a global public good. Secondly, we will analyze the theory of aid effectiveness. We will show that by financing investments in poor countries, official development assistance can stimulate economic growth and thus reduce poverty worldwide.

2.3 Economic theories of ODA allocation

If we look to economic theory to justify international aid, we would consider the economic theories of justice: Rawls (1971); Sen (1999); Fleuraey (1996); Roemer (1996). Unfortunately, the criteria of justice are problematic and lead to questionable redistributive policies. Economists prefer to sidestep the problem by invoking the altruism of the better-off and the improvement of happiness for all. Aid would then be a policy that generates improvements in the Pareto sense.

2.3.1 Altruism, the need for justice and official development assistance

Altruism and the need for justice are among the main characteristics of development aid institutions, albeit to differing degrees.

2.3.1.1 Altruism and official development assistance

It could be said that if there's an interest in helping poor countries, it's the "rich" countries that are altruistic. There are many ways to formalize altruism. In simple terms, we can consider that above a certain level of wealth, additional consumption becomes a nuisance when it is detrimental to others.

Suppose there are two countries A and B (for example, representing the south and the north), their indifference curves in the Edgeworth box are illustrated using figure 2.8 below:

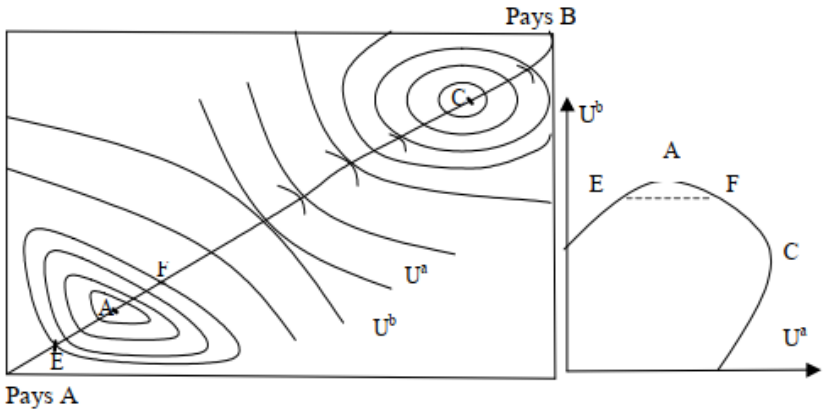

Figure 2. 8: Altruism in the allocation of wealth between rich and poor countries

Source: Inspired by the work of Paulin et al. (2018)

Country A's utility level generally increases up to point C when it reaches its maximum. After this point, any additional consumption moves it to a lower utility level. The same applies to country B when altruism-related saturation is reached at point A. The tangent points of the indifference curve to the north-east of C and south-west of A respect the equality of MSDs on the contract curve, but are not Pareto optimal. Only the points between A and C are Pareto optima. This scenario is illustrated on the right-hand side of the utility possibilities curve. Country B has maximum utility in A, and the same utility in E as in F. In E, it consumes more goods than in F, but with altruism its utility remains unchanged, as it is identical to that of F.

This simple framework shows that development aid can be justified by the principle of Paretian efficiency. If the international allocation of resources is in E, then a reallocation change from E to F (shifting resources from country B to country A) is an improvement in the Pareto sense. Country A's utility increases, while country B's utility remains unchanged. Under such conditions, only that part of the contract curve (AC) and/or CPU is considered optimal. International aid can achieve these objectives.

This is the logic of international aid based on altruism and the Pareto criterion. Extreme poverty (North-East in C and South-West in A) can certainly explain inter-state altruism. Rich countries' commitment to devote a fraction of their revenues (0.7% of GDP) to aiding poor countries can thus be explained by altruism (Paulin et al., 2018). Another justification for international aid may lie in the need for justice.

2.3.1.2 The need for justice and official development assistance

If we revisit graph 2.9 below, improvements in the Pareto sense are possible at point E. A policy of international aid can be demonstrated. But perhaps the initial state is at point A, i.e. a Pareto optimum. As Sen (1970) puts it, "an economy can be a Pareto optimum and still be purely inclusive". In this case, criteria other than Pareto's must be taken into account to justify international aid policy.

Figure 2.9 below summarizes the distribution choices arrived at by different justice criteria.

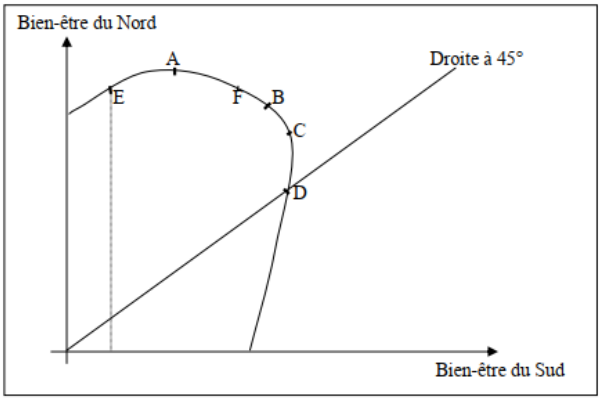

Figure 2. 9: The need for justice in the allocation of public development aid

Source: Inspired by the work of Paulin et al. (2018)

The Pareto criterion will put us in a state between A and C. Utilitarian norms in state B. Equality norm at 45° to the right in D. The Bergson-Samuelson criterion has a state between A and C. Finally, Rawls' criterion (1971) leads us to C.

Egalitarianism doesn't work (point D is not a Pareto optimum). The Bergson-Samuelson criterion gives us nothing compared to the Pareto criterion. The Pareto criterion does not allow us to choose between efficiency scores: it is a criterion of efficiency, not of justice. Only Rawls' criterion (1971) does not seem to be strongly criticized, but we know that it poses the problem of costly choices.

In this case, if the initial state is E, there may be a political consensus to move to point F, since this is an improvement in the Pareto sense. All scores between A and F from point E onwards are improvements in the Pareto sense. But the initial state at E assumes that there is an inefficiency in the initial distribution (due to altruism, for example). In fact, it's possible that the initial state is at point A, i.e. completely unfair like point E, and is Pareto optimal. It is therefore hard to see how a consensus can be reached on how to proceed with redistributive policy, i.e. wealth transfer policy or international aid. This is because it is difficult to choose a criterion; each has its advantages and disadvantages.

Faced with this difficulty, economists have grasped the problem. Since the distribution of existing wealth is a difficult question, they return to the basic criterion of efficiency. International aid can lead to greater well-being for all (Pareto optimal). It is therefore an efficient policy, and in this sense it is justified.

2.3.2 The efficiency of official development assistance

From an efficiency point of view, if we look in economic theory for what can justify international aid, then we are led to consider the existence of global public goods (peace, health, environment), certain global challenges (migration, poverty), and inter-state externalities. In this context, international aid is a policy implemented to improve the well-being of all: this is what we call the Pareto optimal policy, and therefore the efficient one.

2.3.2.1 Global public goods and the efficiency of official development assistance

Some of the justifications for international aid are based on the need to preserve global public goods. Peace is perhaps the most important public good. It is clear that the neighboring states of countries in civil war bear some of the costs of these conflicts. This justifies international public action to stop them. Indeed, armed conflict is often seen as a form of debt collection. The government controls the rents created by the state, and an insurgent movement tries to seize control. In such a case, aid increases the state's various resources. With more resources, the government can invest in its defense capabilities. It increases military spending: si vis pacem parabellum. This increases the cost to insurgents of taking control of the state. In this way, aid can deter rebellion. Moreover, with aid resources, the government can increase social spending; the result was a reduction in the tension of the uprising and thus a reduction in the incentive to revolt (Collier and Hoeffler, 2004). Collier and Hoeffler (2004) estimate that the benefits of a secure situation alone account for 40% of aid costs.

The second most important international public good is the environment. The environmental challenge is a major issue of our time. Greenhouse gas emissions are gradually destroying the ozone layer, which is essential for life on earth. Global warming and the subsequent melting of polar glaciers are increasing the risk of natural disasters (tidal waves, floods, droughts, etc.) (World Bank and United Nations, 2006). Prolonged drought makes agricultural activities difficult. Environmental problems create enormous costs that no country can solve alone. Only joint international action can put an end to these ills. In this context, the financing of ecological or environmental improvement projects by international aid is an effective policy (Dalgaard, 2005).

2.3.2.2 Inter-state externalities and the efficiency of official development assistance

There has been much discussion in recent years about inter-state externalities. Industrialized countries are abusing a number of global public goods that can deplete and produce too much waste harmful to humanity (water pollution, greenhouse gases, noise, etc.). Some authors argue that inter-state externalities are important explanations for stagnation in developing countries (Gunning, 2004). It is therefore necessary to optimize the introduction of a tax to compensate for these negative externalities. Thus, international aid can be seen as a tax system in which poor countries pay a negative tax (because they don't pollute); and industrialized countries that create pollution pay taxes on their income (Deeatripont and Seabright, 2006).

Indeed, international aid is more than a simple gesture of generosity. In addition to the altruism of the rich, the need for justice, global public goods and inter-state externalities require the intervention of an international public force. Thus, we can think of today's world as an entity in which the United Nations plays the role of public power and states are treated as individuals. Following the example of redistributive policy within a single country, the public authority that is the UN taxes the incomes of the richest (hence the target of 0.7% of the gross national product (GNP) of developed countries) to subsidize the consumption of the poorest and to finance the production of public goods (peace, research, environment) (Dalgaard, 2005). Development aid policy is, in turn, an efficient policy. It is therefore about improving the well-being of everyone (in the Pareto sense). Another way of achieving this objective (i.e. improving the well-being of all) is to push back the frontier of global productive possibilities by promoting economic growth in poor countries.

Economic theory tells us that the marginal productivity of capital decreases. The richer the person, the less productive the capital. On this basis, capital will be more efficient in developing

countries (such as China and India today). So, redirecting a portion of resources from the North to the South would improve perception in the Pareto sense. What's more, official development assistance capitalized in poor countries is an efficient policy because it increases the overall return.

2.4 Official development assistance, economic growth and the fight against poverty

2.4.1 Official development assistance and economic growth

The theoretical relationship between ODA and economic growth is closely associated with modern post-war economic development theory. Economic development theory believes and advocates that the right amount and mix of savings, investment and official development assistance will enable developing countries to follow a growth trajectory similar to that of other economies. Western economies have followed to convert their agrarian economies into modern ones (Todaro and Smith, 2015). In addition to the historical experience of advanced economies, the success of the "Marshal Aid" program in Europe is seen as a key lesson for "backward continents" such as Africa, Asia and the Latin Americas. At the time, development was designed to resemble rapid economic growth, and foreign aid was seen as a key driver of growth in developing countries. Linear growth models and the extension of the two-gap model are the main models that strongly support the important role of development aid in stimulating growth in developing countries (Todaro and Smith, 2015). This subsection provides a brief overview of the main economic arguments that these theoretical models have put forward in favor of ODA.

2.4.1.1 The linear growth model

2.4.1.1.1 Rostow's stages of growth

Walt R. Rostow developed the stages of development growth model to describe the paths a country can take from an underdeveloped to a modern economy. Simply put, Rostow argues that every country must pass through five stages to achieve economic development. These five distinct stages that each country must pass through are: traditional society, a prerequisite, take-off, take-off to race, to maturity and to high mass consumption (Todaro and Smith, 2015). All developed countries are past the take-off stage for sustainable growth, while developing countries are piling on the traditional social scene or in the pre-take-off phase (Tefera and Nicholas, 2020). It has been suggested that developing countries need to follow certain rules in

order to move into the entrepreneurial stage and achieve self-sustaining growth (Tefera and Nicholas, 2020).

The importance of official development assistance in Rostow's growth model is highlighted when a set of rules is deemed necessary for development to "take off". According to Rostow, one of the essential strategies to be able to take off is the mobilization of domestic and foreign savings to enable investment and promote economic growth (Todaro and Smith, 2015). However, developing countries have encountered a significant "savings gap" in generating the investments needed to initiate "lift-off" and sustainable growth. Rostow advocates foreign aid flows to developing countries to bridge the "savings gap" or "financing gap" between the investments required (using ICOR 3 to 3.5 based on the Harrod-Domar model) to get off the ground and be realistic (Easterly, 1997). This implies that foreign aid is seen as an important resource for generating investment and accelerating growth in developing countries. Indeed, this is closely related to the Harrod-Domar growth model, which explains the economic mechanisms by which increased investment increases growth (Todaro and Smith, 2015).

2.4.1.1.2 The Harrod-Domar model of economic growth

The Harrod-Domar growth model and its extension is a two-gap model commonly used to understand official development assistance and growth, as well as other policy issues facing developing countries (Todaro and Smith, 2015; Easterly, 1997). This model explains the economic mechanisms by which more investment leads to more growth. Economic gro (2.1) determined by savings and capital reserves. As Todaro and Smith (2015) show, a simple economic growth model can be constructed as follows:

$$S = sY \tag{2.1}$$

Equation (2.1) above implies that net saving (S) is a proportion (s) of national income (Y). S is the saving rate. New investment is then given as:

$$\mathrm{I} = \Delta K \tag{2.2}$$

Since the capital stock (K) is directly proportional to GDP (Y), the unit of capital required to produce one unit of output is represented by the capital-output ratio, k:

$$\frac{K}{Y} = k \quad \text{or} \quad \frac{\Delta K}{\Delta Y} = k \quad \text{or} \quad \Delta K = k\Delta Y \tag{2.3}$$

In principle, net savings (S) should be equal to net investment (I), which can be written as:

$$S = I$$

However, from equations 2.1 to 2.3, we know that:

$$I = \Delta K = k\Delta Y \tag{2.5}$$

This implies that equation 2.4, which equates savings and investment, can be rewritten as:

$$S = sY = k\Delta Y = \Delta K = I \tag{2.6}$$

Or simply as:

$$sY = k\Delta Y \tag{2.7}$$

Now, dividing the two sides of equation 3.7 first by Y then by k, we obtain:

$$\frac{\Delta Y}{Y} = \frac{s}{k} \tag{2.8}$$

Where $\Delta Y / Y$ refers to the rate of change or growth in GDP.

Equation (2.8) represents a simplified version of the Harrod-Domar theory of economic growth. This equation shows that the GDP growth rate $\Delta Y / Y$ is jointly determined by the national savings rate (s) and the capital-output ratio (k). According to the model, the GDP growth rate is positively related to the savings rate (i.e. the capacity to save and invest) and negatively related to the capital/production ratio.

2.4.1.2 Effectiveness/ineffectiveness of aid for growth

Without a doubt, the link between aid and growth in developing countries is one of the most empirically studied areas in economics, using various econometric panel techniques. Despite the availability of several very thorough empirical studies (Doucouliagos and Paldam, 2010; Arndt et al., 2015; Tefera and Nicholas, 2020, etc.) on this link, the evidence is still mixed and controversial. For the sake of brevity, the discussion is organized along two lines of debate on the aid-growth nexus namely aid effectiveness and aid ineffectiveness.

2.4.1.2.1 Aid effectiveness on economic growth

The general belief among fund donors is that the impact of aid on growth is positive, bolstering the arguments of aid advocates and leading to an increase in aid flows to developing countries over recent decades (Doucouliagos and Paldam, 2010). Arndt et al (2015), for example, have demonstrated that official development assistance has played an important role in stimulating

economic growth in aid-receiving countries over the past four decades. Essentially, these positive effects of aid on growth are already evident among aid recipients in developing countries in general (Clemens et al., 2012; Lof et al., 2015; Magesan, 2016; Galiani et al., 2017), in Africa (Jones, 2013; Tait et al., 2015; Gillander, 2016; Reidy, 2016), and transition economies in particular (Askarov and Doucouliasgos, 2015).

Surprisingly, these empirical studies adopted different estimation approaches such as the inclusion of instrumental variables (Arndt et al., 2015; Reidy, 2016; Galiani et al., 2017), dynamic panel estimations such as the generalized method of moments (GMM) (Lof et al., 2015; Gillanders, 2016), a panel cointegration estimation technique (Juselius et al., 2013) as well as lagged values (Clemens et al., 2012) to capture the aid that is the growth link. Using the panel cointegration estimation procedure, recent studies have found a positive effect of aid on growth in West African countries (Jones, 2013) and among 36 SSA countries in the years 1960 to 2007 (Juselius et al., 2013). Clemens et al. (2012) find the average positive effect of aid on growth mainly for "early impact aid", using lagged first and difference values in the regression model.

With regard to the transmission mechanism, most studies show that aid positively affects growth by increasing domestic investment in aid-recipient countries (Clemens et al., 2012; Lof et al., 2015; Alemu and Lee, 2015; Galiani et al., 2017). In addition to investment, several studies also show that aid positively affects growth by increasing human capital (Arndt et al., 2015), consumption (Juselius et al., 2013), and by "generating structural change in household demand for services" (Magesan, 2016).

On the other hand, a series of studies have also investigated whether aid behaves equally in all recipient countries. Indeed, a vast literature has shown that aid behaves differently across countries when aid heterogeneity is addressed by dividing the sample into different regions/sub-regions, income groups as well as resource preferences (Ekanayake and Chatrna, 2010; Alemu and Lee, 2015; Eregha and Oziege, 2016; Rahnama et al., 2017). Ekanayake and Chatrna (2010) studied the impact of aid on growth for a group of 83 developing countries between 1980-2007 by region (Africa, Asia, Latin America and the Caribbean) and income levels (low, middle, high and upper). Aid had only a positive effect on growth in Africa and in low- and upper-middle-income countries; in the other groups, however, aid had a negative effect.

2.4.1.2.2 Ineffectiveness of aid on economic growth

In general, contrary to the proponents of aid, some studies in the literature argue that ODA does not promote economic growth in developing countries. Essentially, the lack of evidence on the effectiveness of aid in stimulating growth means that either aid is detrimental to growth (i.e. the negative impact of aid), or that aid has little or no effect on growth.

Evidence from several studies tends to suggest that aid harms rather than promotes growth in developing countries. The most widely cited study to stimulate discussion of the ineffectiveness of aid is Boone (1996). Using panel data for 96 countries between 1971 and 1990, Boone (1996) shows that aid does not stimulate investment and growth in developing countries. He applied an instrumental variable approach (such as population size and a dummy for political affiliations with Development Assistance Committee (DAC) donors), and experimentally demonstrated no effect of aid on investment, which is the main driver of growth. Contrary to the claims of aid advocates, Boone (1996) finds that aid harms investment because a greater proportion of aid is devoted to consumption.

In addition, recent work has also demonstrated a negative relationship between aid and growth (Arawomo et al., 2015; Adedokun and Folawewo, 2017). Arawomo et al. (2015) used GMM techniques to determine whether aid complements savings as a driver of growth in the West African Monetary Zone (WAMZ) between 1980 and 2012. The results of their work reveal a negative and significant effect of aid on growth, while savings have a positive effect on growth in the WAMZ. The study concludes that aid does not complement domestic savings in stimulating growth in WAMZ countries. Using the same estimation method, Adedokun and Folawewo (2017) found a negative but insignificant relationship between aid and growth for the full sample in Sub-Saharan Africa (SSA) from 1996 to 2012.

In addition to the above evidence from the full sample similar negative effects of aid on growth, have also been reported based on analysis of panel data disaggregated by income groups (Rahnama et al., 2017; Alemu and Lee, 2015). Both studies applied the GMM estimation technique and found a negative effect of aid on growth in low-income developing countries (Rahnama et al., 2017) and low-middle-income countries in Africa (Alemu and Lee, 2015). According to Rahnama et al. (2017), official development assistance is detrimental to growth in the early stages of development, and it is necessary to provide some "traction" before a country can make good use of it. The study concludes that the main factors hindering aid effectiveness are corruption and inefficient institutions in aid-recipient countries.

Interestingly, several empirical studies have found no effect of official development assistance on economic growth (Rajan and Subramanian, 2008; Dreher and Langlotz, 2017; Phiri, 2017). The most cited study on this issue is by Rajan and Subramanian (2008), who investigated the link between aid and growth using cross-sectional and panel data. These studies included more instrumental variables such as population size dummies for language, colonial relations and several interaction variables in their regression model. They found no evidence not only of the impact of aid (whether positive or negative) on growth, but also that "aid works better in a better political or geographical environment". Indeed, the study suggests reconsidering the aid mechanism if aid is to support growth in recipient countries.

In addition to previous studies, the lack of effect of aid on growth has also been reported in many recent studies (Dreher and Langlotz, 2017; Phiri, 2017). Using donor disaggregation as a tool that can be excluded from panel data for 96 developing countries from 1974 to 2009, Dreher and Langlotz (2017) reported no significant and positive effect of aid not only on growth for the whole sample but also on the different components of GDP (savings investment and consumption). On the other hand, Phiri (2017) applied the fixed-effect instrumental variable approach and found no significant negative effect of aid on growth in SSA[42].

2.4.2 Dynamics of economic growth from official development assistance

Aid can be financial, food, economic, technical and military, depending on its objectives. These initiatives are deliberate to alleviate poverty, balance budget deficits and help them achieve macroeconomic stability (Sethi et al., 2019). Many works in the literature disagree on whether or not aid leads to economic growth. The most important is the mechanism by which this result is achieved, i.e. the impact of development aid is conditioned by the political and institutional factors of any country. Corruption, political stability, the level of good governance and the maintenance of law and order are just some of the many institutional factors that affect a country's growth. Aid, if not complemented by an appropriate institutional framework in the economy, will have a negligible impact on the business cycle (Tang and Bundhoo, 2017).

There are several mechanisms by which aid can contribute to economic growth: firstly, aid increases investment in human and physical capital. Secondly, aid increases the likelihood of importing capital goods or technology. Thirdly, aid complements scarce domestic resources

[42] The results show that aid is not effective in supporting growth in the Sub-Saharan African countries sampled. He concluded that aid ineffectiveness could indicate that aid flows to these countries were either poorly allocated or insufficiently utilized.

and is a source of foreign exchange earnings. Fourthly, aid is linked to technology transfer to increase capital productivity and promote local technical change. Fifthly and finally, aid also provides other resources needed for development, such as management skills, organizational capacity, research ideas and market access (Morrissey, 2001). The major contribution of ODA to less developed economies can be assessed by its role in filling two main gaps; the savings-investment gap, and the difference between exports and imports is the result of Chenery and Alan's (1966) two-gap model.

Foreign capital inflows also help overcome the disadvantages faced by a developing economy (lack of adequate capital levels), as they bring sufficient physical and financial capital, technical know-how, investment funds, skilled personnel, market information, organizational experience, production techniques, product innovations and foreign currency resources (Sahoo and Sethi, 2017). However, proponents of anti-aid argue that foreign capital acts as a substitute for domestic resources and therefore distorts income distribution. Moreover, it is also argued that official development assistance in many initially capital-poor countries leads to the formation of biased, inefficient and corrupt governments (Griffin and Enos, 1970; Bauer, 1971; Weisskoff, 1972).

Section III: Methodological approach and analysis of results

2.5 Methodological approach

This sub-section is devoted to the model to be used in this study and the estimation method.

2.5.1 Model and method

Here we examine the model specifications and the method to be used to analyze the impact of official development assistance on the business cycles of CEMAC countries. The specified model is estimated using the ARDL method. The model is conventionally derived from a production function in which foreign aid is introduced as an input in addition to domestic labor and capital. In the usual notation, the production function can be written as follows:

$$Y = f(ODA, ODA^2, Inf, Trade, GPOP, MM, Inv) \tag{2.9}$$

Based on the economic function presented above, we formulate the econometric model as follows:

$$Y_{it} = \beta_0 + \beta_1 ODA_{it} + \beta_2 ODA_{it}^2 + \beta_3 Inf_{it} + \beta_4 Trade_{it} + \beta_5 GPOP_{it} + \beta_6 MM_{it} + \beta_7 Inv_{it} + \varepsilon_{it} \tag{2.10}$$

Where β_0 indicates the constant term of the equation, while 1, 2, 3, 4, 5 and 6 represent the long-term elasticities. Y represents the business cycle; ODA is official development assistance (in % of GNI); INF is inflation, represented here by the consumer price index; INV is domestic investment represented by gross fixed capital formation (in % of GDP); GPOP is the population growth rate; MM is the money supply; and finally Trade represents trade openness for in-kind donations.

It should be noted that using non-stationary data to estimate a model can generate a spurious regression problem and make estimation results very unreliable (Granger and Newbold, 1974). So, in order to eliminate such a problem, we subject our data to unit root tests, notably the Dickey-Fuller Augmenter (ADF) test (1981), the Breitung test (2000), and finally the Im et al. (IPS) test (2003).

Having identified the level of stationarity of each of our variables, it is opportune for us to explore the cointegration characteristics of the series in question. The long-term cointegration interaction between the variables used is captured using the cointegration test introduced by Pesaran et al. (2001), because it has the advantage of generating reliable and unbiased results when the variables are integrated of order I(0) and I(1), and not I(2) (Narayan and Smyth, 2004). The ARDL[43] method used in this study follows the F distribution of Narayan and Narayan (2005) and the critical values proposed by Pesaran and Timmermann (2005) are used.

The ARDL method used has several advantages. It is more appropriate for testing the existence of long-term relationships in small sample sizes, and unlike the approach of Johansen and Juselius (1990), the ARDL approach makes it possible to test them between variables with different orders of integration. What's more, this approach takes into account the dynamic nature of the panel and has the advantage of simultaneously obtaining the short-term and long-term equations, and of taking into account both country heterogeneity and series dynamics, unlike the traditional panel approach. This approach introduces heterogeneity in short-term parameters, while maintaining homogeneity in long-term parameters.

[43] As a general rule, five different scenarios appear in the ARDL analysis. The first scenario is the application of the linked test with interception and trend. The second scenario is the application of the linked test with limited interception and no trend. The third case is without interception without restriction and deterministic trend. The fourth scenario is the application of deterministic intercept without restriction and linked test with limited trend. And finally, the fifth scenario is the implementation of an unrestricted intercept and a limited trend in the linked test.

The special feature of the ARDL method is that it circumvents the difficulties associated with Engel and Granger's (1987) method, which suggests that variables be cointegrated, by allowing variables of different levels of integration to be estimated.

The long-run relationship model of the ARDL method is formulated as follows:

$$\Delta Y_{it} = \beta_0 + \sum_{i=1}^{k} + \sum_{i=1}^{k} \beta_2 \Delta ODA_{t-i} + \sum_{i=1}^{k} \beta_3 ODA_{t-i}^2 + \sum_{i=1}^{k} \beta_4 \Delta Inf_{t-i} + \sum_{i=1}^{k} \beta_5 \Delta Trade_{t-i} + \sum_{i=1}^{k} \beta_6 \Delta GPOP_{t-i} + \sum_{i=1}^{k} \beta_7 \Delta MM_{t-i} + \sum_{i=1}^{k} \beta_8 \Delta Inv_{t-i} + \varepsilon_{t-i} \quad (2.11)$$

In addition to the above approach, in this study we use the Toda-Yamamoto (1995) causality technique in the time domain to explore the causal interaction between the dependent variable and the other variables in our model. Toda-Yamamoto causality tests are generally known to explore firstly whether the variable X causes the variable Y, secondly whether the variable Y causes the variable X, and thirdly whether X and Y cause each other. Toda and Yamamoto (1995) suggest a fascinating reflection in that the new procedure involves the calculation of an augmented VAR that ensures the asymptotic distribution of Wald statistics (asymptotic distribution), as the test method is robust to the integration and cointegration of system attributes.

2.5.2 Data and measurement of variables

The variables used in this work are taken from the World Bank's World Development Indicator (WDI) and World Perspectives. All our variables are expressed in annual terms. The study period runs from 1985 to 2019. The variables taken into account in this study include: Gross Domestic Product expressed in real terms (output gap to measure the business cycle), official development assistance and its square (in % of GDP), inflation, trade openness, population growth rate, money supply and investment. Each of these variables is described below.

2.5.2.1 The dependent variable

Following the work of Lucas (1977) and Kydland and Prescott (1990), we define business cycles as deviations of output from trend; and business cycle facts as the statistical properties of co-movements of output deviations from trend with deviations from trend of other aggregate time series. In the literature, this business cycle variable is captured either by the output gap (EP) or by the economic growth rate. In the first case, the output gap variable is chosen because

it represents the variable par excellence for measuring the business cycle. This variable results from the difference between actual GDP and potential GDP. The latter represents the trend portion of gross domestic product, obtained by correcting for cyclical variations in real GDP. When we examine the business cycle aspects of official development assistance, we first relax the data series using the Hodrick and Prescott (HP) filter (1997). For any series X , the HP filter extracts the real GDP component Xg and the cyclical component $X_c = X - X_g$ by minimizing the following loss function:

$$\sum_t x_t^{c^2} + \lambda \sum_t \left((x_{t+1}^g - x_t^g) - (x_t^g - x_{t-1}^g) \right)^2 \qquad (2.12)$$

Where l is a weight that reflects the relative variance of the two components. We retain the value of $\lambda = 100$, which is classic for annual data.

2.5.2.2 The variable of interest

As documented in the literature, the measure of foreign aid is the World Bank's "official development assistance" (ODA). According to the literature, this analysis primarily uses aid as a share of GNI (Collier and Dollar, 2002; Knack, 2009; Galiani et al., 2017). Aid includes grants and loans with a grant component greater than 25%. This definition excludes most IMF loans and a significant proportion of World Bank loans, which are offered to middle-income borrowers at near-market rates. Military aid is also excluded from the definition of ODA (Knack, 2009). We also included ODA2 to investigate the non-linear relationship between ODA and economic growth (Ekanayake and Chatrna, 2010; Clemens et al., 2012; Dreher and Langlotz, 2020) and to answer questions about the possible existence of a U-shaped relationship (Wamboye, 2012; Gyimah-Brempong and Racine, 2014).

2.5.2.3 Control variables

The control variables in our study are: inflation, trade openness, population growth rate, money supply and domestic investment. Table 2.2 below gives a description of the variables and data sources.

Table 2. 2: Description of study variables

Variables	Measures	Symbol	Sources
Economic cycles	Real gross domestic product (in constant dollars 2010=100)	Cycle	WDI
Official Development Assistance	Net Official Development Assistance received (as % of GNI)	ODA	WDI
Inflation	Indice des prix à la consommation	INF	WDI
Trade openness	Which is the sum of imports and exports as a fraction of GDP	Trade	WDI et Perspectives Mondes
Population growth rate	Total population (as % of GDP)	GPOP	WDI
Money supply	Money supply	MM	WDI
Domestic investment	Gross capital formation (as % of GDP)	INV	WDI et Perspectives Mondes

Source: Author's construction.

Table 2.3 below gives us the descriptive statistics of the variables with a total of 210 observations.

Table 2. 3: Descriptive statistics for study variables

Variable	Obs	Moyenne	Ecart-type	Min	Max
Cycle	210	0	10.382	-35.733	107.067
ODA	210	8.636	11.088	-.188	69.401
ODA2	210	196.945	555.286	0	4816.526
Inf	209	79.506	28.705	27.081	151.785
Trade	210	81.385	41.929	26.453	275.23
GPOP	210	2.945	.795	.26	6.017
MM	209	16.629	5.574	5.735	39.814
INV	210	18.328	17.492	2.128	115.102

Source: Author's construction, based on World Bank and World Outlook data

Figure 2.10 below gives us an overview of the degree of linearity and non-linearity of the dependent and independent variables. These graphs show us that the cycles are concentrated around the point of origin, with some points of the cycle eccentric downwards in the direction of the trend. Figure 2.10 (a) shows a slightly decreasing long-term trend. Figure 2.10 (b), on the other hand, shows that although the cycles are concentrated at the origin, with a few points further down, the trend is perfectly downward.

(a) (b)

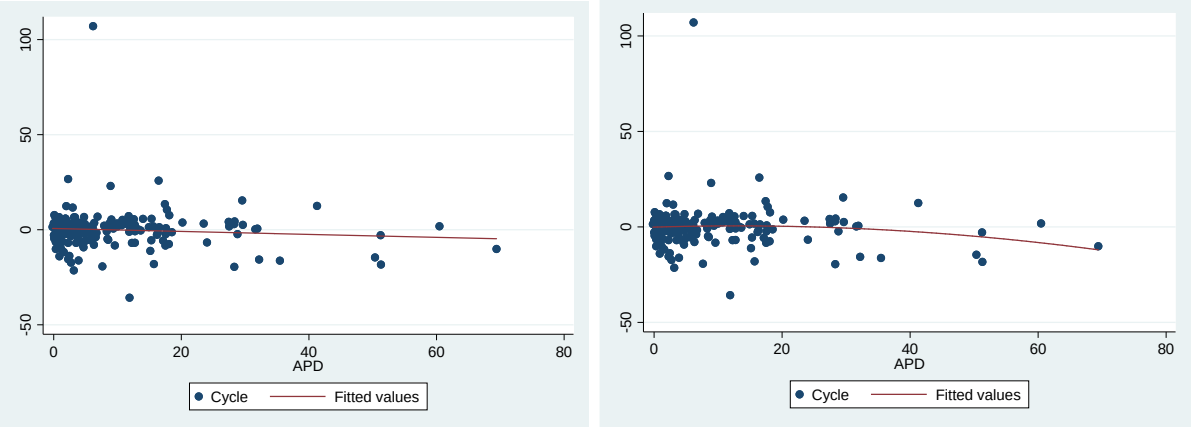

Figure 2. 10: Degree of linearity and non-linearity of the cycle as a function of ODA

Source: Author's construction, based on World Bank data

2.6 Empirical results and interpretation

This subsection is devoted to the analysis of the results obtained and their interpretation.

2.6.1 Unit root tests

Obviously, before proceeding with the estimation of the ARDL model, well start by analyzing the stationarity of the different variables used in this study. The results of our unit root tests (ADF, Breitung and IPS) reveal that our variables are stationary in level and first difference. This decision allows us to apply the Pool Mean Group/Autoregressive Distributed Lag Model (PMG/ARDL). After applying the unit root test, we can see that the variables cycles, APD, APD² and GPOP are stationary in level. On the other hand, variables such as investment, inflation, money supply and trade openness are stationary in first difference. Table A2.1 in Appendix 2 provides an overview of the results of our variable stationarity tests.

2.6.2 Determining the optimal number of lags

Before estimating the ARDL model itself, it makes sense for us to determine the optimal number of delays based on criteria such as: LR, FPE, AIC, SC and HQ respectively for the equation. The meaning of each of these acronyms is given below. From Table 2.4 below, we can say that the optimal number of delays selected is of the order of three (03).

Table 2. 4: Determining the optimal number of delays

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-5970.419	NA	8.11e+17	63.94031	64.07854	63.99632
1	-4686.206	2444.811	1.74e+12	50.88991	52.13397	51.39400
2	-4380.084	556.5849	1.31e+11	48.30037	50.65027	49.25255
3	-4117.388	455.1529*	1.58e+10*	46.17527*	49.63101*	47.57554*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's calculations, based on World Bank and World Outlook data

2.6.3 Results of the variable cointegration test

We verified the cointegration of our different variables using the Kao (1999) test. Thus, the analysis of Kao's cointegration test reveals that all the variables in the model are cointegrated, since the P-value is less than 5% (Prob = 0000 < 5%) (Table A2.2 in Appendix 2). Hence we accept the alternative hypothesis that the series are cointegrated. Thus, there is a long-term relationship between the different variables in the model.

2.6.4 ARDL model estimation results

After confirming the presence of a long-run association in the Fisher F model between the variables (Cycle, ODA, ODA^2, INF, Trade, GPOP, MM, INV), our work highlights the results of the long-run and short-run ARDL estimations in table 2.5 below. Our dependent variable is the output gap (cycle). Official development assistance is our independent variable. Our control variables include inflation, trade openness, population growth rate, money supply and domestic investment.

Table 2. 5: Estimation of the ARDL model

Variable	Coefficient	Std.er	T-Statistic	P-value.*
	Long term			
Dependante variable : CYCLE				
ODA	0.661105	0.188969	3.498482	0.0006***
ODA^2	-0.013081	0.005630	-2.323435	0.0215**
INF	0.058433	0.017694	3.302511	0.0012***
Trade	-0.048273	0.021736	-2.220840	0.0279 **
GPOP	1.735509	0.948594	1.829558	0.0693*
MM	0.044098	0.117083	0.376641	0.7070
INV	-0.098514	0.036623	-2.689965	0.0080 ***
	Short term			
Dependante variable : D(CYCLE)				
COINTEQ01	-0.977346	0.140191	-6.971515	0.0000***
D(ODA)	-1.546390	1.275496	-1.212384	0.2273
D(ODA^2)	0.029488	0.052679	0.559781	0.5765
D(INF)	-0.078128	0.130907	-0.596819	0.5515
D(Trade)	0.017335	0.042093	0.411827	0.6811
D(GPOP)	-7.976814	4.867940	-1.638643	0.1034
D(MASSE MONETAIRE)	-0.873902	0.387234	-2.256777	0.0255**
D(INV)	0.122634	0.149757	0.818890	0.4142
C	-8.604076	1.628100	-5.284734	0.0000***
Mean dependent var	-0.117078	S.D. dependent var		14.91641
S.E. of regression	8.346370	Akaike info criterion		6.291155
Sum squared resid	10240.30	Schwarz criterion		7.269952
Log likelihood	-593.2801	Hannan-Quinn criter.		6.686930
***Note: p-values and any subsequent tests do not account for model selection.**				

Note: ***, ** and * indicate the degree of significance at the 1%, 5% and 10% thresholds respectively
Source: Author's calculations, based on World Bank and World Outlook data

2.6.4.1 Econometric interpretation

The estimation of our model using the ARDL method shows us that the coefficient of the recall force (CointQ1) is negative but statistically significant. This proves that the estimated model is well specified. Furthermore, we can observe that in the short term, only the money supply variable is statistically significant. On the other hand, in the long term, variables such as official development assistance and its square, inflation, trade openness, population growth rate and investment are statistically significant.

2.6.4.2 Economic interpretation of ARDL results

From table 2.5 above, we can see that in the long term, official development assistance and its square all have positive (respectively negative) coefficients, statistically significant at the 1% and 5% thresholds respectively. This result suggests that, economically speaking, the higher the level of official development assistance in the CEMAC, the more this community will tend to grow towards its full production potential (potential GDP). This could lead to economic

progress for CEMAC countries. Specifically, when other factors are held constant, a one-percentage-point increase in ODA translates into a 0.6611-percentage-point increase in the output gap. This shows that ODA interacts positively with the output gap. Empirically, this finding corroborates the work of Loxley and Sackey (2008), Fasanya and Onakoya (2012) and Tra (2014) and disagrees with the work of Cuberes and Tsui (2011), Sheikh Ahmed (2014) and Aghoutane and Karim (2017).

Like ODA and its square, inflation shows a positive coefficient in table 2.5, statistically significant at the 1% level. This means that a one-percentage-point rise in inflation translates into an increase of 0.0584 percentage points. This shows that there is a significant relationship between inflation and the business cycle. This finding corroborates the work of Chude and Chude (2015) that ODA does influence GDP growth, and contrasts with the work of Erbaykal and Okuyan (2008), Bawa and Abdullahi (2012).

In the short term, trade openness is positive and insignificant. In the long term, however, trade openness is negative and statistically significant at the 5% threshold. This reflects the fact that trade openness has a significant impact on the business cycle. Thus, a 5% decrease in trade openness leads to a 0.048273% decrease in the output gap.

In the short term, the population growth rate is negative and insignificant. In the long term, however, the population growth rate is positive and statistically significant with the business cycle at the 10% threshold. This means that a 10% increase in the population growth rate in the CEMAC region leads to a 0.0693% increase in the output gap, which in turn increases the volatility of the cycle. This result perfectly corroborates the work of Refaei and Sameti (2015).

With regard to the money supply, in the short term this variable is negative and significant at the 5% level. In the long term, however, this variable is positive and insignificant. Note that a fall in the output gap of 0.098514 is the result of a 1% fall in investment. The investment coefficient is negative but statistically significant at the 1% level. This result contradicts the work of Sethi (2014), Aghoutane and Karim (2017) and Fashina et al. (2018). We can see from our result that there is a weak link between investment and the output gap, yet according to economic theory, investment promotes growth and development through the effects it induces, and the main motivation of companies is to increase their output.

2.6.5 Toda and Yamamoto causality test

Toda and Yamamoto's (1995) causality test, which we will carry out in this study, enables us to analyze whether or not there is a causal relationship (unidirectional or bidirectional) between the dependent variable and the other variables in this study.

With regard to Toda and Yamamoto's causality test presented in table 2.6 below, we can see that there is no causal relationship between cycles and ODA. On the other hand, there is a unidirectional relationship between these two variables, from ODA to cycles. However, there is a unidirectional relationship between cycles and inflation, from cycles to inflation. In addition, there is a bidirectional relationship between cycles and trade openness. On the other hand, there is no causal relationship between cycles and population growth rates. Similarly, there is a unidirectional relationship between cycles and money supply, and then cycles and investment, moving respectively from cycles to money supply and from cycles to investment.

Table 2. 6: Toda and Yamamoto causality test

Null Hypothesys	Wald tests χ^2 statistic	P-value	Causality decision
Cycle ne cause pas ODA	4,0328	0,4016	Absence of causality
ODA ne cause pas Cycle	3,1085	0,0398	Causality, ODA cause cycles
Cycle ne cause pas INF	11,3801	0,0226	Causality, Cycle cause INF
INF ne cause pas Cycle	4,4789	0,3451	Absence of causality
Cycle ne cause pas Trade	80,8556	0,0000	Causality, Cycle cause Trade
Trade ne cause pas Cycle	16,7676	0,0021	Causality, Trade cause Cycle
Cycle ne cause pas GPOP	7,8011	0,0991	Causality, Cycle cause GPOP
GPOP ne cause pas Cycle	0,6551	0,9567	Absence of causality
Cycle ne cause pas MM	11,1899	0,0245	Causality, Cycle cause MM
MM ne cause pas Cycle	3,5356	0,4725	Absence of causality
Cycle ne cause pas INV	38,2675	0,0000	Causality, Cycle cause INV
INV ne cause pas Cycle	6,8821	0,1422	Absence of causality

Source: Author's construction

2.6.6 Summary of the individual results of Toda and Yamamoto's (1995) causality test for each country

Once we had verified causality in the panel as a whole, using Toda and Yamamoto's (1995) causality test, it was important for us to examine the individual effect of each country by first analyzing the nature of the causal link between business cycles and official development assistance. Estimation of the VAR model using the Toda and Yamamoto procedure will enable us to determine whether or not there is a causal relationship between these two variables for each of the CEMAC countries. The results after estimation are summarized in the table below.

Table 2. 7: Results of Toda and Yamamoto's (1995) individual causality test between cycle and ODA

Country	**Nature de la relation**
Cameroon	Unidirectional causality (APD => Cycle)
Congo	Absence of causality
Gabon	Absence of causality
Equatorial Guinea	Absence of causality
Central african Républic	Unidirectional causality (APD => Cycle)
Chad	Absence of causality

Source: Author's construction

Analysis of the above table shows that Official Development Assistance (ODA) inflows increase business cycles in both Cameroon and the Central African Republic. This means that ODA causes the economic cycle in Cameroon and the Central African Republic over the period 1985 to 2019. However, there is no causal link between the economic cycle and official development assistance in countries such as Congo, Gabon, Equatorial Guinea and Chad.

However, we can note some significant causalities. To complete our study, we carried out an individual analysis for each CEMAC country, in order to detect the nature of the causal link (see table A2.3 in appendix 2), and observed that:

- In Cameroon, there is a unidirectional relationship between the cycle and aid, from official development assistance to economic cycles over the period 1985 to 2019;
- In Congo, there is no causal link between the cycle and official development assistance over the period 1985-2019;
- In Gabon, there is no causal link between the cycle and official development assistance over the period 1985-2019;
- In Equatorial Guinea, there is no causal link between the cycle and official development assistance over the period 1985-2019;
- In the Central African Republic, there is a unidirectional relationship between the cycle and aid, from official development assistance to economic cycles over the period 1985-2019;
- In Chad, there is no causal link between the cycle and official development assistance over the period 1985-2019.

2.7 Robustness check

The long-run coefficient of fully modified ordinary least squares (FMOLS) by Phillip and Hansen (1990), and dynamic ordinary least squares (DOLS) developed by Stock and Watson (1993), are presented in Table A2.4 and Table A2.5 below. FMOLS and DOLS have been estimated to check the robustness of the ARDL estimation results. The FMOLS technique enables semi-parametric correction of auto-correlation in the co-integration vectors, and solves the endogeneity problem. The DOLS method adds first-difference regressor lags and leads to the specifications. The FMOLS and DOLS results support the ARDL long-run estimation results. The coefficients and signs of all our exogenous variables are similar to those of the ARDL long-run estimate, with a few exceptions. With a few exceptions because in the fully modified ordinary least squares, the sign of the trade openness variable is positive whereas it is negative in the long-run ARDL model. Azam and Feng (2022) find the same result in their work for developing countries. The authors show that official development assistance increases economic growth over the period 1985 to 2018, using fixed-effects and robust least-squares estimators. Generally speaking, official development assistance is seen as helping to promote the growth of human development, as financial flows can be used to promote economic growth. Various studies have also documented this association (Fielding et al., 2006; Maqsood and Ullah, 2014; Boateng et al., 2021).

Chapter conclusion

The aim of this study was to analyze the impact of official development assistance on the economic cycles of CEMAC countries. This was achieved by using the ARDL method to capture the relationship between aid and cycle in the long term over a period from 1985 to 2019. Robustness was ensured by using the FMOLS and DOLS methods to confirm the ARDL results. The choice of this study period is justified by the availability of data at this date.

The results of our research reveal that the optimal number of lags selected is three (03). Furthermore, analysis of the Kao (1999) cointegration test reveals that all the variables in the model are cointegrated. Our results also show that, in the short term, official development assistance, in addition to having a negative effect, has no significant impact on the output gap of CEMAC countries. On the other hand, official development assistance, in addition to having a positive and statistically significant long-term influence on the output gap, is procyclical. The

significance of ODA on the output gap is not negligible. This result is closely in line with a large number of studies in the literature asserting that the presence of ODA stimulates growth in recipient countries. Furthermore, using Toda and Yamamoto's (1995) causality test, we were able to observe that there is a causal relationship between ODA and the business cycle, running from ODA to the cycle. Thus, ODA channeled to CEMAC countries is vital for the economic development of the countries in the sub-region. Policies should be geared towards making better use of aid, in particular to create an environment conducive to human development.

The results obtained in this study have policy implications at several levels. Firstly, in order to control the CEMAC countries' economic cycle and external economic transition, governments should strive to set up appropriate policies. Indeed, it makes sense to set up an appropriate tax system to control donor aid. Strong macroeconomic policies and liberalization reforms are needed to disseminate information and encourage new investment, and hence the import of high-tech goods and services. Secondly, policy-makers should use sources of aid to develop intangible infrastructures, in this case educational establishments and healthcare services. Thirdly, the results listed above can demonstrate the severity of corruption in public institutions on the country's economic performance. However, there is ample evidence that high institutional quality enhances the desired impact of official development assistance on national economies. Consequently, policy-makers should strive to establish a transparent public environment. In particular, the level of accountability in public institutions must be improved and maintained. This will help maximize the contribution of aid to promoting and sustaining long-term economic growth.

CHAPTER III: FOREIGN DIRECT INVESTMENT AND CO-MOVEMENTS OF ECONOMIC CYCLES IN THE CEMAC ZONE

Introduction

Foreign direct investment plays a very important role in macroeconomic models, international business cycles, and economic policy recommendations depend heavily on the level of financial integration of a given group of countries. Moreover, the degree of financial integration is the fundamental transmission mechanism of business cycle synchronization (Beck, 2019). Information on the relationship between capital mobility and business cycle synchronization is particularly important in the context of national monetary integration in the CEMAC region. On the one hand, a high degree of cyclical correlation is a prerequisite for the effective implementation of common monetary policy. On the other hand, the introduction of a common currency requires a high degree of capital mobility, by eliminating exchange risks and transaction costs, and harmonizing regulations.

Consequently, the nature of the relationship between foreign direct investment (FDI) and business cycle synchronization is crucial to the future of the CEMAC sub-region and its potential expansion. Thus, the main contribution of this chapter is based on an examination of the different channels through which capital market integration in general and FDI integration in particular affect business cycle synchronization.

However, research into the analysis of economic fluctuations has developed considerably over the last ten years, under the influence of economic integration, through the notion of globalization and trade openness. This idea has been endorsed by several researchers with the synchronization of economic cycles between countries (Agénor et al., 2000; Inklaar et al., 2005; Fiess Nobert, 2007; Artis and Okubo, 2009). With such dependence, the question on most researchers' minds is how to find the factors responsible for this synchronization.

However, the synchronization of national economic cycles between countries will facilitate the implementation of monetary policy due to the increased volatility of capital flows, particularly foreign direct investment (FDI) in CEMAC countries, as this capital will help to orient the position and sequences of the clearly defined common policy. Desynchronization, on the other hand, will complicate the operation of the economic and monetary union, as countries in different phases of the cycle face different monetary requirements. That said, synchronization is not static, but evolves over time (Carmignani, 2010).

However, a monetary[44] union is defined as a geographical area in which the countries forming the zone have a single currency. For a monetary union to be economically viable and profitable, the countries that make up the union must be in the same phase of the cycle. According to Sarr and Ndiaye (2011), the difficulty of finding the optimal formula for the conduct and effectiveness of common monetary policy in a monetary union derives from both the asymmetric nature of shocks and the asynchronous nature of cycles. Indeed, when the co-movements of activity are discordant, stabilizing the cycles would require a restrictive monetary policy in some countries and an accommodating one in others.

In the same vein, a more recent wave of literature has noted that one of the factors contributing to more symmetrical business cycles is the intensification of trade between countries (Frankel and Rose, 1998). In the case of the CEMAC countries, we can think of the economic attractiveness of foreign capital flows, notably Foreign Direct Investment in these countries. Following the example of other countries around the world, the CEMAC countries of Central Africa have defined strategies to attract the FDI needed to accelerate their development. It therefore makes sense for us to ask ourselves the following questions: What is the impact of foreign direct investment on the synchronization of economic cycles in CEMAC countries? What are the channels through which foreign investment affects the synchronization of economic cycles in the CEMAC zone?

The aim of this chapter is to analyze the link between foreign direct investment and the synchronization of economic cycles in the member countries of the Economic and Monetary Community of Central African States. The interest of this study is twofold and important, as it will enable us to analyze both the effect of foreign direct investment on the synchronization of economic cycles, and the channels through which foreign investment affects the synchronization of economic cycles in the CEMAC. To our knowledge, no such study has yet been published for the CEMAC countries.

This chapter is divided into three sections. Section 1 will present the stylized facts. Section II will be entitled FDI and business cycle synchronization: an analysis from the point of view of the literature. Finally, in section 3, we present the methodological approach and the interpretation of the results obtained. The conclusion will bring this chapter to a close.

[44] According to Masson and Taylor (1992), a monetary union is a zone in which exchange rates between member countries are characterized by a fixed and permanent relationship, and where, in the absence of capital controls, only a single monetary policy prevails.

Section I: FDI in the CEMAC zone: some stylized facts

3.1 Stylized facts

3.1.1 FDI trends in CEMAC

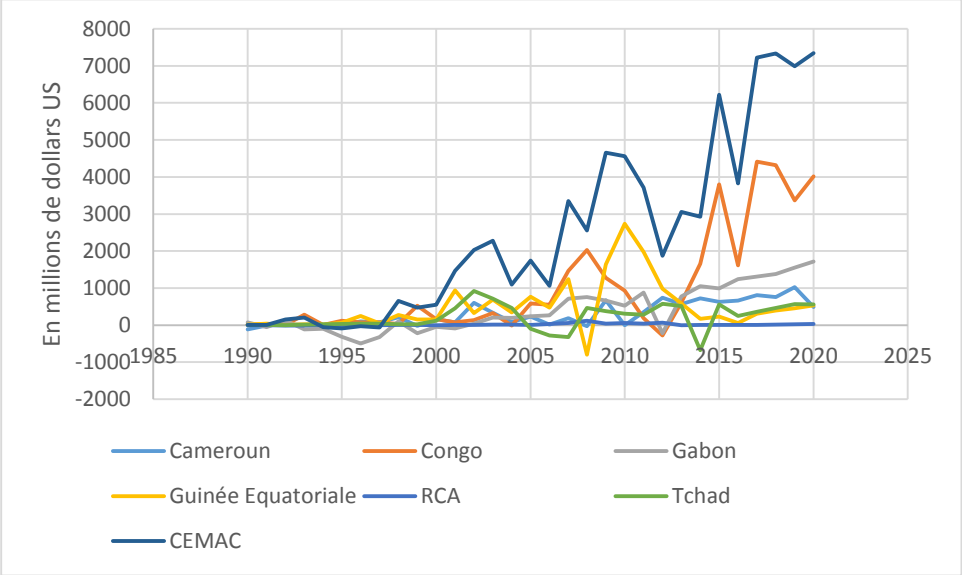

Figure 6. 1: Evolution of inward foreign direct investment in CEMAC

Source: Autho's construction, based on UNCTAD data.

Investment is a medium of activity for receiving nations, which focus as much as possible on the search for economic gain through benefits and costs. In SSA countries, particularly those in the CEMAC zone, attempts at reform were made in 1980 to attract foreign capital. But it wasn't until 1990-1994, when a second reform of the investment code was introduced under the auspices of donors, that foreign investment began to take off again. In fact, foreign direct investment inflows to CEMAC countries are generally small, vertical in nature and targeted at specific sectors of attractiveness (UNCTAD, 2020).

Figure 3.1 above provides a perfect illustration of the evolution of FDI inflows for each CEMAC country. From figure 3.1, we can see that from the 1990s to 1997, individual CEMAC countries received very little FDI, to the point where some countries hovered around zero. Gabon, on the other hand, had a negative FDI inflow balance over the same period. From 1998 onwards, Congo and Equatorial Guinea began to stand out from other countries in the sub-region in terms of capital inflows. As a result, from the early 2000s to 2020, we can observe a remarkable evolution in FDI inflows for each CEMAC country, albeit in fits and starts.

The Congo is the first country in the zone to have received the most FDI up to 2020 at $4015.53 million, despite a drop in 2016, 2018 and 2019. The 2019 figure stands at $3366.08 million. Gabon ranks second among the sub-region's top FDI recipients. The country received $1553.13 million in FDI in 2019 and $1716.51 million in 2020, representing an increase. Although Cameroon is down on the list of countries receiving the most FDI in the CEMAC zone, it is in third place with a figure of $488.22 million in 2020, compared with $1,026.91 million in 2019.

Chad and Equatorial Guinea occupy fourth and fifth place respectively. FDI inflows to Chad are estimated at $566.63 million in 2019 and $557.69 million in 2020, representing a slight increase. Equatorial Guinea's FDI inflows are estimated at $452.28 million in 2019 and $529.89 million in 2020. CAR is the only country in the community with a low level of foreign direct investment. In 1990, it received $4.35 million. The amount oscillated from low to high until the early 2000s, when the country experienced a low inflow of additional foreign direct investment ($0.88 million was the amount recorded in that year). It wasn't until 2008 that CAR experienced a meteoric rise in FDI, with an estimated US$117.11 million. After 2008, CAR experienced a remarkable drop in FDI inflows into the country until 2019 and 2020, with amounts equal to $25.60 million and $34.74 million respectively.

Overall, FDI flows to CEMAC countries have risen slightly compared with previous years: $7330.84 million in 2018, $6990.66 million in 2019 and $7342.60 million in 2020. Such a drop in FDI flows may be reflected in low oil prices and the adverse effects of the commodity crisis, which have resulted in a contraction of FDI flows in Africa, particularly in the major commodity-exporting countries. According to UNCTAD (2018), FDI flows to Central Africa fell by 22% to US$5.7 billion between 2016 and 2017. This downward trend in FDI inflows is also visible at CEMAC level.

The recovery phase observed from 2000 onwards is the result of a vast program of economic reforms implemented in the early 1990s in an attempt to stem the economic crisis facing the CEMAC economies. The various economic reforms put in place include: devaluation, to boost exports and achieve a competitive exchange rate; privatization of public enterprises; deregulation, to remove barriers to market entry and exit; trade liberalization; tax reforms to broaden the tax base and reduce marginal tax rates; and finally, promotion of property rights to facilitate wealth creation.

3.1.2 Foreign direct investment inflows between African RECs

Looking at figure 3.2 below, we can see that since the advent of the coronavirus pandemic (COVID-19), CEMAC is the only community to have recorded an increase in FDI inflows in 2020. Subsequently, the Community of Sahelo-Saharan States (CEN-SAD) is one of Africa's top FDI-receiving communities, with the highest amount for this community in 2008 at $3,124.92 million. The Common Market for Eastern and Southern Africa (COMESA) is the second-largest FDI-receiving community in Africa. The Southern African Development Community (SADC) is in third place. The CEMAC countries only come fifth.

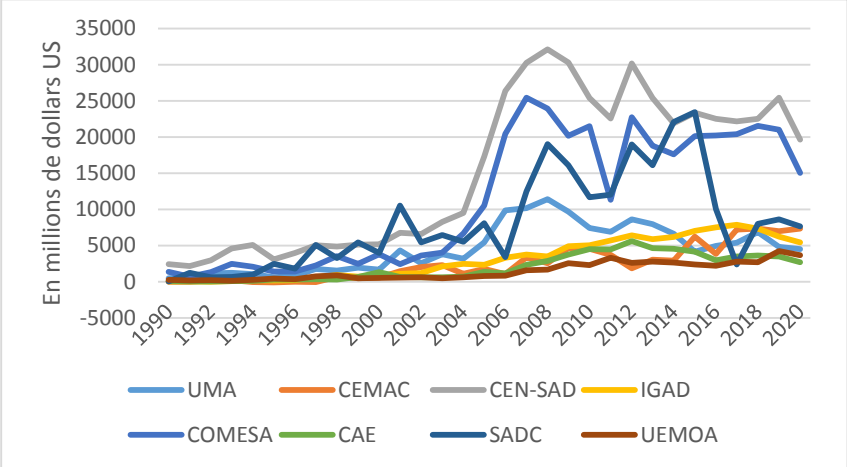

Figure 3. 2: Foreign direct investment inflows between CEMAC and other African communities

Source: Author's construction, based on UNCTAD data.

Figure 3.3 provides a perfect illustration (in percentage terms) of all that has been presented above.

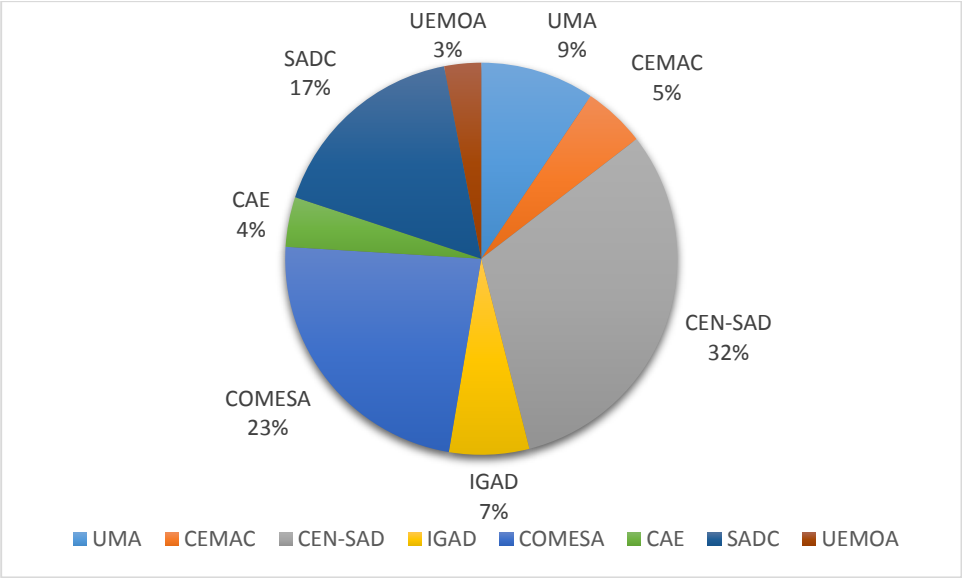

Figure 3. 3: Percentage change in FDI inflows to various African RECs

Source: Author's construction, based on UNCTAD data.

Thus, CEMAC is by far the last destination for FDI in Africa. The particularity of this community is that it predominantly hosts foreign investment in the primary sector, which makes it somewhat vulnerable to shocks linked to the deterioration of commodity terms of trade (Noah and Fambon, 2019).

3.1.3 Disparities in the distribution of foreign direct investment

Figure 3.1 above shows some differences from one country to another in terms of foreign investment inflows. This is due to the particularities of each territory in terms of public action and the occurrence of a number of economic events specific to that country. For example, Equatorial Guinea began extracting its own oil in the 2000s, while Chad began its own oil extraction around 2002 with the construction of the Chad-Cameroon pipeline. As a result, these countries attracted huge amounts of capital in record time. Reaching the completion point of the Heavily Indebted Poor Countries initiative in April 2006 gave Cameroon more leeway to stabilize its public finance balance for a "new beginning" (Touna Mama, 2008). From this point of view, it would be an indicator of foreign investor attraction following the privatization of a number of public enterprises.

3.2 Relevance of foreign direct investment in CEMAC

3.2.1 Origins of foreign direct investment in CEMAC

Foreign direct investment in the countries of the Central African Economic and Monetary Community comes from a variety of sources. France and China are the main recipients of FDI in CEMAC.

Table 3.1 shows the evolution of Chinese FDI to CEMAC countries.

Table 6. 1: Evolution of Chinese FDI inflows to CEMAC over the period 2004 - 2014 (in millions of US dollars)

	2004-2007	2008-2011	2012-2014
Cameroon	12,46	48,62	135,17
Congo	36,82	131,71	729,63
Gabon	43,38	118,4	158,82
Equatoriale Guinea	25,46	78,87	291,21
RCA	2,49	33,75	56,01
CEMAC	127,88	488,39	1677,55

Source: Author's construction, based on Chinese FDI statistical bulletin.

As shown in Table 3.1 above, the evolution of Chinese foreign direct investment in CEMAC countries has been very gradual. From US$127.88 million over the period 2004-2007, this FDI almost quadrupled, reaching US$488.39 million over the period 2008-2011, then an average of US$1,677.55 million over the period 2012-2014. Congo appears to be the biggest beneficiary of these investments. This can be justified by the very close ties of a long-standing partnership, as Congo, a people's republic until 1990, had a socialist-oriented economy. Probably due to decades of political instability, CAR is the least attractive country in the sub-region in terms of foreign direct investment. Moreover, as in the other five countries, Chinese FDI in the Central African Republic is growing rapidly.

Over the past decade, foreign direct investment (FDI) flows into Africa have evolved as new sources of investment and new industries have emerged. The COVID-19 crisis tarnished immediate investment prospects, but African decision-makers have placed their bets on long-term trends to help revive their economies. Low levels of foreign investment are holding back Africa’s participation in global value chains (GVCs) (UNCTAD, 2021). By making a clear

contribution to boosting productivity and integrating national companies into global[45] markets, FDI is beneficial for recipient countries. Unfortunately, FDI inflows to Africa and the continent's participation in MVCs remain low (UNCTAD, 2020 and 2021): Africa, which received just 1% of global FDI flows in 2000, managed to increase its share to 3% in 2018. However, its level of participation in global value chains has not changed over the period, remaining constant at 2%. Conversely, the share of developing countries in the Asia-Pacific region in FDI flows has risen from 10% to 31% with, at the same time, an increase in their participation in GVCs from 11% to 17% (UNCTAD, 2021). FDI and its integration into global value chains remain underdeveloped in Africa compared to other regions.

3.2.2 Effectiveness of foreign investment for recipient countries

Although there is a theoretical consensus on the positive impact of FDI on developing countries, empirical research has not automatically concluded that it has a positive impact on recipient economies. Many authors have found that the most attractive factors are also vectors of FDI's economic efficiency for host countries. Numerous empirical studies have shown that there is a positive relationship between FDI and growth when the host country has favorable initial conditions, notably a minimum level of economic development or capacity to create local wealth, particularly a sufficiently high level of education. Studies by authors such as Borensztein et al (1998) and Li and Lui (2005) show that foreign direct investment has a knock-on effect on growth when recipient countries have a high level of human capital, particularly when education levels rise.

Blomstrom and Kokko (1997) studied three regional economic groupings in North and Central America and found that FDI flows had the greatest impact when regional integration agreements were accompanied by domestic market liberalization and stabilization of the macroeconomic frameworks of member countries.

In conclusion, the importance of FDI in economies, particularly developing economies, stems from its direct and indirect effects on production factors (human capital, physical capital) as well as on competitiveness and economic growth. However, host countries need to create the right conditions for these investments to be profitable, in particular by strengthening their human capital base.

[45] The rapid growth of newly industrialized Asian economies in recent decades is a perfect illustration of this phenomenon.

Section II: Foreign direct investment and business cycle synchronization: a literature review

3.3 Foreign direct investment: an ambiguous factor in business cycle synchronization

3.3.1 The financial driver of business cycle synchronization

The notion of economic globalization is closely linked to the economic and financial relations that have prevailed on a global scale since the 1990s. Empirical work shows that economic integration amplifies the transmission of global shocks and the international spillover of national shocks, leading to the synchronization of national business cycles (Kose et al., 2008; Belke et al., 2017). However, several studies have documented the process of increased business cycle synergy between economies in recent decades (Antonakakis and Scharler, 2012; Belke et al., 2017; Transcoso and Gomes, 2020), as well as an increasing influence of global factors on the synchronization of national or regional business cycles (Kose et al., 2003; Kose et al., 2008), leading some to argue for the existence of a global business cycle (Crucini et al., 2011).

Following the global financial crisis of 2007 - 2008, a large body of research has focused on examining the ability of financial markets to propagate shocks to economic entities on a global scale on the real side of economies. The theoretical literature on international business cycles (Calderon et al., 2007; Pentecôte et al., 2013; Antonakakis and Tondl, 2014; Kollmann, 2019) suggests that foreign direct investment and access to international financial markets can reduce the level of co-movement between countries, as they stimulate the specialization of production by reallocating capital according to countries' comparative advantages. By enabling cross-border ownership of means of production and assets, financial integration offers investors better insurance against production risks resulting from asymmetric shocks (Baele et al., 2004; Schiavo, 2008).

In addition, a positive productivity shock in one country can attract investment and thus increase sectoral specialization in other economies as long as the marginal productivity of capital and labor increases (Kehoe et al., 1995). Financial integration can affect the degree of synchronization of business cycles by generating strong demand and secondary effects on supply. For example, savings and investment decisions can affect asset prices and business cycles in other countries through financial flows (Artis et al., 2008). In this way, the supply of foreign capital can lead to a positive correlation between countries of origin and destination

(Fidrmuc et al., 2012), amplifying the possibility of idiosyncratic shocks reaching other countries.

In contrast, corporate finance theories imply that negative productivity shocks can lead to capital outflows and widen output gaps between integrated financial economies (Trancoso and Gomes, 2020). A shock to bank capital in one country may force banks to reduce lending to other countries, leading to a coordinated increase in the output of interconnected economies (Kalemli-Ozcan et al., 2013). In addition, financial integration can facilitate the transfer of resources between countries by transferring capital from economies experiencing negative shocks to economies experiencing positive shocks through foreign direct investment. The latter enable countries to specialize (Kalemli-Ozcan et al., 2003), so high levels of financial integration can actually reduce the synchronization of business cycles.

The differences indicated by the empirical studies may be due to methodological differences, whether in the application of indirect measures to economic and financial variables, or in the modelling of their relationship. For example, cross-sectional studies including periods of turmoil and calm (Otto et al., 2001; Kose et al., 2003; Imbs, 2006), find a positive correlation between financial openness and GDP co-movement. Other work shows that this positive relationship manifests itself strongly among economies that share high levels of integration such as OECD[46] economies (Otto et al., 2001; Imbs, 2010), and European economies (Schiavo, 2008; Antonakakis and Tondl, 2014).

3.3.2 FDI in CEMAC: an ambiguous factor in synchronizing economic cycles

Theoretically, the impact of foreign direct investment and financial integration on business cycle synchronization behavior is ambiguous. Firstly, real business cycle models suggest that, without impeding capital flows, capital flows to countries with the highest rates of return help to reduce business cycle correlations (Backus et al., 1992; Ambler et al., 2004; Rothert, 2020). Similar conclusions can be drawn from models that focus on banking integration (Morgan et al., 2004). Moreover, free capital flows enable countries to hedge against idiosyncratic shocks and explore the benefits of specialization according to their comparative advantage (Kalemli-Ozcan et al., 2001; Arkolakis and Ramanarayanan, 2009). As a result, international asset transactions lead to higher consumption correlations, while gross domestic product synchronization declines. Similarly, the relationship between industrial specialization and risk

[46] Organization for Economic Cooperation and Development.

sharing has been explored empirically by authors such as Kalemli-Ozcan et al. (2003) and Dées and Zorell (2012).

Secondly, high levels of financial integration can lead to macroeconomic shock effects (Heathcote and Perri, 2003; Kose et al., 2008; Beck and Stanek, 2019), thus contributing to greater business cycle synchronization. In addition, models that emphasize imperfect information, liquidity constraints and capital adjustment costs (Calvo and Mendoza, 2000; Devereux and Yetman, 2010) suggest that restricting capital flows leads to real output correlations that decrease as investors pool and withdraw at the same time. In general, models emphasizing the role of financial contagion predict a positive relationship between foreign direct investment and business cycle correlation (UEDA, 2003). Foreign direct investment (FDI) is the second channel for the propagation of business cycles associated with capital mobility. In theory, FDI facilitates global value chains (GVCs) and intra-industry trade within these chains (Fukao et al., 2003). As a result, economic shocks can propagate through GVCs to all countries in the chain, facilitating closer synchronization of business cycles.

Empirical research into the relationship between business cycle synchronization and financial integration reflects this theoretical ambiguity. In the literature, some authors (Otto et al., 2001; Imbs, 2006) find a positive effect of capital mobility on business cycle synchronization, but do not take into account the different channels that can affect this cycle synchronization. The common feature of these studies is the use of cross-sectional data, so that their results are mainly due to spillover effects that cannot be separated due to the nature of the data. Kalemli-Ozcan et al (2013) in their seminal papers also explained that the positive link between financial integration and business cycle synchronization is an artifact of the use of conversion data. They prove that, when considering the temporary size and control of infection in global financial crises, the impact of financial integration on business cycle synchronization is negative, as expected when using business cycle models (Backus et al., 1992) and integrated models (Morgan et al., 2004). This result is validated by Cerqueira and Martins (2009), Monnet and Puy (2016) and Beck (2019). However, the work of Borowski et al. (2020) shows that the stronger attribute links are linked to the closer synchronization of the business cycle.

Another strain of literature considers the impact of the exchange rate regime on business cycle correlation. Exchange rate variability has a significant impact on business cycle synchronization in some research studies (Inklaar et al., 2008; Pentecôte et al., 2013; Duval et al., 2014). In other studies, however, this depends on the model specification (Akın, 2012; Otto

et al., 2001), or is insignificant (Crosby, 2003; Herrero and Ruiz, 2008). The impact of monetary integration on business cycle correlation is positive and significant in most research (Fidrmuc, 2004; Rose, 2011; Beck, 2013a and b), but the representative variable of monetary union proves fragile in some papers (Baxter and Kouparitsas, 2005; Böwer and Guillemineau, 2006). The literature on business cycle synchronization is linked to the theory of optimal currency areas (OCAs) (Mundell, 1961; McKinnon, 1963; Kenen, 1969).

The articles listed above focus on short-term capital flows, while another category of literature focuses on FDI and yields contradictory results. For example, Herrero and Ruiz (2008) and Antonakakis and Tondl (2014) found a negative correlation between FDI and business cycle correlation. Jansen and Stokman (2014) found a positive correlation. Meanwhile, Lee (2010) obtained mixed results, with FDI being statistically non-zero in most specifications. Consequently, the impact of FDI on business cycle synchronization is ambiguous, especially as these authors do not account for model uncertainty and reverse causality. Of all the literature listed above, we can note that no study, to our knowledge, addresses the channels through which foreign direct investment affects business cycle synchronization.

3.4 Foreign direct investment and business cycle synchronization: role and transmission mechanisms

3.4.1 The role of foreign direct investment in business cycle synchronization

As documented in the literature, capital flows are often undulating and highly cyclical (Forbes and Warnock, 2012; Broner et al., 2013). Over the past three decades, many countries have experienced waves of capital flows. Specifically, for a given country, capital inflows, particularly foreign direct investment, increase during phases of economic expansion and contract significantly during crises and recessions. Such a situation could trigger currency devaluations, burst asset price bubbles and recessions (Dagher and Jihad, 2010; Burger and Ianchovichina, 2014; Calderón and Kubota, 2014).

There is an abundant literature on capital flows. Several studies deal with foreign capital, particularly the volatility of foreign investment over time or between types of capital (Broner and Rigobon, 2004; Broto et al., 2011). In recent years, the characteristics of extreme volatility in foreign investment have become increasingly evident. As a result, some researchers have turned to the theme of extreme foreign capital (Calvo, 1998; Reinhart and Reinhart, 2008; Forbes and Warnock, 2012; Forbes and Warnock, 2020).

However, the last thirty years have been marked by the growing integration of the global economy, a process characterized not only by the acceleration of international trade and capital flows, but also by the production processes of companies established worldwide (commercial FDI, vertical integration). The main result of these trends is the increasing synchronization of the global economic cycle of economies in different regions (Kose and Yi, 2001; Artis et al., 2004; Baxter and Kouparitsas, 2005; Aiolfi et al., 2006).

While most work examines the dynamics of national business cycles, there is a branch of the literature that focuses on analyzing the degree of international synchronization of regional business cycles (Ponce, 2001; Erquizio, 2008). Of course, this is a sensitive issue, as it is clear that a given region may exhibit different cycles depending on how it absorbs international shocks, itself a function of factors such as its production structure, degree of exposure to external shocks, local economic policies or financial, infrastructure and weather conditions, among others (Altonji and Ham, 1990; Clark, 1998).

3.4.2 Transmission mechanisms favoring cycle synchronization

The literature identifies numerous factors that favor the transmission of periodic movements from one country to another. These factors include financial market interactions, business internationalization and consumer confidence.

In 2002, the OECD published an article in which the transmission mechanism of the various factors mentioned above was described. As a result, the slowdown in the US economy that began in the ICT[47] sector was accompanied by major corrections in stock prices in many countries. So, in general, major shocks to major economies also have repercussions in the rest of the world through "financial market interactions" (Galati and Tsatsaronis, 2003). The wealth effect of equity price correlations between countries is a potentially important transmission mechanism, given the increase in household equity portfolios (Boone et al., 1998).

Another more difficult mechanism for reinforcing cycle synchronization is the "internationalization of companies", except that this can have an effect on share prices. For example, if companies are multinational, the need to divest due to changes in one market may lead to reduced activity in other countries, and vice versa. It is difficult to understand precisely the potential significance of these effects. However, FDI flows have risen sharply in recent

[47] Information and Communication Technology.

years, suggesting that this mechanism may be increasingly influential (OECD Economic Outlook, 2002).

Finally, the transmission of economic fluctuations can also be influenced by "intangible" factors such as consumer confidence. There is evidence that "consumer confidence" is increasingly influenced by stock market trends. This helps to amplify the impact of stock market trends on private consumption, even in countries where households hold very few equity portfolios. Given the stronger correlation with stock market profitability in the context of business confidence, a fall in demand in one economy or region could have a similar impact on private investment in other countries. More generally, however, it is difficult to say whether the cross-country correlation of confidence indices strengthens systematically over time, increasing the importance of this transmission mechanism or that of the underlying mechanism (OECD Economic Outlook, 2002).

3.5 Foreign direct investment and business cycle synchronization: a synthetic assessment

Two main factors can lead to the synchronization of business cycles: common global shocks and bilateral spillovers of idiosyncratic shocks from one economy to another (Cesa-Bianchi et al., 2019). While some work has studied the nature of shocks and focused on those that propagate across borders, we argue that shocks can be transmitted simultaneously through different channels (trade integration, FDI integration and financial integration) (An et al., 2021).

3.5.1 Trade integration

For production and trade models (inter-industry versus intra-industry trade), the link between trade integration and business cycle co-movement has been discussed theoretically. Eichengreen (1992) and Krugman (1993), for example, argue that closer trade links can lead to greater specialization of production, which in turn leads to less business cycle synchronization. In contrast, Frankel and Rose (1998) show that economies with more trade links tend to have more closely correlated business cycles, if intra-industry trade accounts for the majority of trade. Shin and Wang (2004) find that in 12 Asian economies, intra-industry trade tends to favor business cycle synchronization, rather than inter-industry trade or trade volume itself.

So, if inter-industry trade dominates in all economies, trade can lead to divergent business cycles. On the other hand, increased intra-sector trade can lead to more synchronized business cycles. Numerous empirical studies have shown that increased trade between two economies leads to more synchronized business cycles between them (Baxter and Kouparitsas, 2005;

Inklaar et al., 2008; Pyun and An, 2016; Lopez et al., 2021; Lee et al., 2022). However, Kalemli-Ozcan et al. (2013) and Abiad et al. (2013) find that trade integration has a negligible effect on business cycle co-movement, given the unobserved heterogeneity of matched economies within the panel. Also, An et al. (2021) including fixed effects for matched economies and controlling for endogeneity, show that trade integration leads to business cycle synchronization with some variation.

While previous research has predicted that different trade patterns between economies lead to different business cycle co-movement outcomes when examining trade data at the economic level, little work has provided evidence at the micro or even macro level using disaggregated data. Furthermore, as global production networks become more connected and complex, it is important to understand the detailed trade links between industries and economies. Using an industry-level inter-economy panel dataset on manufacturing output and trade, Di Giovanni and Levchenko (2010) find that intra-industry trade has a stronger positive effect on the co-movement of output between pairs of industries that share intermediate inputs. This means that vertical trade along the value chain can generate stronger linkages than trade in finished goods. Theoretically, intermediate inputs and trade in final goods could have similar or different effects on business cycle linkages, depending on which sectors form specific trade links. While trade in final goods can occur both within and between industries, trade in intermediate inputs tends to create vertical links within industries. Duval et al. (2016) show that bilateral trade intensity, measured in value added, has a positive and statistically significant effect on synchronization by distinguishing value added from gross trade. Miyamoto and Nguyen (2021) use an augmented two-sector, multi-economy real business cycle model to show that international input-output linkages lead to lower output volatility in each economy, while the spillover effects of a given shock on the economy increase thanks to linkages.

3.5.2 Integration of foreign direct investment

Although FDI flows have increased considerably in recent decades, the link between FDI and business cycle synchronization has been the subject of relatively little research. FDI integration contributes to the value and supply chains through which idiosyncratic shocks can propagate from one economy to another. Indeed, the relationship between FDI and business cycle co-movement can depend on the type and shocks (Jansen and Stokman, 2011; Fries and Kappler, 2015). Firstly, horizontal foreign investment indicates that companies carry out similar activities in different locations in order to gain better access to foreign markets. If two different

institutions are operated by the same multinational in two different economies (in the absence of idiosyncratic shocks), the multinational's foreign investment activity will increase business cycle synchronization between the two. However, idiosyncratic shocks and market conditions can lead to unpredictable links with business cycle co-movement.

Vertical foreign direct investment occurs when companies wish to take advantage of differences in international factor prices, such as wages. Companies allocate production processes in different economies according to profitability. Thus, efficient resource allocation through vertical foreign investment between economies leads to business cycle differentiation, but common intermediate inputs and production processes in vertical FDI lead to synchronization (Di Giovanni and Levchenko, 2010), on the one hand. On the other hand, while horizontal FDI can substitute for international trade, vertical FDI can increase trade in intermediate and final goods, confounding the link between business cycle co-movement and trade integration.

Furthermore, the types and nature of shocks affect the relationship between FDI integration and the co-movement of the business cycle. In this case, if the home and host economies of FDI are subjected to common shocks, the parent company and its subsidiaries in the host economy may react symmetrically to the shock, thus leading to a synchronization of business cycles between the home and host economies. On the other hand, if the host economy experiences idiosyncratic negative shocks, the parent company may try to reallocate resources to more profitable locations, leading to a divergence in the business cycle. It should be noted, however, that FDI links can even transmit idiosyncratic shocks from the host economy to the home economy. As a result of this FDI spillover effect, business cycles can be more synchronized.

Earlier empirical work such as that by Stevens and Lipsey (1992) and Desai and Foley (2004) found a strong correlation between the rate of return and subsidiary nvestment within multinationals, which may lead to a co-movement of the business cycle. Budd et al (2005) find that, for multinationals, the parent company's profit per worker is positively related to foreign wages in most subsidiaries, implying that international profit sharing can transmit economic conditions from one country to another. Using eight advanced economies for the period 1982-2010, Jansen and Stokman (2011) show that the positive relationship between FDI and synchronized business cycles was stronger during the period 1995-2010 than before 1995. The results suggest that global foreign investment linkages lead to business cycle synchronization, while direct investment in regional blocs leads to business cycle divergence.

FDI has two modes of entry: greenfield foreign direct investment and cross-border mergers and acquisitions. In the first case, greenfield FDI involves the construction of new facilities, which can increase the stock of physical capital, create new jobs and increase market competition. On the other hand, foreign investment generally refers to the acquisition of local companies through mergers and changes of ownership. Because of their distinct characteristics, the impact of the two modes of FDI on the economic growth of the host country can be different. Wang and Wong (2009) find in their study that while greenfield FDI stimulates economic growth, the positive impact of M&A on growth may depend on the absorptive capacity of the host economy, such as sufficient human capital. Harms and Méon (2011) also argue that while greenfield investments appear to boost growth significantly, the impact of M&A on growth is uncertain. Consequently, it also seems reasonable to predict the differential impact of greenfield FDI and cross-border M&A on the timing of business cycles. In particular, creative FDI is considered to have a greater impact on the destination economy's business cycle than cross-border mergers and acquisitions, as it creates new business facilities, new jobs and new economic activities, thus adding to the GDP of the destination economy.

3.5.3 Financial integration

Previous work on financial integration and the international transmission of real business cycles has provided mixed theoretical predictions. Some studies in the literature, such as those by Backus et al (1992), argue that financial integration can isolate the spillover effects of idiosyncratic shocks because financial market integration allows economies to share the risks associated with shocks or to rebalance asset portfolios. However, during the financial crises, Krugman (2008) coined the term "international financial multiplier" and argues that bank lending or debt linkages facilitate and amplify the cross-border transmission of negative shocks. Other studies introduce the transmission mechanism of financial shocks by incorporating financial integration into real business cycle models (Devereux and Yetman, 2010); Kalemli-Ozcan et al., 2013).

To date, empirical studies on the impact of financial integration on business cycle linkage have reached mixed conclusions (Kalemli-Ozcan et al., 2003; Imbs 2004). Davis (2014) reconciles the earlier debate by arguing that there are different transmission mechanisms (balance sheet effects versus wealth effects) in each market. This suggests that integrating equity and debt markets leads to different results in terms of business cycle coupling. For example, stock market integration leads to divergence in the business cycle, as negative domestic shocks reduce

domestic consumption but increase foreign savings (channeled to investment) through risk-sharing channels (when wealth effects dominate). Pyun and An (2016) demonstrate the different roles of equity and debt market integration in linking business cycles in normal times and during global financial crises. In particular, they point out that debt market integration with the US isolated balance sheet effects during the global financial crisis.

Kalemli-Ozcan et al. (2013) examine the different nature of shocks such as productivity shocks and financial shocks, and show that banking consolidation is associated with more diversified cycles in normal times, but leads to a greater degree of business cycle synchronization. Cesa-Bianchi et al. (2019) decompose shocks into common and idiosyncratic components to account for the heterogeneous impact of banking consolidation on business cycle co-movement. An, Kim and Pyun (2021) dissect debt market consolidation using economic pair data from 57 economies over the period 2001-2013 to classify debt market consolidation into short-term and long-term debt consolidation. They find nuanced evidence that short-term debt integration leads to business cycle synchronization during crises. However, integration of long-term debt markets appears to be associated with divergence of business cycles during crises.

Section III: FDI and business cycle synchronization in CEMAC: an empirical approach

This section is devoted to an empirical analysis of the effects of FDI on business cycle synchronization in CEMAC. The first part of this section will be devoted to presenting the methodological approach, while the second part will be devoted to the results.

3.6 Methodological approach

In this sub-section, we first present the data, data sources and measurement of the different variables that will be used in this study. We will then present the specification of the empirical model for our study. Finally, we will describe the econometric estimation technique we will be using.

3.6.1 Data and measurement of variables

The data used in this study covers all six CEMAC countries. These data come from secondary sources, notably the World Bank (WDI), UNCTAD and World Outlook. The frequency of this study extends from 1985 to 2019.

The dependent variable

Referring to the work of Abiad et al. (2013) and Duval et al. (2014), we use the quasi-correlation coefficient to measure business cycle synchronization. We primarily choose the quasi-correlation coefficient over other measures of business cycle synchronization such as the Pearson correlation coefficient and the absolute differential for two reasons. Firstly, compared with the Pearson correlation coefficient, our choice enables the degree and direction of connection between cyclical components to be measured chronologically, whereas the Pearson correlation coefficient offers only a global and static measure (Duval et al., 2014). Secondly, our choice is preferred to the absolute differential, as it measures dynamic correlation whereas the absolute differential measures convergence (Cesa Bianchi et al., 2019). Furthermore, it appears to be complete to the absolute differential as it simultaneously considers central tendency and dispersion features while the absolute differential focuses only on dispersion features (Abiad et al., 2013). Furthermore, following the studies by Frankel and Rose (1998) and Diebold and Rudebusch (2021), we approximate countries' total market economic activity by their respective real GDP and use the filter of Hodrick and Prescott (1997) to extract the cyclical evolution of real[48] GDP. Finally, business cycle synchronization between two countries i and j is calculated using the quasi-correlation coefficient of their cyclical components of real GDP according to formula (3.1) below:

$$Syn_{ijt} = \frac{\left(K_{it} - K_i^*\right) \times \left(K_{jt} - K_j^*\right)}{\delta\left(K_i\right) \times \delta\left(K_j\right)} \qquad (3.1)$$

Where Syn is the measure of the synchronization of the business cycles of country i and j at time t. K_{it} and K_{jt} are respectively the cyclical components of the real GDP of country i and j. K_i^* and K_j^* are respectively the means of these cyclical components. $\delta\left(K_i\right)$ and $\delta\left(K_j\right)$ are respectively the standard deviations of these cyclical components.

The variable of interest

Foreign direct investment inflows are the variable of interest in our study. This independent variable is measured as a percentage of GDP. However, FDI contributes to knowledge transfer, offers prospects for international integration and generates technological spillovers for host

[48] Researchers such as Frankel and Rose (1998) and Inklaar et al. (2008) have used industrial production to represent economic activity. Industrial production data are not available for countries in the Central African sub-region. Since quarterly or monthly data are preferred when tracking business cycles, most African countries do not have this type of data. As a result, annual data are used instead of quarterly or monthly data.

countries (Dinh and Nguyen, 2020). Moreover, FDI provides several positive influences for a country that have been discussed among researchers. FDI not only broadens the capital structure in the host country, but also offers positive externalities such as the transmission of knowledge and technology (Lacroix et al., 2021). Numerous other studies have explained that FDI inflows positively affect economic growth in the host country (Lacroix et al., 2021; Dinh and Nguyen, 2020) and financial development by Alfaro et al. (2004).

Control variables

Several variables were used as control variables in this study. These were: CPI-based inflation rate; domestic investment measured by gross fixed capital formation; population growth rate; trade openness and money supply (MM). Table 3.2 below gives a description of the variables in our study and the data sources.

Table 3. 2: Description of our study variables and data sources

Variables	Acronyms	Description	Sources
Synchronization of economic cycles	Syn	This variable is measured in terms of real GDP	WDI
Foreign Direct Investment	FDI	FDI inflows (as % of GDP)	UNCTAD
Inflation rate	INF	Measured by the consumer price index	WDI
Domestic investment	INV	Represented by gross fixed capital formation (as % of GDP)	WDI
Population growth rate	GPOP	As a percentage of GDP	WDI
Trade openness	Trade	Which is the sum of imports and exports as a fraction of GDP	WDI and Perspectives Mondes
Money supply	MS	Money supply M2: money in circulation excluding banks, savings, foreign savings, excluding public sector money	WDI

Source: Author's construction.

Table 3.3 below gives the descriptive statistics of our variables.

Table 3. 3: Descriptive statistics for study variables

Variables	Obs	Mean	Std.Dev.	Min	Max
LnSyn	191	2.287	.597	-.311	4.763
LnFDI	181	.803	1.634	-3.828	5.087
LnINF	210	4.301	.403	3.299	5.022
LnTrade	210	4.281	.483	3.275	5.618
LnINV	210	2.589	.781	.755	4.746
LnGPOP	210	1.027	.38	-1.348	1.795
LnMS	210	2.756	.342	1.747	3.684

Source: Author's calculations.

The descriptive statistics in Table 3.3 above show that the mean of business cycle synchronization is 2.287, the standard deviation is 0.597, the minimum is -0.311 while the maximum of the same variable is 4.763. Meanwhile, the FDI variable has a mean equal to 0.803, a standard deviation of 1.634, a minimum equal to -3.828 and a maximum equal to 5.087.

3.6.2 Empirical model and econometric estimation technique

3.6.2.1 Empirical model

In order to examine the channels through which foreign direct investment affects the synchronization of economic cycles in the CEMAC zone, we specify the empirical model below with reference to the studies by Frankel and Rose (1998); Kose et al. (2003); Imbs (2003); Duval et al. (2014); Cesa-Bianchi et al. (2019); Zouri (2020) and Bataka and Maï Assan Chedi (2022). Thus, the specification of our empirical model is as follows:

$$lnSyn_{ijt} = \alpha + \beta lnFDI_{ijt} + \gamma lnInf_{ijt} + \omega lnInv_{ijt} + \theta lnGPOP_{ijt} + \delta lnTrade_{ijt} + \varphi lnMS_{ijt} + \vartheta_{ij} + \mu_t + \varepsilon_{ijt} \quad (3.2)$$

Where Syn_{ijt} is the dependent variable that measures the synchronization of business cycles between country i and country j at time t. FDI_{ijt} represents foreign direct investment between countries i and j at time t. The variables Inf_{ijt} , Inv_{ijt} , $GPOP_{ijt}$, $Trade_{ijt}$, and MS_{ijt} , respectively represent the inflation rate, domestic investment, population growth rate, trade openness and money supply between countries i and j at time t. β, γ, ω, θ, δ and φ represent the parameters to be estimated. ϑ_{ij} denotes the country pair effect, while μ_t represents the time effect. ε_{ijt} represents the error term.

With the econometric model specification presented, we can now highlight the econometric estimation technique.

3.6.2.2 Econometric estimation technique

Equation (3.2) above requires some further procedures to be correctly estimated. First, we implement Pesaran's (2021) cross-sectional dependence test to discriminate between first-generation and second-generation unit root and cointegration tests. According to Hurlin and Mignon (2005), the former assumes cross-sectional independence, while the latter is performed under cross-sectional dependence. In addition, Pesaran's (2021) test enables us to choose the most appropriate estimation strategy for the model (3.2). Whether the test results corroborate the cross-sectional dependence hypothesis, we run Pesaran's (2007) second-generation unit root test and adopt an estimation strategy to overcome this cross-sectional dependence. Some studies (Hoechle, 2007; Reed and Ye, 2011; Chudik and Pesaran, 2015) demonstrate that estimation methods that neglect cross-sectional issues lead to biased and inconsistent estimators. Moreover, the presence of cross-sectional and time dependence in panel data means the relaxation of some of econometrics' traditional stochastic assumptions (Pesaran, 2021). Alternative estimation techniques need to be considered to obtain appropriate results.

The economic and econometric literature highlights several approaches to estimating cross-sectional dependency in static panel models. Spatial econometrics is one such approach. The latter estimation method incorporates the spatial weighting matrix, which is constructed according to the proximity or distance between geographical units (countries) (Anselin, 2013; Elhorst, 2014). The method based on spatial econometrics leads to biased estimators, as the use of the spatial weighting matrix does not entirely suppress cross-sectional dependence (Corrado and Fingleton, 2012; Moundigbaye et al., 2018). Indeed, the latter stems from factors other than geography, particularly in the economic domain where individual interdependence is more a matter of economic and socio-political factors (Conley and Topa, 2002; Pesaran et al., 2004).

In addition to the spatial econometrics method, standard econometrics offers estimation methods for controlling cross-sectional dependency. These include Parks' (1967) Feasible Generalized Least Squares (FGLS), Beck and Katz's (1995) Panel Corrected Standard Error (PCSE), Pesaran's (2006) Common Estimator of Correlated Effects (CCEE) and Hoechle's (2007) estimation technique. The latter is based on the non-parametric estimation technique of Driscoll and Kraay (1998). Although the estimation techniques of the latter two overcome the problem of cross-sectional dependence, they generally result in a misleading specification by considerably reducing the number of parameters to be estimated (Moundigbaye et al., 2018; Moundigbaye et al., 2020). Parks' (1967) FGLS and Beck and Katz's (1995) PCSE achieve the

same estimation objectives. Both estimation approaches consider cross-sectional dependence, heteroskedasticity and error autocorrelation (Reed and Ye, 2011; Moundigbaye et al., 2020).

However, the choice between the two estimation methods depends on the ratio between the temporal dimension (T) and the individual dimension (N) (Reed and Ye, 2011; Moundigbaye et al., 2018). When this ratio is less than one (1) (meaning T < N), the FGLS estimation strategy provides less reliable estimation results or is even infeasible due to the inability to calculate the inverse of the error variance-covariance matrix (Beck and Katz, 1995; Reed and Ye, 2011). However, when this ratio is greater than one (1) (i.e. N < T), the FGLS estimation strategy is preferred to PCSE as it produces more efficient estimators and remains better in terms of performance and accuracy than PCSE (Chen et al., 2010; Reed and Webb, 2010; Reed and Ye, 2011). Since our panel configuration is consistent with N < T, we perform our estimations using the FGLS estimation technique.

3.7 Results and discussions

3.7.1 Cross-correlation matrix

Table 3. 4: Cross-correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) LnSyn	1.000						
(2) LnFDI	0.1856***	1.000					
(3) LnINF	-0.032	0.106	1.000				
(4) LnTrade	0.127**	0.579***	0.074	1.000			
(5) LnINV	0.107	0.402***	-0.080	0.552***	1.000		
(6) LnGPOP	0.033	0.378***	-0.226***	0.427***	0.247***	1.000	
(7) LnMS	-0.094	-0.204***	0.064	-0.238***	-0.020	-0.343***	1.000

**** p<0.01. ** p<0.05. * p<0.1*

Source: Author's construction.

Table 3.4 shows the cross-correlation matrix between the dependent variable and the other variables in our model. Table 3.4 shows that business cycle synchronization is positive and statistically significant at the 1% level with foreign direct investment. It is also positive with trade openness, domestic investment and population growth rate. This reflects the positive effect of foreign direct investment on business cycle synchronization. Similarly, foreign direct investment is statistically significant: firstly, at the 1% level with trade openness, domestic investment, population growth rate and money supply.

3.7.2 Results of Pesaran dependency and unit root tests

This subsection presents Pesaran's cross-sectional dependence and unit root tests. Indeed, as indicated in the estimation technique above, we have used the Pesaran (2021) pre-estimation

test to diagnose cross-sectional dependence. The Pesaran test confirms the presence of cross-sectional dependence in the panel data. However, the cross-sectional dependence statistics (CD-statistics) for all variables used in our model are significant at the 1% level. This means that we reject the null hypothesis of cross-sectional independence between countries (see appendix A3.1). However, given that cross-sectional dependence is important in the data, we performed the unit root test using the Pesaran (2007) test, which is adapted to cross-sectional dependence. The results of our unit root tests indicate that the CIPS statistics calculated are statistically significant at the 1% level (see Appendix A3.2).

3.7.3 Effect of foreign direct investment on business cycle synchronization

3.7.3.1 The effect of FDI on business cycle synchronization in the presence of heteroscedasticity and autocorrelation

Looking at table 3.5 below, and in the presence of heteroskedasticity and autocorrelation, we can say that foreign direct investment exerts a positive and statistically significant effect on business cycle synchronization in CEMAC countries at the 5% threshold. This means that a 1% increase in FDI is associated with a 0.0698% increase in business cycle synchronization. This can be seen from the positive sign between the dependent and independent variables. This result highlights the potential of FDI to create intra-sectoral trade and closer integration of global value chains between countries in the CEMAC sub-region. However, it is important to note that the accumulation of foreign direct investment over time contributes to a closer synchronization of economic cycles. This is a strong argument in favor of the positive impact of capital mobility on business cycle correlation. Our results are in line with the work of authors such as Herrero and Ruiz (2008), Jansen and Stockman (2014), Borowski et al. (2020) and Stiblarova (2021), but contradict those of Asteriou and Moudatsou (2015) who found no significant impact of FDI on business cycles in wider Europe.

Furthermore, through this positive effect of foreign direct investment on business cycle synchronization, we can say that the value chains resulting from foreign direct investment and the specialization induced by risk sharing are the channels through which foreign direct investment affects the business cycle synchronization of CEMAC countries. From this perspective, economic shocks can proliferate through the prism of intra-industry trade and global value chains to all CEMAC countries along the chain. This means that foreign direct investment flows synchronize economic cycles, facilitating participation in the global value chain (GVC) and closer intra-industry trade integration in the Central African sub-region.

Overall, the results from the four capital flow channels suggest that capital mobility has a positive impact on business cycle synchronization in the CEMAC zone. Theoretical models of international business cycles predict the negative effects of financial integration (Ambler et al., 2004; Rothert 2020). However, empirical evidence has proven the impact of financial integration on business cycles (Kalemli-Ozcan et al., 2013). Therefore, the results of our study support existing empirical findings.

In contrast, the population growth rate (respectively money supply) exerts a negative but statistically significant effect at the 10% (respectively 5%) threshold on business cycle synchronization. This means that a 1% decrease in the population growth rate leads to a 0.261% (respectively 0.312%) drop in business cycle synchronization (columns 5 and 6). Like the population growth rate and money supply, inflation also exerts a negative and significant effect at the 10% threshold. Thus, a 1% drop in the inflation rate leads to a 0.212% reduction in business cycle synchronization. Furthermore, we can see that domestic investment is positive but not statistically significant with business cycle synchronization. The same applies to trade openness.

Table 3. 5: Effect of FDI on business cycle synchronization in the presence of heteroscedasticity and autocorrelation

VARIABLES	(1) LnSyn	(2) LnSyn	(3) LnSyn	(4) LnSyn	(5) LnSyn	(6) LnSyn
LnFDI	0.0698**	0.0789**	0.0755**	0.0944***	0.0815**	0.0818**
	(0.0293)	(0.0303)	(0.0316)	(0.0337)	(0.0367)	(0.0363)
LnINF		-0.141	-0.140	-0.207	-0.212*	-0.211*
		(0.120)	(0.121)	(0.127)	(0.127)	(0.126)
LnINV			0.0247	0.0348	0.00269	0.0397
			(0.0634)	(0.0634)	(0.0730)	(0.0743)
LnGPOP				-0.219	-0.261*	-0.330**
				(0.138)	(0.145)	(0.148)
LnTrade					0.132	0.0943
					(0.148)	(0.148)
LnMS						-0.312**
						(0.149)
Constant	2.250***	2.858***	2.792***	3.269***	2.866***	3.869***
	(0.0496)	(0.522)	(0.550)	(0.623)	(0.771)	(0.900)
Observations	162	162	162	162	162	162
R-squared	0.034	0.042	0.043	0.059	0.063	0.089

Standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

Source: Author's calculations, based on World Bank and World Outlook data.

3.7.3.2 Effect of FDI on business cycle synchronization in the absence of heteroscedasticity and autocorrelation

Whether or not heteroscedasticity and autocorrelation are present, we can see that FDI has a positive effect on business cycle synchronization in the CEMAC zone (see table 3.6 below). This positive effect is statistically significant at the 5% level. Indeed, in the absence of heteroscedasticity and autocorrelation, a 1% increase in foreign direct investment leads to a 0.0496% increase in business cycle synchronization. In other words, foreign direct investment increases business cycle synchronization in the CEMAC zone. The population growth rate, on the other hand, has a negative and statistically significant effect at the 5% level on business cycle synchronization in the CEMAC zone.

Although not significant, inflation and trade openness have a positive effect on business cycle synchronization in the CEMAC zone. Domestic investment and money supply, on the other hand, are insignificant and have a negative effect on business cycle synchronization.

In short, whether we are dealing with heteroscedasticity and autocorrelation or not, we can say that foreign direct investment has a positive effect on business cycle synchronization in CEMAC countries. The only difference we can observe is that in the presence of heteroscedasticity and autocorrelation, the degree of significance of the control variables is much higher than in the absence of heteroscedasticity and autocorrelation.

Table 3. 6: Effect of FDI on business cycle synchronization in the absence of heteroscedasticity and autocorrelation

VARIABLES	(1) LnSyn	(2) LnSyn	(3) LnSyn	(4) LnSyn	(5) LnSyn	(6) LnSyn
LnIDE	0.0496**	0.0507*	0.0549**	0.0662**	0.0503*	0.0564*
	(0.0247)	(0.0262)	(0.0274)	(0.0285)	(0.0304)	(0.0306)
LnINF		0.00801	0.00466	-0.0504	-0.0543	-0.0482
		(0.112)	(0.112)	(0.119)	(0.118)	(0.117)
LnINV			-0.0332	-0.0151	-0.0535	-0.0246
			(0.0651)	(0.0653)	(0.0712)	(0.0732)
LnGPOP				-0.186	-0.233*	-0.266**
				(0.116)	(0.120)	(0.123)
LnTrade					0.173	0.162
					(0.121)	(0.121)
LnMS						-0.208
						(0.137)
Constant	2.265***	2.228***	2.327***	2.699***	2.156***	2.718***
	(0.0379)	(0.490)	(0.523)	(0.581)	(0.683)	(0.762)
Observations	162	162	162	162	162	162

Number of Paysid	6	6	6	6	6	6

Standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

Source: Author's calculations, based on World Bank and World Outlook data.

3.7.4 Robustness

For the robustness test, we draw on the work of Giannone et al. (2010), Kalemli-Ozcan et al. (2013) and Zouri (2020). These authors use the absolute differential of countries' real GDP growth rates i and j (preceded by a negative sign) as an alternative measure of business cycle synchronization. Notwithstanding the advantages of the first measure of business cycle synchronization, it has a number of drawbacks, which are overcome by the second measure introduced in our work.

Indeed, the absolute differential measure has the advantage of considering the dynamic dispersion of the economic growth rate between countries (Kalemli-Ozcan et al., 2013). In addition, it takes into account the limitations of filter-cycle extraction methods, which are sensitive to weighting parameters (Cogley and Nason, 1995; Ravn and Uhlig, 2002). The absolute differential measure of business cycle synchronization is determined as follows:

$$Syn_{ijt} = -\left|tcr_{it} - tcr_{jt}\right| \quad (3)$$

Where tcr_{it} and tcr_{jt} respectively represent the real GDP growth rates of countries i and j at time t.

Thus, in view of tables A3.3 and A3.4 in the appendix, we can say that foreign direct investment has a positive and statistically significant effect on business cycle synchronization. Table A3.3 shows the positive effect of FDI on business cycle synchronization at the 5% threshold in the presence of autocorrelation and heteroscedasticity. This means that a 1% increase in FDI leads to an increase in cycle synchronization of 0.0602 percentage points. This corroborates the results obtained earlier. Table A3.4 shows the positive and significant effect of FDI at the 5% threshold on business cycle synchronization in the absence of autocorrelation and heteroscedasticity. Thus, a 1% increase in FDI translates into a 0.0618 percentage point increase in business cycle synchronization. The robustness results are in close agreement with those previously found.

Chapter conclusion

Business cycle models highlight the negative impact of financial integration on production correlations (Backus et al., 1992; Ambler et al., 2004; Rothert, 2020); empirical work by several authors shows that this relationship holds in the short term (Cerqueira and Martins, 2009; Monnet and Puy, 2016; Beck, 2019). The aim of this study was to analyze the effect of foreign direct investment on the synchronization of economic cycles and to identify the channels through which foreign investment affects the synchronization of economic cycles in the CEMAC zone. Closer integration of capital markets, including foreign direct investment, provides a basis for strong business cycle correlation.

The method we used to achieve our objective is the Feasible Generalized Least Squares (FGLS) method of Parks (1967). This method can only be used when the number of years is greater than the number of countries in the sample. Our results show, firstly, that foreign direct investment has a positive and statistically significant effect on the synchronization of business cycles in CEMAC countries; and secondly, that international value chains resulting from foreign direct investment, as well as risk-sharing-induced specialization, are the channels through which foreign direct investment affects the synchronization of business cycles in CEMAC countries.

Our results obtained above further corroborate our conclusion that foreign direct investment tends to substitute for trade when transportation costs are a problem. Given the strong growth in foreign direct investment over the last few decades, we have obtained a result that the impact of foreign investment in relation to cycle synchronization and trade is increasing, particularly when the source of disruption is industry-specific. An immediate implication of the evidence presented in this work is a call for more research efforts to integrate the role of foreign investment into macroeconomic modeling. Furthermore, in order to improve the synchronization of economic cycles in the CEMAC zone, governments must not only use the specialized channels induced by risk sharing to achieve the desired objectives. CEMAC governments also need to adopt "sensible policies" to improve foreign direct investment flows, both in terms of regulation and practice.

GENERAL CONCLUSION

The main objective of this study was to analyze the effects of capital flows on the economic cycles of CEMAC countries. Three forms of capital flows are considered in this study: remittances, official development assistance and foreign direct investment.

The aim of our first essay was to examine the effects of remittances on fluctuations in economic activity in CEMAC countries. The methodology used in this first chapter was the PVECM. The use of this VECM method on panel data is justified by the fact that it imposes no a priori restrictions on the exogeneity and endogeneity of the variables. This method combines both unobserved individual heterogeneities between the countries in the sample (Love and Zicchino, 2006). The results of this first chapter show that remittances have a direct influence on fluctuations in economic activity in CEMAC countries. On the other hand, remittances play a stabilizing role insofar as they are counter-cyclical to fluctuations in per capita output. With reference to the literature, this suggests an altruistic motivation. This research also shows that remittances, while interacting with other variables, can play a key role in mitigating the impact of negative shocks on output.

Notwithstanding the fact that remittances help to bridge current account deficits, they are also a source of upward pressure on inflation and the real effective exchange rate between member countries. Moreover, our results also show that there is a one-way relationship between remittances and fluctuations in economic activity, from remittances to fluctuations in economic activity. As an economic policy suggestion, it would make sense for CEMAC countries to reduce remittance costs and increase transparency in remittance service conditions. Policies to promote the development of the financial sector, such as encouraging competition between banks and benefiting other providers such as microfinance organizations, credit unions and postal savings banks, can have a beneficial impact on the remittance market.

The aim of the second essay is to analyze the effects of official development assistance on the oscillations of countries in the CEMAC zone. To achieve this objective, we used the Auto Regressive Distributed Lag model (ARDL) as our analysis method. This method follows the F distribution of Narayan and Narayan (2005). The advantage of using this method is that it is more appropriate for testing the existence of long-run relationships in small sample sizes, and unlike the approach of Johansen and Juselius (1990), the ARDL method enables them to be tested on variables with different orders of integration. What's more, this approach takes into account the dynamic nature of the panel and has the advantage of simultaneously obtaining the

short-term and long-term equations, and of taking into account both country heterogeneity and series dynamics, unlike the traditional panel.

The results of this second chapter show, using the Kao (1999) cointegration test, that all the variables in the model are cointegrated. Furthermore, our results show that, in the short term, public development aid, in addition to having a negative effect, has no significant effect on the output gap of CEMAC countries. On the other hand, official development assistance, in addition to having a positive and statistically significant long-term influence on the output gap, is procyclical. The significance of ODA on the output gap remains non-negligible. This result is closely in line with a large number of studies in the literature asserting that the presence of ODA stimulates growth in recipient countries. Furthermore, using Toda and Yamamoto's (1995) causality test, we were able to observe that there is a causal relationship between ODA and the business cycle, running from ODA to the cycle. Thus, ODA channeled to CEMAC countries proves vital to the economic development of countries in the sub-region. As implications in the face of such results, we suggest that in order to control the economic cycle of CEMAC countries as well as an external economic transition, governments should strive to set up appropriate policies. Indeed, it makes sense to set up an appropriate tax system to control donor aid.

In the third chapter, we analyzed the effects of foreign direct investment on the synchronization of economic cycles in the countries of the Economic and Monetary Community of Central African States. This objective was achieved using Parks' (1967) Generalized Feasible Least Squares (FGLS) method. The use of this method is required when the number of countries is less than the number of years (N<T). In this case, the FGLS method produces more efficient estimators and remains better in terms of performance and accuracy (Chen et al., 2010; Reed and Ye, 2011). This estimation approach considers cross-sectional dependence, heteroscedasticity and error autocorrelation (Reed and Ye, 2011; Moundigbaye et al., 2020). The results of this third chapter attest, firstly, that foreign direct investment has a positive and statistically significant effect on the synchronization of business cycles in CEMAC countries; and secondly, that international value chains resulting from foreign direct investment, as well as risk-sharing-induced specialization, are the channels through which foreign direct investment affects the synchronization of business cycles in CEMAC countries. An immediate implication of the evidence presented in this work is a call for more research efforts to integrate the role of foreign investment into macroeconomic modeling. Furthermore, governments in the CEMAC

sub-region need to adopt “appropriate policies” to improve FDI flows, both in terms of regulation and practice.

Despite the robustness tests carried out on the various empirical results obtained in the course of writing this thesis, we must point out that there are a number of limitations that need to be overcome. The first of these is the non-inclusion of certain variables, in this case institutional variables, due to the unavailability of data on these variables over a long study period for some of the countries in our sample. A second limitation of this thesis lies in the geographical area studied. Indeed, the study of economic cycles is mostly carried out in economic communities with a single currency. However, it must be emphasized that these various limitations do not call into question the reliability of this thesis work, which is of capital importance for the CEMAC countries. Moreover, the above-mentioned limitations in no way detract from the theoretical and empirical significance of this study, insofar as any empirical work is not immune to the difficulties inherent in the construction of econometric models, which are recognized at least implicitly by all the authors.

However, this thesis does highlight a few prospects for future research. Thus, in order to further enrich the economic literature on the effects of capital flows on business cycles in the CEMAC zone, future work would need to take into account other forms of capital besides those studied in this study. In addition, an individual analysis could be extended by modelling a form of two-way game, i.e. within a country and between countries. Such an analysis would make it easier to identify the strategic interactions between different forms of capital flow. Similarly, the integration of other variables into our conceptual models: a future path would be to enrich the conceptual models by integrating explanatory variables on the one hand, and control variables on the other.

REFERENCES

Abderahmane, A., & Cuhal, R. (2011). La stabilité macroéconomique et la libéralisation du commerce des services bancaires et financiers. *Anuar Ştiinţific al Institutului de Relaţii Internaţionale* (9), 104–112.

Abdih, Y., Chami, R., Dagher, J. & Montiel, P. (2012). "Remittances and Institutions: Are Remittances a Curse?" *World Development* 40 (4), 657–66.

Abdih, Y., Chami, R., Dagher, J., & Montiel, P. (2008). « Remittances and Institutions: Are Remittances a Curse? » Document de travail du FMI 08/29, *Fonds Monétaire International*, Washington.

Abiad, A., Furceri, D., Kalemli-Ozcan, S., & Pescatori. A. (2013). "Dancing Together? Spillovers, Common Shocks, and the Role of Financial and Trade Linkages." In *World Economic Outlook*, 81–111. Washington, DC: International Monetary Fund.

Abraham-Frois, G. (1999). *« Les fluctuations économiques : analyses contemporaines ». Economica*.

Abraham-Frois. G et Berrebi. (1995). « Cycle, instabilité et chaos », *Economica*, paris.

Abrigo, M. R., & Love, I. (2016). Estimation of panel vector autoregression in Stata. *The Stata Journal*, *16*(3), 778-804.

Acemoglu, D., & Zilibotti, F. (1997). Was prometheus unbound by chance ? risk, diversification and growth. *Journal of political economy*, 105(4), 709–751.

Acosta, P., Fajnzylber, P., & Lopez, J. H. (2007). *The impact of remittances on poverty and human capital: evidence from Latin American household surveys* (Vol. 4247). World Bank Publications.

Acosta, P., Lartey, E., & Mandelman, F. (2009). "Remittances and the Dutch Disease." *Journal of International Economics* 79 (1): 102–16.

Adams Jr, R. H. (2004). Remittances and poverty in Guatemala. In International Migration, Remittances and the Brain Drain, *World Bank Publications*, 53–80.

Adams R. H., & Page, J. (2005). "Do international migration and remittances reduce poverty in developing countries?". *World Development*, 33 (10), 1645-1669.

Adams, R. H. (2006b). "International Remittances and the Household: Analysis and Review of Global Evidence". *Journal of African Economies*, 15 (2): 396-425.

Adams, R. H. (2009). "The Determinants of International Remittances in Developing Countries." *World Development* 37 (1), 93–103.

Adams, R. H., & Page, J. (2003). *International migration, remittances, and poverty in*

developing countries (Vol. 3179). World Bank Publications.

Adedokun, A. J., Folawewo, A. O., & Abiodun, O. (2017). Aid selectivity practice and aid effectiveness in Sub-Saharan Africa. *Review of Innovation and Competitiveness: A Journal of Economic and Social Research*, *3*(2), 43-64.

Agarwal, R., & Horowitz, A. W. (2002). "Are International Remittances Altruism or Insurance? Evidence from Guyana Using Multiple-Migrant Households." *World Development* 30 (11): 2033–44.

Agénor, P. R., & Aizenman, J. (2010). Aid volatility and poverty traps. *Journal of Development Economics*, *91*(1), 1-7.

Agénor, P., McDermott, C. J., & Eswar, S. P. (2000). "Macroeconomic Fluctuations in Developing Countries: Some Stylized Facts." *IMF Working Paper*.

Aggarwal, R., Demirgüç-Kunt, A., & Peria, A. S. M. (2006). "Do Workers' Remittances Promote Financial Development?" Document de travail pour la recherche sur les politiques 3957, *Banque Mondiale*, Washington.

Aghoutane, K., & Karim, M. (2017). The impact of foreign aid on economic growth in Morocco: econometric analysis using VECM. *International Journal of Economics and Finance*, *9*(5), 87.

Aiolfi, M., Catão, L. A.V., & Timmerman, A. (2006). "Common Factors in Latin America's Business Cycles", *International Monetary Fund, Working Paper 06/49, Washington.*

Akın, Ç. (2012). Multiple determinants of business cycle synchronization. *Available at SSRN 1022648*.

Akinlo, A. E., & Egbetunde, T. (2010). "Financial Development and Economic Growth: The Experience of 10 Sub-Saharan African Countries Revisited." *Review of Finance and Banking* 2 (1): 17–28.

Akkoyunlu, S. & Kholodilin, K. A. (2006). "What Affects the Remittances of Turkish Workers: Turkish or German Output?". *Discussion Papers of DIW Berlin 622*, DIW Berlin, German Institute for Economic Research.

Akkoyunlu, S., & Kholodilin, K. A. (2008). "A Link between Workers' Remittances and Business Cycles in Germany and Turkey." *Emerging Markets Finance and Trade* 44 (5): 23–40.

Alemu, A. M., & Lee, J. S. (2015). Foreign aid on economic growth in Africa: a comparison of low and middle-income countries. *South African Journal of Economic and Management Sciences*, *18*(4), 449-462.

Allen, F., & Giovannetti, G. (2009, June). Fragile countries and the current economic crisis. In *Conference on "Moving towards the European Report on Development*.

Altonji, J. G., & Ham, J. C. (1990). Variation in employment growth in Canada: The role of external, national, regional, and industrial factors. *Journal of Labor Economics*, *8*(1, Part 2), S198-S236.

Ambler, S., Cardia, E., & Zimmermann, C. (2004). International business cycles: What are the facts?. *Journal of monetary economics*, *51*(2), 257-276.

Amuedo-Dorantes, C., & Pozo, S. (2006). Migration, envois de fonds et modèles d'emploi des hommes et des femmes. *American Economic Review*, *96* (2), 222-226.

An, J., Kim, K., & Pyun, J. H. (2021). Does debt market integration amplify the international transmission of business cycles during financial crises?. *Journal of International Money and Finance*, *115*, 102396.

Andersen, J. J., Johannesen, N., & Rijkers, B. (2022). Elite capture of foreign aid: Evidence from offshore bank accounts. *Journal of Political Economy*, *130*(2), 388-425.

Anselin, L. (2013). *Spatial Econometrics: Methods and Models*. Heidelberg: Springer Science & Business Media.

Antonakakis, N., & Scharler, J. (2012). The synchronization of GDP growth in the G7 during US recessions. *Applied Economics Letters*, *19*(1), 7-11.

Antonakakis, N., & Tondl, G. (2014). Does integration and economic policy coordination promote business cycle synchronization in the EU?. *Empirica*, *41*(3), 541-575.

Anyanwu, J. C. & Erhijakpor, A. E. O. (2010). "Do International Remittances Affect Poverty in Africa?" *African Development Review* 22 (1): 51–91.

Arawomo, D. F., Badejo, A. A., & Oshota, O. S. (2015). Complementarity of Foreign Aid and Domestic Savings as Drivers of Economic Growth: Evidence from WAMZ1 Countries. *Journal of Economics and Business Research*, *21*(2), 159-171.

Arellano, C., Bulíř, A., Lane, T., & Lipschitz, L. (2009). The dynamic implications of foreign aid and its variability. *Journal of Development Economics*, *88*(1), 87-102.

Arezki, R., & Brückner, M. (2012). Rainfall, financial development, and remittances: Evidence from Sub-Saharan Africa. *Journal of International Economics*, *87*(2), 377-385.

Arkolakis, C., & Ramanarayanan, A. (2009). Vertical specialization and international business cycle synchronization. *The Scandinavian Journal of Economics*, *111*(4), 655-680.

Arndt, C., Jones, S., & Tarp, F. (2015). Assessing foreign aid's long-run contribution to growth and development. *World Development*, *69*, 6-18.

Arora, Vivek, & Vamvakidis, A. (2004). « The Impact of U.S. Economic Growth on the Rest of the World: How Much Does It Matter? » *Journal of Economic Integration* 19 (1): 1‑18.

Artis, M. J., Fidrmuc, J., & Scharler, J. (2008). The transmission of business cycles Implications for EMU enlargement 1. *Economics of Transition*, *16*(3), 559-582.

Artis, M., & Okubo. T. (2009). « Globalization and Business Cycle Transmission ». *The North American Journal of Economics and Finance* 20, n° 2 (août 2009), 91‑99.

Artis, M., Krolzig, H. M., & Toro, J. (2004). The European business cycle. *Oxford Economic Papers*, *56*(1), 1-44.

Askarov, Z., & Doucouliagos, H. (2015). Development aid and growth in transition countries. *World Development*, *66*, 383-399.

Asteriou, D., & Moudatsou, A. (2015). "Business Cycle Synchronization in the Enlarged EU: The Role of Bilateral Trade and FDI." *Review of Development Economics* 19 (1): 196–207.

Avendaño, R., Gaillard, N., & Nieto-Parra, S. (2009). "Are Workers' Remittances Relevant for Credit Rating Agencies?" Document de travail du Centre du développement de l'OCDE 282, Organisation de coopération et de développement économiques, Paris.

Aydas, O.T., Neyapti, B., & Metin-Ozcan, K. (2005). "Determinants of Workers' Remittances: The Case of Turkey". *Emerging Markets Finance and Trade*, M.E. Sharpe, Inc, 41(3): 53-69.

Azam, M., & Feng, Y. (2022). Does foreign aid stimulate economic growth in developing countries? Further evidence in both aggregate and disaggregated samples. *Quality & Quantity*, 56(2), 533-556.

Bacchetta, P., Davenport, M., & Van Wincoop, E. (2022). Can sticky portfolios explain international capital flows and asset prices?. *Journal of International Economics*, *136*, 103583.

Backus, D. K., Kehoe, P. J., & Kydland, F. E. (1992). International real business cycles. *The Journal of Political Economy*, *100*(4), 745–775.

BAD. (2007). « Les transferts de fonds des migrants, un enjeu de développement. Comores, Mali, Maroc, Sénégal ». *Rapport de la BAD*, Tunis.

Baele, L., Ferrando, A., Hördahl, P., Krylova, E., & Monnet, C. (2004). Measuring European financial integration. *Oxford review of economic policy*, *20*(4), 509-530.

Banque Mondiale & Nations Unies (2006). Measuring Progress in the LDCs: A Statistical

Profile. UN-OHRLLS and World Bank.

Banque Mondiale. (2006). Global Economic Prospects 2006: Economic Implications of Remittances and Migration. Washington, DC.

Banque Mondiale. (2007). Report on General Principles for International Remittances. Washington : Banque Mondiale.

Banque Mondiale. (2011). Recueil de statistiques 2011 sur les migrations et les envois de fonds, Washington DC, http://www.worldbank.org/prospects:migrationanddremittances, 15 novembre 2012.

Banque Mondiale. (2019). Leveraging Economic Migration for Development: A Briefing for the World Bank Board (English). Washington, D.C.: *World Bank* Group.

Banque Mondiale. (2021). Migration and Development Brief 34: COVID-19 Crisis Through a Migration Lens, World Bank, available online at https://www.knomad.org/publication/migration-and-development-brief-34.

Barajas, A., Chami, R., Ebeke, C. & Tapsoba, S. J.-A. (2012). "Workers' Remittances: An Overlooked Channel of International Business Cycle Transmission?" IMF Working Papers 12/251, *International Monetary Fund*.

Barajas, A., Chami, R., Fullenkamp, C. & Garg, A. (2010). "The Global Financial Crisis and Workers' Remittances to Africa: What's the Damage?" *Journal of African Development* 12 (1), 73–96.

Barajas, A., Chami, R., Fullenkamp, C., Gapen, M., & Montiel, P. (2009). Do workers' remittances promote economic growth? *IMF Working Paper*, WP 09 153.

Barattieri, A., Cacciatore, M. & Ghironi, F. (2021), "Protectionism and the Business Cycle", *Journal of International Economics* 129:103417.

Basu, S., & Taylor, A. (1999). Business Cycles in International Historical Perspective. *Journal of Economic Perspective* 13, 45-68.

Bataka, H., & Maï Assan Chedi, M. (2022). Globalization and business cycles synchronization in sub-Saharan Africa. *The Journal of International Trade & Economic Development*, 1‑25.

Batu, M. (2017). International worker remittances and economic growth in a Real Business Cycle framework. *Structural Change and Economic Dynamics*, *40*, 81‑91.

Bauer, P. T. (1971). *Foreign Aid*. Encounter.

Bawa, S. & Abdullahi, I. S. (2012). "Threshold Effect of Inflation on Economic Growth in Nigeria." *CBN Journal of Applied Statistics* 3(1):43–63.

Baxter, M., & Crucini, M. J. (1995). Business cycles and the structure of asset trade. *International Economic Review*, *36*(4), 821–854.

Baxter, M., & King, R. G. (1999). "Measuring business cycles: approximate band-pass filters for economic time series." *Review of economics and statistics*, *81*(4), 575-593.

Baxter, M., & Kouparitsas, M. A. (2005). Determinants of business cycle comovement: a robust analysis. *Journal of Monetary Economics*, *52*(1), 113-157.

Bazonzi, J. M. (2014). Diaspora et développement. *Babacar Ndione (Éd.), L'Afrique centrale face aux défis migratoires, Bruxelles, ACP Migration, juin*, 13-31.

Bazzi, S., & Clemens, M. (2013). "Blunt Instruments: Avoiding Common Pitfalls in Identifying the Causes of Economic Growth." *American Economic Journal: Macroeconomics* 5 (2), 152–86.

Beck, K. (2013a). Structural similarity as a determinant of business cycle synchronization in the European Union: A robust analysis. *Research in Economics and Business: Central and Eastern Europe*, 5(2), 31–54.

Beck, K. (2013b). Determinants of business cycles synchronization in the European Union and the Euro area. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 8(4), 25–48.

Beck, K. (2019). What drives business cycle synchronization? BMA results from the European Union. *Baltic Journal of Economics*, *19*(2), 248–275.

Beck, K., & Stanek, P. (2019). Globalization or regionalization of stock markets? The Case of central and eastern European countries. *Eastern European Economics*, *57*(4), 317-330.

Beck, N., & Katz, J. N. (1995). "What to Do (and not to Do) with Time-Series Cross-Section Data." *American Political Science Review* 89 (3): 634–647.

Beetsma, R., & Giuliodori, M. (2011). "The effects of government purchases shocks: Review and estimates for the EU." *The Economic Journal*. 121(550), F4-F32.

Belke, A., Domnick, C., & Gros, D. (2017). Business cycle synchronization in the EMU: Core vs. periphery. *Open Economies Review*, *28*(5), 863-892.

Bertoli, S., Cornia, G. A., & Manaresi, F. (2008). "Aid performance and its determinants: A comparison of Italy with the OECD norm," University of Florence Department of Economics *Working Paper* No. 11 (Florence: University of Florence).

Bettin, G., A. Presbitero, & Spatafora, N. (2015). "Remittances and Vulnerability in Developing Countries." *World Bank Economic Review* September 29, 1–29.

Bettin, G., Lucchetti, R., & Zazzaro, A. (2012). "Endogeneity and Sample Selection in a Model

for Remittances." *Journal of Development Economics* 99 (2): 370–84.

Bhagwati, J. (1976). "The International Brain Drain and Taxation. A Survey of the Issues". *In The Brain Drain and Taxation. Theory and Empirical Analysis*, ed. J. Bhagwati. Amsterdam: North Holland.

Billmeier, A. & Massa, I. (2009). "What Drives Stock Market Development in Emerging Markets—Institutions, Remittances, or Natural Resources?" *Emerging Markets Review* 10 (2): 23–35.

Blomström, M., & Kokko, A. (1997). *How Foreingn Investment Affects Hose Countries* (No. 1745). World Bank Publications.

Blouchoutzi, A. & Nikas, C. (2010). *"The Macroeconomic Implications of Emigrants' Remittances in Romania, Bulgaria and Albania". Post-Communist Economies Vol. 22, N° 4, December 2010, 547–558.*

Boateng, E., Agbola, F. W., & Mahmood, A. (2021). Foreign aid volatility and economic growth in Sub-Saharan Africa: Does institutional quality matter?. *Economic Modelling*, *96*, 111-127.

Bollard, A., McKenzie, D & Morten, M. (2010). "The Remitting Patterns of African Migrants in the OECD." *Journal of African Economies* 19 (5): 605–34.

Boone, L., Giorno, C., & Richardson, P. (1998). Stock market fluctuations and consumption behaviour: some recent evidence.

Boone, P. (1996). Politics and effectiveness of foreign aid. *European Economic Review*. 40 (2), 289–329.

Bordo, M.D., Eichengreen, B., & Kim, J. (1998). Was There Really an Earlier Period of International Financial Integration Comparable to Today? Working Paper 6738. *National Bureau of Economic Research*, Cambridge, Mass.

Borensztein, E., Cowan, K. & Valenzuela, P. (2007). "Sovereign Ceilings 'Lite'? The Impact of Sovereign Ratings on Corporate Ratings in Emerging Market Economies." Document de travail du FMI 07/75, *Fonds Monétaire International*, Washington.

Borensztein, E., Gregorio, J. D., & Lee, J. W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economic*, 45, 115–135.

Borjas, G.J. (1987). "Self-Selection and the Earnings of Immigrants". *American Economic Review*, 77(4): 531-53.

Borowski, J., Czerniak, A., Boratyński, J., & Rosati, D. (2020). Foreign bank ownership and business cycle synchronization in the European Union. *Argumenta Oeconomica*, *1*(44),

19–46.

Bourdet, Y., & Falck, H. (2006). "Emigrants' Remittances and Dutch Disease in Cape Verde." *International Economic Journal* 20 (3): 267–84.

Böwer, U., & Guillemineau, C. (2006). Determinants of business cycles synchronization Across Euro area countries. *EBC Working Papers*, 587.

Boyce, J., & Ndikumana, L. (2001). Is Africa a Net Creditor? New Estimates of Capital Flight from Severely Indebted Sub-Saharan African Countries, 1970-1996. *Journal of Development Studies*, 38, 27-56.

Bräuning, F., & Sheremirov, V. (2021). *The transmission mechanisms of international business cycles: Output spillovers through trade and financial linkages* (No. 21-13). Working Papers.

Bräuning, F., & Sheremirov, V. (2022). The Transmission Mechanisms of International Business Cycles: International Trade and the Foreign Effects of US Monetary Policy. *IMF Economic Review*, 1-26.

Broner, F., & Rigobon, R. (2004). Why are capital flows so much more volatile in emerging than in developed countries?. *Available at SSRN 884381*.

Broner, F., Didier, T., Erce, A., & Schmukler, S. L. (2013). Gross capital flows: Dynamics and crises. *Journal of Monetary Economics 60* (1), 113{133}.

Broto, C., Díaz-Cassou, J., & Erce, A. (2011). Measuring and explaining the volatility of capital flows to emerging countries. *Journal of banking & Finance*, *35*(8), 1941-1953.

Brown, R. P. C. (1997). "Estimating Remittance Function for Pacific Island Migrants". *World Development*, 25(4): 613-626.

Buch, C. M. & Kuckulenz, A. (2004). "Worker Remittances and Capital Flows to Developing Countries". *ZEW – Centre for European Economic Research, Discussion Paper,* 04-031.

Budd, J. W., Konings, J., & Slaughter, M. J. (2005). Wages and international rent sharing in multinational firms. *The Review of Economics and Statistics*, 73-84.

Bugamelli, M., & Paterno, F. (2011). "Output Growth Volatility and Remittances." *Economica* 78 (311): 480–500.

Bulíř, A., & Hamann, A. J. (2003). Aid volatility: an empirical assessment. *IMF Staff papers*, 50(1), 64-89.

Burger, M. J., & Ianchovichina, E. I. (2014). Surges and stops in FDI flows to developing countries: Does the mode of entry make a difference? *Policy Research Working Paper*

No.6771. World Bank, Washington, D.C., USA.

Burnside, C. & Dollar, D. (2000). "Aid, policies, and growth," *American Economic Review*, Vol. 90, Issue 4, pp. 847–868.

Busl, C., & Kappler, M. (2013). *Does foreign direct investment synchronise business cycles ? results from a panel approach* (Rapport technique). WWW for Europe working paper.

Bussolo, M., & Medvedev, D. (2007). "Do Remittances Have a Flip Side? A General Equilibrium Analysis of Remittances, Labor Supply Responses and Policy Options for Jamaica." Document de travail pour la recherche sur les politiques 4143, Banque Mondiale, Washington.

Caballero, R. J., & Simsek, A. (2020). A model of fickle capital flows and retrenchment. *Journal of Political Economy*, *128*(6), 2288-2328.

Calderón, C., & Kubota, M. (2014). Ride the wild surf: an investigation of the drivers of surges in capital inflows. *World Bank Policy Research Working Paper* No. 6753. World Bank, Washington, D.C., USA.

Calderón, C., & Schmidt-Hebbel, K. (2008). Business cycles and fiscal policies: The role of institutions and financial markets. Documentos de Trabajo (Banco Central de Chile) (481), 1.

Calderon, C., Chong, A. & Stein, E. (2007). "Trade intensity and business cycle synchronization: Are developing countries any different?", *Journal of International Economics*, 71(1), pp. 2–21.

Calderon, C., Kambou, G., Korman, V., Kubota, M., & Cantu Canales, C. (2019). Africa's pulse, volume. 19, avril 2019 : Une analyse des enjeux façonnant l'avenir économique de l'afrique. *The World Bank*.

Calvo, G. A. (1998). Capital flows and capital-market crises: The simple economics of sudden stops. *Journal of Applied Economics*, *1*(1), 35-54.

Calvo, G., & Mendoza, E. (2000). Rational contagion and the globalization of securities markets. *Journal of International Economics*, *51*, 79–113.

Carmignani, F. (2010). Endogenous optimal currency areas: The case of the central African economic and monetary community. *Journal of African Economies*, *19*(1), 25–51.

Catrinescu, N., Leon-Ledesma, M., Piracha, M., & Quillin, B. (2009). "Remittances, Institutions et Economic Growth." *World Development* 37 (1): 81–92.

CEEAC. (2009). Annuaire statistique du commerce des etats de l'afrique centrale. *Les Editions CLE*.

Cerqueira, P. A., & Martins, R. (2009). "Measuring the Determinants of Business Cycle Synchronization Using a Panel Approach." *Economics Letters* 102 (2): 106–108.

Cesa-Bianchi, A., Imbs, J., & Saleheen, J. (2019). "Finance and Synchronization." *Journal of International Economics* 116: 74–87.

Chami, R., Barajas, A., Cosimano, T., Fullenkamp, C., Gapen, M., & Montiel, P. (2008). "Macroeconomic Consequences of Remittances." IMF Occasional Paper 259, *International Monetary Fund* Washington.

Chami, R., D. Hakura, & Montiel, P. (2012). "Do Worker Remittances Reduce Output Volatility in Developing Countries?" *Journal of Globalization and Development* 3 (1): 1–25.

Chami, R., Fullenkamp , C. & Jahjah, S. (2003). "Are Immigrant Remittances Flows a Source of Capital for Development?". *IMF Staff papers*, International Monetary Fund, (52): 55-81.

Chami, R., Hakura, D., & Montiel, P. (2009). « Remittances: An Automatic Stabilizer? » Document de travail du FMI 09/91, *Fonds Monétaire International*, Washington.

Chami, R., Jahjah, S., & Fullenkamp, C. (2005). "Are Immigrant Remittance Flows a Source of Capital for Development?" *IMF Staff Papers* 1 (52): 55–81.

Chen, X., Lin, S., & Reed, W. R. (2010). "A Monte Carlo Evaluation of the Efficiency of the PCSE Estimator." *Applied Economics Letters* 17 (1): 7–10.

Chenery, H. B. & Alan, M. S. (1966). Foreign assistance and economic development. *The American Economic Review*, LVI(4).

Chinn, M. D., & Ito, H. (2006). What matters for financial development ? capital controls, institutions, and interactions. *Journal of Development Economics*, 81(1), 163–192.

Christiano, L. J., & Fitzgerald, T. J. (2003). "The band pass filter." *international economic review*, *44*(2), 435-465.

Chude, D. I., & Chude, N. P. (2015). "Impact of Inflation on Economic Growth in Nigeria (2000–2009)." *International Journal of Business and Management Review* 3(5):26–34.

Chudik, A., & Pesaran, M. H. (2015). "Common Correlated Effects Estimation of Heterogeneous Dynamic Panel Data Models with Weakly Exogenous Regressors." *Journal of Econometrics* 188 (2): 393–420.

Claessens, S., D. Cassimon, & Van Campenhout, B. (2009). "Evidence on Changes in Aid Allocation Criteria", *The World Bank Economic Review*, 23(2), 185-208.

Clark, T. (1998). "Employment fluctuations in U.S. regions and industries: The roles of

national, region specific, and industry specific shocks", *Journal of Labor Economics*, Vol. 16, p. 202-219.

Clarke, G., & Wallsten, S. (2004). "Do Remittances Protect Household in Developing Countries against Shocks? Evidence from a Natural Disaster in Jamaica." Banque mondiale, Groupe de recherche pour le développement, Washington.

Clemens, M. A., & McKenzie, D. (2018). Why Don't Remittances Appear to Affect Growth? *The Economic Journal*, *128*(612), F179‐F209.

Clemens, M. A., R, S., Bhavnani, R. R. & Bazzi, S. (2012). Counting Chickens when they hatch: timing and the effect of aid on growth. *The Economic Journal*, 122, June, pp. 590-617.

CNUCED (2018). "Investment and New Industrial Policies" *World Investment Report*.

CNUCED (2020). International Production Beyond the Pandemic. *World Investment Report*.

CNUCED (2021). Investing in Sustainable Recovery. *World Investment Report*.

CNUCED. (2019). *Rapport sur le développement économique en afrique 2019 : made in africa, les règles d'origine, un tremplin pour le commerce intra-africain*.

Cogley, T., & Nason, J. M. (1995). "Effects of the Hodrick-Prescott Filter on Trend and Difference Stationary Time Series Implications for Business Cycle Research." *Journal of Economic Dynamics and Control* 19 (1–2): 253–278.

Coiffard, M. (2012). La coopération internationale sur les transferts de fonds des migrants, quels enjeux pour quelle perspective ? *Revue européenne des migrations internationales*, *28*(1), 129‐145.

Collier, P. & Hoeffler, A. (2004). Aid, policy and growth in post-conflict societies. *European Economic Review*, *48*(5), pp.1125-1145.

Collier, P., & Dollar, D. (2002). "Aid allocation and poverty reduction". *European Economic Review*, *46*(8), 1475-1500.

Combes, J.-L., Ebeke, C., Etoundi, M. N., & Yogo, T. (2014). "Are Foreign Aid and Remittance Inflows a Hedge against Food Price Shocks in Developing Countries?" *World Development* 54 (1): 81–98.

Conley, T. G., & Topa, G. (2002). "Socio-Economic Distance and Spatial Patterns in Unemployment." *Journal of Applied Econometrics* 17 (4): 303–327.

Cooray, A., & Mallick, D. (2013). "International Business Cycles and Remittance Flows." *The B.E. Journal of Macroeconomics* 13 (1): 1–33.

Corrado, L., & Fingleton, B. (2012). "Where Is the Economics in Spatial Econometrics?"

Journal of Regional Science 52 (2): 210–239.

Craigwell, R., M. Jackman, & Moore, W. (2010). "Economic Volatility and Remittances." *International Journal of Development Issues* 9 (1): 25–42.

Crosby, M. (2003). Business cycle correlations in Asia–Pacific. *Economics Letters*. 80, 35–44.

Crucini, M. J., Kose, M. A., & Otrok, C. (2011). "What are the driving forces of international business cycles?", *Review of Economic Dynamics*, 14(1), pp. 156– 175.

Dabla-Norris, E., Minoiu, C., & Zanna, L. F. (2015). Business cycle fluctuations, large macroeconomic shocks, and development aid. *World Development*, 69, 44-61.

Dagher., & Jihad, C. (2010). Sudden stops, output drops, and credit collapses. IMF Working Paper No. 10/176. *International Monetary Fund*, Washington, D.C.

Dalgaard, C. J. (2005). "Donor Policies and Aid Effectiveness", *University of Copenhagen and EPRU*.

Davis, J. S. (2014). "Financial Integration and International Business Cycle CoMovement." *Journal of Monetary Economics* 64 (May): 99–111.

Davis, S. (2009). *Financial integration and international business cycle co-movement: The role of financial sector risk*. Thèse de doctorat non publiée, PhD dissertation, Vanderbilt.

De Bruyn, T. & Wets, J. (2004). *Remittances in the Great Lakes Region*, International Organization for Migration.

De la Briere, B., Sadoulet, E., De Janvry, A., & Lambert, S. (2002). "The Roles of Destination, Gender, and Household Composition in Explaining Remittances: An Analysis for the Dominican Sierra." *Journal of Development Economics* 68, 309–328.

De, S., Islamaj, E., Kose, A., & Yousefi, R. (2016). Remittances over the Business Cycle : Theory and Evidence. *Centre for Applied Macroeconomic Analysis*, 35.

Deeatripont, M. & Seabright, P. (2006). "Wasteful" public spending and the state aid control", *Journal of the European Economic Association*. 4/2-3.

Dées, S., & Zorell, N. (2012). Business cycle synchronisation: Disentangling trade and financial linkages. *Open Economies Review*, *23*, 623–643.

Defoort, C. (2007). *Migrations qualifiées et capital humain : nouveaux enseignements tires d'une base de données en panel*. Thèse de doctorat en sciences économiques, Université de Lille 2, 23 novembre.

Desai, M. A., Foley, C. F., Campa, J. M., & Pappa, E. (2004, January). The Comovement of Returns and Investment within the Multinational Firm [with Comments]. In *NBER International Seminar on Macroeconomics* (Vol. 2004, No. 1, pp. 197-237). Chicago,

IL: The University of Chicago Press.

Devereux, M. B., & Yetman, J. (2010). Leverage constraints and the international transmission of shocks. *Journal of Money, Credit and Banking*, *42*, 71–105.

Di Giovanni, J., & Levchenko, A. A. (2010). Putting the parts together: trade, vertical linkages, and business cycle comovement. *American Economic Journal: Macroeconomics*, *2*(2), 95-124.

Dickey, D.A. & Fuller, W.A. (1979), "Distribution of the Estimators for Autoregressive Time Series with a Unit Root", *Journal of the American Statistical Association*, 74, 417-31.

Dickey, D.A. & Fuller, W.A. (1981), "Likelihood Ratio Statistics for AutoRegressive Time Series with a Unit Root", *Econometrica*, 49, 1057-1072.

Diebold, F., & Rudebusch, G. (2021). "Measuring Business Cycles: A Modern Perspective." In *Business Cycles: Durations, Dynamics, and Forecasting*, edited by F. Diebold and G. Rudebusch, 117–143. Princeton, NJ: Princeton University Press.

Dinh, S. T., & Nguyen, P. C. (2020). Foreign financial flows, human capital and economic growth in African developing countries. *International Journal of Finance Economics*.

Docquier, F. & Marfouk, A. (2004): "Measuring the International Mobility of Skilled Workers— Release 1.0.", *Policy Research Working Paper*, (3382). World Bank, Washington, DC.

Docquier, F. & Marfouk, A. (2006). "International migration by educational attainment, 1990-2000" *in*: Ozden, C. et Schiff, M. (Eds). *International Migration, Remittances and Development*, McMillan et Palgrave: N.Y.

Docquier, F. & Rapoport, H. (2005). "The Economics of Migrants' Remittances". *In* Kolm, S.C. et Mercier Ythier, J. (Eds). *Handbook on the Economics of Giving, Reciprocity and Altruism, Vol. 2*, North Holland Editions, Chapter 17, 1135-1198.

Docquier, F., H. Rapoport, & S. Salomone. (2012). "Remittances, Migrants' Education and Immigration Policy: Theory and Evidence from Bilateral Data." *Regional Science and Urban Economics* 42 (5), 817–828.

Dollar, D., & Levin, V. (2006). The increasing selectivity of foreign aid, 1984–2003. *World development*, *34*(12), 2034-2046.

Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy* 84, 1161-1176.

Doucouliagos, H., & Paldam, M. (2010). Conditional aid effectiveness: A meta-study. *Journal of International Development: The Journal of the Development Studies*

Association, *22*(4), 391-410.

Drabo, A., & Ebeke, C. (2010). "Remittances, Public Health Spending and Foreign Aid in the Access to Health Care Services in Developing Countries." Document de travail E 2010.04, Centre d'Études et de Recherche sur le Développement International (CERDI), Clermont-Ferrand, France.

Drapier, C., Jayet, H. & Rapoport, H. (1997). "Les motifs des migrations et des transferts associés. Une revue de littérature sur les conséquences attendues pour les pays en développement". *Région et Développement*, (6): 41-66.

Dreher, A. & Langlotz, S. (2017). Aid and growth. New evidence using an excludable instrument. *Discussion Paper Series*, No. 65, June. Heidelberg University.

Dreher, A., & Langlotz, S. (2020). Aid and growth: New evidence using an excludable instrument. *Canadian Journal of Economics/Revue canadienne d'économique*, *53*(3), 1162-1198.

Drinkwater, S., Levine, P. & Lotti, E. (2009). "The Labour Market and Investment Effects of Remittances". *In* Ghatak S., & Levine P., (Eds). *Development Macroeconomics*, Routledge, London.

Driscoll, J. C., & Kraay, A. C. (1998). "Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data." *Review of Economics and Statistics* 80 (4): 549–560.

Dumitrescu, E-I. & Hurlin, C. (2011). *"Testing for Granger Non-Causality in Heterogeneous Panels," Working Paper, halshs-00224434, Hal.*

Durdu, C. B., & Sayan, S. (2010). "Emerging Market Business Cycles with Remittance Fluctuations." *IMF Staff Papers* 57 (2): 303–325.

Duval, M. R. A., Cheng, M. K. C., Oh, K. H., Saraf, R., & Seneviratne, M. D. (2014). *Trade integration and business cycle synchronization: a reappraisal with focus on asia* (No 14-52). *Washington, DC: International Monetary Fund.*

Duval, R., Li, N., Saraf, R., & Seneviratne, D. (2016). Value-added trade and business cycle synchronization. *Journal of International Economics*, *99*, 251-262.

Dziuba, P., Pryiatelchuk, O., & Rusak, D. (2021). EQUITY MARKETS RISKS AND RETURNS: IMPLICATIONS FOR GLOBAL PORTFOLIO CAPITAL FLOWS DURING PANDEMIC AND CRISIS PERIODS. *Baltic Journal of Economic Studies*, *7*(3), 97-108.

Easterly, W. (1997). *The ghost of financing gap: how the Harrod-Domar growth model still haunts development economics* (No. 1807). World Bank Publications.

Eichengreen, B. (1992). “Should the Maastricht Treaty Be Saved?” *Princeton Studies in International Finance* 74. Princeton University.

Eisensee, T., & Stromberg, D. (2007). “News Droughts, News Floods, and U.S. Disaster Relief”, *Quarterly Journal of Economics*, 122(2), 693-728.

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

El Qorchi, M. (2002). “Hawala. How Does this informal Transfer System Work, and Should It Be Regulated?”. *Finance & Development*, 39 (4): 31-33.

Elbadawi, I. & Rocha, R. R. (1992). “Determinants of Expatriate Workers' Remittances in North Africa and Europe”. *World Bank Working Paper*, (1038).

Elhorst, J. P. (2014). “Spatial Panel Data Models.” In *Spatial Econometrics*, edited by J. P. Elhorst, 37–93. Berlin: Springer.

El-Sakka, M. I. T., & McNabb, R. (1999). “The Macroeconomic Determinants of Emigrant Remittances.” *World Development* 27 (8): 1493–1502.

Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.

Erbaykal, E., & Okuyan, H. A. (2008). “Does Inflation Depress Economic Growth? Evidence from Turkey.” *International Research Journal of Finance and Economics* 17(5):1450–2887.

Eregha, P. B., & Oziegbe, T. R. (2016). Official development assistance, volatility and per capita real gdp growth in sub-Saharan African countries: a comparative regional analysis. *The Journal of Developing Areas*, *50*(4), 363-382.

Erquizio, A. (2008). Ciclos económicos del Estado de México en el contexto regional: 1980-2005. *P. Mejía, LE Del Moral and OM Rodríguez (coords.), Actividad económica en el Estado de México: Desempeño productivo y sector externo, Gobierno del Estado de México, Biblioteca del Bicentenario, Toluca*, 25-56.

Faini, R. (1994). “Workers Remittances and the Real Exchange Rate: A Quantitative Framework.” *Journal of Population Economics* 7 (2), 235–245.

Faini, R. (2006). Migration and Remittances: The Impact on the Countries of Origin. *University of Rome*.

Faini, R. (2007). “Remittances and the Brain Drain: Do more Skilled Migrants Remit More?” *World Bank Economic Review* 21 (2), 177–191.

Fasanya, I. O., & Onakoya, A. B. (2012). Does foreign aid accelerate economic growth? An

empirical analysis for Nigeria. *International journal of economics and financial issues*, *2*(4), 423-431.

Fashina, O. A., Asaleye, A. J., Ogunjobi, J. O. & Lawal, A. I. (2018). "Foreign Aid, Human Capital and Economic Growth Nexus: Evidence from Nigeria." *Journal of International Studies* 11(2):104–117.

Fayissa, B. & Nsiah, C. (2010).*"The Impact of Remittances on Economic Growth and Development in Africa". The American Economist, Vol. 55, N°2, (Fall 2010), 92-103.*

FIDA. (2007). Les transferts d'argent : Travailleurs migrants et envois de fonds, Rome, FIDA, décembre 2007, http://www.ifad.org/even, 26 août 2013.

FIDA. (2009). Les transferts d'argent : Travailleurs migrants et envois de fonds, Rome, FIDA, décembre 2007, http://www.ifad.org/even, 26 août 2013.

Fidrmuc, J. (2004). The endogeneity of optimum currency area criteria, intra-industry trade and EMU enlargement. *Contemporary Economic Policy*, *22*(1), 1–12.

Fidrmuc, J., Ikeda, T., & Iwatsubo, K. (2012). International transmission of business cycles: Evidence from dynamic correlations. *Economics Letters*, *114*(3), 252-255.

Fielding, D. (2006). *A wider approach to aid effectiveness: Correlated impacts on health, wealth, fertility and education.* The World Institute for Development Economics Research (WIDER) established by the United Nations University (UNU).

Fiess, N. (2007). « Business Cycle Synchronization and Regional Integration: A Case Study for Central America ». *The World Bank Economic Review* 21, n° 1, 49‑72.

Filmer, D., & Pritchett, L. (2001). "Estimating Wealth Effects without Expenditure Data—or Tears: An Application to Educational Enrollments in States of India." *Demography* 38 (1): 115–132.

Fink, G., & Redaelli, S. (2011). "Determinants of International Emergency - Aid Humanitarian Need Only?", *World Development*, 39(5), 741-757.

Fleming, J. M. (1962). Domestic financial policies under fixed and under floating exchange rates. *International Monetary Fund Staff Papers* 9, 369-379.

Fleurbaey, M. (1996). *Théories économiques de la justice*, Edition Economica, Paris.

FMI. (2009). *Balance of Payments and International Investment Position Manual* (Sixth Edition). *International Monetary Fund*, Washington D.C.

FMI. (2010). "Staff Guidance Note on the Application of the Joint Bank-Fund Debt Sustainability Framework for Low-Income Countries." Préparé par le personnel du FMI et de la Banque Mondiale, 22 janvier.

Forbes, K. J., & F. E. Warnock (2012). Capital flow waves: Surges, stops, flight, and retrenchment. *Journal of International Economics 88* (2), 235-251.

Forbes, K. J., & Warnock, F. E. (2020). Capital flow waves—or ripples? Extreme capital flow movements since the crisis. *NBER Working Paper* No. 26851. National Bureau of Economic Research, Cambridge, MA.

Frankel, J. (2010). "Are Bilateral Remittances Countercyclical." *Open Economies Review* DINF: 10.1007/s11079-010-9184-y.

Frankel, J. (2011). "Are Bilateral Remittances Countercyclical?" Open Economies Review 22 (1): 1–16.

Frankel, J. A., & Rose, A. K. (1998). "The Endogenity of the Optimum Currency Area Criteria." *The Economic Journal* 108 (449): 1009–1025.

Freund, C. L., & Spatafora, N. (2005). *Remittances: transaction costs, determinants, and informal flows* (Vol. 3704). *World Bank Publications*.

Freund, C. L., & Spatafora, N. (2008). "Remittances: Transaction Costs, Determinants, and Informality". *Journal of Development Economics*, 86 (2): 356-366.

Fries, C., & Kappler, M. (2015). "Does Foreign Direct Investment Synchronise Business Cycles? Results from a Panel Approach." *ZEW-Centre for European Economic Research Discussion Paper* 15–031.

Frot, E. (2009). "The consequences of financial crises on aid," Stockholm Institute of Transition Economics and Stockholm School of Economics, unpublished manuscript (Stockholm: SITE/Stockholm School of Economics).

Fukao, K., Ishido, H., & Ito, K. (2003). Vertical intra-industry trade and foreign direct investment in East Asia. *Journal of Japanese and International Economies, 17*, 468–506.

Funkhouser, E. (1995). "Remittances from International Migration: A Comparison of El Salvador and Nicaragua". *The Review of Economics and Statistics*, 77(1)/ 137-146.

GABAC. (2018). *« Les risques de blanchiment des capitaux et de financement du terrorisme inhérent au changement manuel, et au transferts de fonds en Afrique centrale »*.

Galati, G., & Tsatsaronis, K. (2003). The impact of the euro on Europe's financial markets. *Financial Markets, Institutions & Instruments*, *12*(3), 165-222.

Galiani, S., Knack, S., Xu, L. C., & Zou, B. (2017). The effect of aid on growth: Evidence from a quasi-experiment. *Journal of Economic Growth*, *22*(1), 1-33.

Gammadigbe, V. (2012). « Les cycles économiques des pays de l'UEMOA: synchrones ou

déconnectés ? », *Munich Personal RePEc Archive*, 28.

Gbenou, K. D. A. (2015). Impacts macroéconomiques des transferts de fonds des migrants dans les pays de l'UEMOA. *Journal of Development Studies, 48*(8), 1009-1025.

Ghazi, B. (2007). Mobilité des capitaux en Afrique du Nord. *African Development Review*. 43.

Ghirmay, T. (2004). "Financial Development and Economic Growth in Sub-Saharan African Countries: Evidence from Time Series Analysis." *African Development Review* 16 (3): 415–432.

Gillander, R. (2016). The effects of foreign aid in Sub Saharan Africa. *The Economic and Social Review*, 17 (7), pp. 339-360.

Giuliano, P., & Ruiz-Arranz, M. (2009). "Remittances, Financial Development, and Growth." *Journal of Development Economics* 90 (1): 144–152.

Glytsos, N.P. (1988). "Remittances in Temporary Migration: A Theoretical Model and Its Testing with the Greek-German Experience", *Weltwirtschaftliches Anrhiv*, 124(3): 524-549.

Glytsos, N.P. (1997). "Remitting Behaviour of 'Temporary' and 'Permanent' Migrants: The Case of Greeks in Germany and Australia". *LABOUR*, 11(3): 409-435.

Granger, C.W.J. & Newbold, P. (1974) Spurious regression in econometrics, *Journal of Econometrics*, **2**, 111–120.

Grenville, S. (2021). *The International Monetary Fund and capital flows* (No. 2021-16).

Griffin, K. B., & Enos, J. L. (1970). Foreign assistance: objectives and consequences. *Economic development and cultural change*, *18*(3), 313-327.

Grilli, R., Tedeschi, G., & Gallegati, M. (2015). Markets connectivity and financial contagion. *Journal of Economic Interaction and Coordination*, 10(2), 287–304.

Grossman, G. M., & Helpman, E. (1991). Innovation and growth in the global economy. *MIT press*.

Gunning, J. W. (2004). "Shocks, Risk and African Growth", paper for the AERC project "Explaining African Economic Growth".

Gupta, P. (2005). "Macroeconomic Determinants of Remittances: Evidence from India". *IMF Working Paper*, (05/224), International Monetary Fund.

Gupta, S., Pattillo, C. A., & Wagh, S. (2009). "Impact of Remittances on Poverty and Financial Development in Sub-Saharan Africa." *World Development* 37 (1): 104–115.

Gyimah-Brempong, K., & Racine, J. S. (2014). Aid and economic growth: A robust approach. *Journal of African Development*, *16*(1), 1-35.

Hamilton, J. D. (1989). "A New Approach to the Economic Analysis of Nonstationary Time Series and the Business Cycle," *Econometrica* 57:357–384.

Harms, P., & Méon, P. G. (2011). *An FDI is an FDI is an FDI? The growth effects of greenfield investment and mergers and acquisitions in developing countries* (No. 11.10). Working paper.

Harris, R. G. (1995). Trade and communication costs. *Canadian Journal of Economics*, S46-S75.

Haskel, J. E., Pereira, S. C., & Slaughter, M. J. (2007). Does inward foreign direct investment boost the productivity of domestic firms? *The review of economics and statistics*, 89(3).

Heathcote, J., & Perri, F. (2003). Why has the U.S. economy become less correlated with the rest of the world? *American Economic Review*, *93*, 63–69.

Herrero, A., & Ruiz, J. M. (2008). Do Trade and financial linkages foster business cycle synchronization in a small economy? *Money y Credito*, *226*, 187–226.

Hoddinott, J. (1994). "A Model of Migration and Remittances Applied to Western Kenya." *Oxford Economic Papers* 46, 459–476.

Hodrick, R. J., & Prescott, E. C. (1997). "Postwar US business cycles: an empirical investigation." *Journal of Money, credit, and Banking*, 1-16.

Hoechle, D. (2007). "Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence." *The Stata Journal* 7 (3): 281–312.

Hossain, M. I. (2022). Impacts of social remittances on economic activities: labour migration from a village of Bangladesh to Malaysia. *Migration and Development*, *11*(3), 273-290.

Houndonougbo, A. N. (2017). Aid volatility and real business cycles in a developing open economy. *Southern Economic Journal*, *83*(3), 756-773.

Huang, P. & Vargas-Silva, C. (2005). "Macroeconomic Determinants of Workers' Remittances: Host *vs.* Home Country's Economic Conditions". *International Finance*, (0507007), EconWPA.

Hudson, J., & Mosley, P. (2008). Aid volatility, policy and development. *World Development*, *36*(10), 2082-2102.

Hugon, P. (2007). « Rentabilité du secteur bancaire et défaillances du financement du développement : le cas de la CEMAC ». *Revue Tiers Monde* n° 192 (4): 771.

Hühne, P., Meyer, B., & Nunnenkamp, P. (2014). Who benefits from aid for trade? Comparing the effects on recipient versus donor exports. *The Journal of Development Studies*, *50*(9), 1275-1288.

Hurlin, C., & Mignon, V. (2005). "An Overview of Panel Unit-Root Tests." *Economie Prevision*, no. 3: 253–294.

Im, K. S., Pesaran, M. H. & Shin, Y. (2003). "Testing for Unit Roots in Heterogeneous Panels", *Journal of Econometrics*, 115, 1, 53-74.

Imbs, J. (2004). Trade, finance, specialization, and synchronization. *Review of economics and statistics*, *86*(3), 723-734.

Imbs, J. (2006). "The Real Effects of Financial Integration." *Journal of International Economics* 68 (2): 296–324.

Imbs, J. (2010). The first global recession in decades. *IMF economic review*, *58*(2), 327-354.

Inklaar, R., Jong-A-Pin, R., & De Haan, J. (2008). "Trade and Business Cycle Synchronization in OECD Countries – a Re-Examination." *European Economic Review* 52 (4): 646–666.

Inklaar, R., Jong-A-Pin, R., & Jakob de Haan. (2005). « Trade and Business Cycle Synchronization in OECD Countries—A Re-Examination ». *European Economic Review* 52, n° 4, 646‑66.

Jackman, M., Craigwell, R., & Moore, W. (2009). Economic volatility and remittances : Evidence from SIDS. *Journal of Economic Studies*, *36*(2), 135‑146.

Jansen, W. J., & Stokman, A. C. (2011). International business cycle comovement: Trade and foreign direct investment.

Jansen, W. J., & Stokman, A. C. J. (2014). International business cycle co-movement: The role of FDI. *Applied Economics*, 46(4), 383–393.

Jena, N. R., & Sethi, N. (2021). Foreign capital and growth nexus revisited: empirical evidence from South Asian countries. *Transnational Corporations Review*, *13*(3), 269-292.

Jepma Catrinus J. (1991). *"The Tying of Aid"*. Paris: OECD.

Jimenez-Martin, S., Jorgensen, N. & Labeaga, J. (2007). *The Volume and Geography of Remittances from the EU*. Tech. Rep., Report to the European Commission.

Johansen, S. (1988). "Statistical Analysis of Cointegration Vectors", *Journal of Economic Dynamics and Control*, 12, 231-254.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with appucations to the demand for money. *Oxford Bulletin of Economics and statistics*, *52*(2), 169-210.

Jones, Y. M. (2013). Testing the foreign aid-led growth hypothesis in West Africa. *Birkbeck Working Papers in Management*, BWPMA 1303, London.

Juselius, K., Moller, N. F. & Tarp, F. (2013). The long run impacts of foreign aid in 36 African

countries: insights from multivariate time series analysis. *Oxford Bulletin of Economics and Statistics*, 76 (2).

Kalemli-Ozcan, S., Papaioannou, E., & Peydró, J.-L. (2013). "Financial Regulation, Financial Globalization, and the Synchronization of Economic Activity: Financial Integration and Synchronization", *Journal of Finance*, 68(3), 1179–1228.

Kalemli-Ozcan, S., Sørensen, B. E., & Yosha, O. (2001). Economic integration, industrial specialization, and the asymmetry of macroeconomic fluctuations. *Journal of International Economics*, *55*, 107–137.

Kalemli-Ozcan, S., Sørensen, B. E., & Yosha, O. (2003). Risk sharing and industrial specialization: Regional and international evidence. *American Economic Review*, *93*(3), 903-918.

Kaminsky, G. L., Reinhart, C. M., & Végh, C. A. (2004). When it rains, it pours: procyclical capital flows and macroeconomic policies. *NBER macroeconomics annual*, 19, 11–53.

Kannan, K. P., & Hari, K. S. (2002). Kerala's gulf connection: emigration, remittances and their macroeconomic impact, 1972-2000.

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of econometrics*, *90*(1), 1-44.

Karpowicz, I. (2006). "Determinants of Emigrant Deposits in Cape Verde". *IMF Working Paper (06/132), International Monetary Fund.*

Kaya, A. İ. (2021). Capital Flow Surges and Volatility.

Kaya, A. I., & de Haan, J. (2022). Capital flows, EU integration and the global financial crisis: an empirical analysis. *Journal of Applied Economics*, *25*(1), 1025-1049.

Keho, Y. (2008). Dépenses publiques et croissance économique en côte d'ivoire : une approche en termes de causalité, *Bulletin de Politique économique*, BUPED N° 138, CAPEC.

Kehoe, P. J., Backus, D. K., & Kydland, F. E. (1995). International Business Cycles: Theory vs. Evidence. In *Frontiers of Business Cycle Research*. Princeton University Press.

Kenen, P. (1969). "The theory of optimum currency areas: An eclectic view", *Monetary problems in the international economy* (pp. 41–60). Chicago and London: University of Chicago Press, 41-60.

Knack, S. (2009). Sovereign rents and quality of tax policy and administration. *Journal of Comparative Economics*, *37*(3), 359-371.

Kollmann, R. (2019). Explaining international business cycle synchronization: recursive preferences and the terms of trade channel. *Open Economies Review*, *30*(1), 65-85.

Köse, H., & Akın, H. L. (2007). "The Reverse Monte Carlo Localization Algorithm". Robotics and Autonomous Systems 55 (6): 480‑489.

Kose, M. A., & K. M. Yi (2001). "International trade and business cycles: is vertical specialization the missing link?", *American Economic Review*, Vol. 91, n°2, 371-375.

Kose, M. A., & Prasad, E. (2010). Resilience of emerging market economies to economic and financial developments in advanced economies. *Economic papers* (411), 1–202.

Kose, M. A., Otrok, C., & Prasad, E. S. (2012). *Global business cycles: convergence or decoupling?* (No. w14292). National Bureau of Economic Research.

Kose, M. A., Otrok, C., & Whiteman, C. H. (2008). Understanding the evolution of world business cycles. *Journal of international Economics*, *75*(1), 110-130.

Kose, M. A., Prasad, E. S., & Terrones, M. E. (2003). "How Does Globalization Affect the Synchronization of Business Cycles?" *American Economic Review* 93 (2): 57–62.

Kouparitsas, M. (2001). « Is There a World Business Cycle? », 4.

Krugman, P. (2008). » The International Finance Multiplier «, web.

Krugman, P. R. (1993). What do undergrads need to know about trade? The *American Economic Review*, 83(2), 23–26.

Krugman, P. R. (1993). What do undergrads need to know about trade? The *American Economic Review*, 83(2), 23–26.

Kydland, F. E., & Prescott, E. C. (1982). Time to build and aggregate fluctuations. *Econometrica: Journal of the Econometric Society*, 1345-1370.

Kydland, F. E., & Prescott, E. C. (1990). Business cycles: Real facts and a monetary myth. *Federal Reserve Bank of Minneapolis Quarterly Review*, *14*(2), 3-18.

Lacroix, J., Méon, P.-G., & Sekkat, K. (2021). Democratic transitions can attract foreign direct investment: Effect, trajectories, and the role of political risk. *Journal of Comparative Economics* 49(2): 340–357.

Lampa, R. (2021). Capital flows to Latin America (2003–17): a critical survey from Prebisch's business cycle theory. *Review of Political Economy*, *33*(1), 103-125.

Lane, P. R., & Benetrix, A. (2010). *International differences in fiscal policy during the global crisis*. Centre for Economic Policy Research.

Lee, D. W., Shin, H. H., & Stulz, R. M. (2021). Why Does Equity Capital Flow out of High Tobin's Industries?. *The Review of Financial Studies*, *34*(4), 1867-1906.

Lee, H. H., Park, C. Y., & Pyun, J. H. (2022). International Business Cycle Synchronization: A Synthetic Assessment. *Asian Development Bank Economics Working Paper Series*,

(668).

Lee, J. (2010). Globalization and business cycle synchronization: Evidence from the United States. *Journal of International and Global Economic Studies*, 3(1), 41–59.

Leon-Ledesma, M. & Piracha, M. (2004). "International Migration and the Role of Remittances in Eastern Europe". *International Migration*, 42 (4): 65-83.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002), "Unit Root Test in Panel Data : Asymptotic and Finite Sample Properties", *Journal of Econometrics*, 108, 1-24.

Levine, R. (1997). Financial development and economic growth: views and agenda. The *World Bank.*

Levitt, P. (1998). "Social Remittances: Migration Driven Local-Level Forms of Cultural Diffusion", *International Migration Review*, Vol. 32(4): 926-948.

Lewis, W. A. (1954). "Economics Development With Unlmimited Supplies Of Labor", *Manchester School of Economic and Social Studies*, (22): 139-191.

Li, X., & Liu, X. (2005). Foreign direct investment and economic growth: an increasingly endogenous relationship. *World development*, *33*(3), 393-407.

Lof, M., Mekasha, T. J., & Tarp, F. (2015). Aid and income: Another time-series perspective. *World Development*, *69*, 19-30.

Long. J., & Plosser. C. (1983). "Real Business Cycle", *Journal of Political Economy*, vol. 91(1), 39-69.

Lopez, A., De Lucas, S., & Delgado, M. J. (2021). Economic convergence in a globalized world: The role of business cycle synchronization. *PloS one*, *16*(10), e0256182.

Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behavior : Evidence from panel VAR. *The Quarterly Review of Economics and Finance*, *46*(2), 190‑210.

Lowell, B. L., & De La Garza, R. O. (2000). The Developmental Role of Remittances in U.S. Latino Communities and In Latin American Countries. *Report of the Tomás Rivera Policy Institute and the Inter-American Dialogue, Georgetown University, Washington.*

Loxley, J. & Sackey, H. A. (2008). Aid Effectiveness in Africa. *African Development Review*, 20**,** 163-199.

Lozej, M. (2019). Economic migration and business cycles in a small open economy with matching frictions. *Economic Modelling*, *81*, 604‑620.

Lucas, R. E. (1977). Understanding business cycles. In *Carnegie-Rochester conference series on public policy* (Vol. 5, 7-29). North-Holland.

Lucas, R. E. B. & Stark, O. (1985). "Motivations to Remit: Evidence from Botswana." *Journal of Political Economy* 93 (5): 901–18.

Lucas, R. E. B. (1987). "Emigration to South Africa's Mines." *American Economic Review* 77 (3): 313–30.

Lueth, E., & M. Ruiz-Arranz. (2008). "Determinants of Bilateral Remittance Flows." *The B.E. Journal of Macroeconomics* 8 (1 (Topics)), Article 26.

Lumsdaine, R. L., & Prasad, E. S. (2003). Identifying the common component of international economic fluctuations: a new approach. *The Economic Journal*, *113*(484), 101-127.

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and statistics*, *61*(S1), 631-652.

Magesan, A. (2016). Foreign aid and economic growth in developing countries: an instrumental variables approach. *Available at SSRN 2584235*.

Maimbo, S. M. & Ratha, D. (2005). *Transferts de fonds : impact sur le développement et perspectives d'avenir*. Publications de la Banque Mondiale.

Makhlouf, F., & Mughal, M. (2013). Remittances, Dutch disease, and competitiveness: a Bayesian analysis. *Journal of Economic Development*, *38*(2), 67.

Makina, D., & Masenge, A. (2015). "The Time Pattern of Remittances and the Decay Hypothesis: Evidence from Migrants in South Africa." *Migration Letters* 12 (1).

Mandelman, F. S., & Zlate, A. (2012). Immigration, remittances and business cycles. *Journal of Monetary Economics*, *59*(2), 196‑213.

Mangalu, J. A. (2011). Migrations internationales, transfert des migrants et conditions de vie des ménages d'origine. *Cas de la ville de Kinshasa, Louvain-la-Neuve, Presses universitaires de Louvain*.

Maqsood, F., & Ullah, S. (2014). *Foreign Aid Volatility and Socio-Economic Dimensions of Human Development Index : A Case Study of Pakistan*. 9.

Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor J. E. (1993). "Theories of International Migration: a Review and Appraisal". *Population and Development Review*, 19 (3), 431-466.

Masson, P. R., & Taylor, M. P. (1994). Optimal currency areas: a fresh look at the traditional criteria. *In Varieties of monetary reforms*, 23–43.

Masson, P. R., & Taylor. P. (1992). « OPTIMAL CURRENCY AREAS: A FRESH LOOK AT THE TRADITIONAL », 2.

Mbou Likibi, G. S. (2015). « Cycles Economiques Dans La Zone Cemac », *Working Paper*

n°478, *Inter-American Development Bank*, 3, nº 3, 169‑84.

McKenzie, D., & Sasin, M. J. (2007). « Migration, Remittances, Poverty et Human Capital: Conceptual and Empirical Findings.” Document de travail pour la recherche sur les politiques 4272, *Banque Mondiale*, Washington.

McKinnon R. I. (1991). “The Order of Economic Liberalization: Financial Control in the Transition to a Market Economy”, 2éme edition, *The Johns Hopkins University Press*, 200.

McKinnon, R. (1963). Optimum currency areas. *American Economic Review*, 53(4), 717–725.

McKinnon, R. (1973). Money and capital in economic development (Brookings, Washington, DC). *Obstfeld, M., JC Shambaugh and AM Taylor (2008) Financial Stability, The Trilemma, and International Reserves NBER working paper (14217)*.

Melde, S. & J. Schicklinski. (2011). “Remittances in the African, Caribbean and Pacific countries”, Background note ACPOBS/2011/BN02.

Mendoza, E. (1997). “Terms of Trade Uncertainty and Economic Growth,” *Journal of Development Economics* 54: 323–356.

Mendoza, R. U., Jones, R., & Vergara, G. (2009). “Will the global financial crisis lead to lower foreign aid? A first look at United States ODA,” Fordham University Department of Economics Discussion Paper No. 1 (New York, NY: Fordham University).

Michael, A. A., Mukaila, A. I., Gafar, T. I., Raji, A. B., Mufthau, A. I., & Sidikat, L. A. (2009). International remittances and well-being in sub-Saharan Africa. *Journal of Economics and International Finance*, *1*(3), 078-084.

Miyamoto, W., & Nguyen, T. L. (2019). *International linkages and the changing nature of international business cycles*. Institute of Economic Research, Hitotsubashi University.

Mohapatra, S. & Ratha, D. (2010). “Forecasting migrant remittances during the global financial crisis”. *Migration Letters*, 7(2): 203-213.

Mohapatra, S. & Ratha, D. (2011). “Migrant remittances in Africa: an overview”, in (S. Mohapatra and D. Ratha, eds.), *Remittance Markets in Africa*, 3–70, World Bank, Washington, DC.

Mohapatra, S., George, J., & Ratha, D. (2009). “Remittances and Natural Disasters: Ex-Post Response and Contribution to Ex-Ante Preparedness.” Document de travail pour la recherche sur les politiques 4972, Banque Mondiale, Washington.

Mohapatra, S., Joseph, G. & Ratha, D. (2012). “Remittances and Natural Disasters: Ex-post Response and Contribution to Ex-ante Preparedness.” Environment, *Development and*

Sustainability 14 (3): 365–387.

Mold, A., Olcer, D., & Prizzon, A. (2008). "The fallout from the financial crisis: Will aid budget fall victim to the credit crisis?" OECD Development Center Policy Insights No. 85 (Paris: Organization for Economic Co-operation and Development).

Monnet, E., & Puy, D. (2016). Has globalization really increased business cycle synchronization? *IMF Working Paper*, 54.

Morgan, D. P., Rime, B., & Strahan, P. (2004). Bank integration and state business cycles. *Quarterly Journal of Economics*, *119*, 1555–1584.

Morrison, K. (2012). The world Bank, Japan, and aid effectiveness. In *Japan's Foreign Aid* (37-54). Routledge.

Morrissey, O. (2001). "Does aid increase growth?," *Progress in Development Studies*, vol.1, no.1, 37-50.

Mouhoud, E.M., Oudinet, J. & Unan, E. (2008). "Macroeconomic Determinants of Remittances in the Southern and Eastern Mediterranean Countries". *6th International Conference of the MEEA* (Middle East Economic Association), Dubaï 14-16 March.

Moumouni, C., & Nkoa, C. (2005). Le double langage du NEPAD Des flux de capitaux étrangers pour un développement endogène. *Perspective Afrique*, *1*(2), 171-186.

Moundigbaye, M., Messemer, C., Parks, R. W., & Reed, W. R. (2020). "Bootstrap Methods for Inference in the Parks Model." *Economics* 14 (1): 1–18.

Moundigbaye, M., Rea, W. S., & Reed, W. R. (2018). "Which Panel Data Estimator Should I Use?: A Corrigendum and Extension." *Economics* 12 (1): 1–31.

Mughal, M. Y., & Ahmed, J. (2014). Remittances and Business Cycles : Comparison of South Asian Countries. *International Economic Journal*, *28*(4), 513‑541.

Mundell, R. (1961). A theory of optimum currency areas. *American Economic Review*, 51(4), 657–665.

Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science* 29, 475-485.

Muteta, N. (2005). Transferts Financiers des Migrants Congolais de la Belgique vers la République Démocratique du Congo. *Etude menée dans le cadre du programme VALEPRO d'OCIV/Migration et Développement. Avec le soutien de la Commission Européenne et la Direction Générale de la Coopération au Développement Belge*.

N'Guessan, B. (2010). « ANALYSE COMPAREE DES EVOLUTIONS DU CREDIT ET DE L'ACTIVITE ECONOMIQUE DANS L'UEMOA », *DEPARTEMENT DES ETUDES*

ECONOMIQUES ET DE LA MONNAIE, Direction de la Recherche et de la Statistique, 30.

Nagarajan, S. (2009). "Migration, Remittances and Household Health: Evidence from South Africa." Thèse de doctorat, Département d'économie, George Washington University, Washington.

Narayan, P. K., & Narayan, S. (2005). Estimating income and price elasticities of imports for Fiji in a cointegration framework. *Economic Modelling*, *22*(3), 423-438.

Narayan, P. K., & Smyth, R. (2004). Crime rates, male youth unemployment and real income in Australia: evidence from Granger causality tests. *Applied Economics*, *36*(18), 2079-2095.

Naudé, W., & Bezuidenhout, H. (2012). "Remittances Provide Resilience against Disasters in Africa." *UNU-MERIT Working Paper Series 026, United Nations University, Maastricht Economic and social Research and training centre on Innovation and Technology*.

Ndikumana, L. (2005). « Financial development, financial structure, and domestic investment: International evidence ». *Journal of International Money and Finance*, 2005.

Ndikumana, L., & Boyce, J. (2002). Public Debts and Private Assets: Explaining Capital Flight from Sub-N. Hermes Saharan African Countries. *PERI Working Paper* 32.

Ndikumana, L., & Boyce, J. (2003). Public Debts and Private Assets: Explaining Capital Flight from Sub-Saharan African Countries. *World Development*, 31, 107-130.

Ndione, B. (2014). L'Afrique centrale face aux défis migratoires. Migration ACP.

Niimi, Y., Caglar, O., & Schiff, M. (2010). "Remittances and the Brain Drain: Skilled Migrants do Remit Less." *Annales d'Economie et de Statistique* (97–98), 123–41.

Nisar, A. & Tufail, S. (2013). *" An Analysis of Relationship between Remittances and Inflation in Pakistan", Zagreb Intemational Review of Economics & Business. Vol. 16. n°. 2*, 19-38.

Noah, B. M., & Fambon, S. (2019). Interactions fiscales stratégiques entre pays de la CEMAC et flux entrants d'investissements directs étrangers. *Region et Developpement*, *49*, 127-150.

Obstfeld, M., & Rogoff, K. (1995). Exchange rate dynamics redux. *Journal of Political Economy* 103, 624-660.

OCDE. (2006a). "Development Aid at a Glance", *Statistics by region*.

OCDE. (2012). Development: Aid to developing countries falls because of global recession.

Available: http://www.oecd.org/newsroom/developmentaidtodevelopingcountriesfallsbecauseofglobalrecession.htm

OCDE. (2014). Official Development Assistance (ODA) Available: https://data.oecd.org/oda/net-oda.htm

OCDE. (2018), "OECD policy brief", SecretaryGeneral of the OECD, Paris.

OECD. (2006b). *"Development Co-operation Report"*. Volume 7, No. 1. Paris: OECD. ISBN 92-64-03651-2.

Osili, U. O. (2007). "Remittances and Savings from International Migration: Theory and Evidence Using a Matched Sample." *Journal of Development Economics* 83 (2), 446–465.

Otto, G., Voss, G., & Willard, L. (2001). "Understanding OECD output correlations", *RBA Research Discussion Papers*. Sydney: Economic Research Department, Reserve Bank of Australia, (2001–05), 2001–2005.

Pallage, S., & Robe, M. A. (2001). Foreign aid and the business cycle. *Review of International Economics*.

Pallage, S., Robe, M. A., & Beroube, C. (2006). "The potential of foreign aid as insurance," *IMF Staff papers*, Vol. 53, Issue 3, 453–475.

Parks, R. W. (1967). "Efficient Estimation of a System of Regression Equations When Disturbances Are Both Serially and Contemporaneously Correlated." *Journal of the American Statistical Association* 62 (318): 500–509.

Paulin, D. D. G., Albert, V., & Louise, B. A. (2018). Analyse Des Fondements Théoriques De L'aide Publique au Développement. *Global Journal of HUMAN-SOCIAL SCIENCE: E Economics*. 11.

Pentecôte, J.-S., Poutineau, J.-C., & Rondeau, F. (2013). *Trade Integration and Business Cycle Synchronization in the EMU: the Negative Effect of New Trade Flows*. Center for Research in Economics and Management (CREM), University of Rennes 1, University of Caen and CNRS.

Perez-Saiz, H., Dridi, M. J., Gursoy, T., & Bari, M. (2019). *The impact of remittances on economic activity: the importance of sectoral linkages*. International Monetary Fund.

Perspectives Economiques de l'OCDE. (2002). « Les changements en cours du cycle économique », 18 pages.

Pesaran, M. H. (2006). "Estimation and Inference in Large Heterogeneous Panels with a

Multifactor Error Structure." *Econometrica* 74 (4): 967–1012.

Pesaran, M. H. (2007). "A Simple Panel Unit Root Test in the Presence of Cross-Section Dependence." *Journal of Applied Econometrics* 22 (2): 265–312.

Pesaran, M. H. (2021). "General Diagnostic Tests for Cross-Sectional Dependence in Panels." *Empirical Economics* 60: 13–50.

Pesaran, M. H., & Timmermann, A. (2005). Small sample properties of forecasts from autoregressive models under structural breaks. *Journal of Econometrics*, *129*(1-2), 183-217.

Pesaran, M. H., Schuermann, T., & Weiner, S. M. (2004). "Modeling Regional Interdependencies Using a Global Error-Correcting Macroeconometric Model." *Journal of Business & Economic Statistics* 22 (2): 129–162.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326.

Phillips, P. C. B. & Hansen B. E. (1990). Statistical inference in instrumental variables regression with I(1) processes. *Review of Economic Studies*, 57, 99–125.

Phillips, P. C. B. & Perron, P. (1988). "Testing for a Unit Root in Time Series Regression", *Biometrika*, 75, 335-346.

Phiri, M. W. (2017). The impact of aid on the economic growth of developing countries (LDCs) in Sub-Saharan Africa. *Gettysburg Economic Review*, *10*(1), 4.

Plaza, S., Navarrete, M., & Ratha, D. (2011). "Migration and Remittances Household Surveys in Africa: Methodological Aspects and Main Findings." Banque Mondiale, Washington.

PMC. (2010). Les transferts d'argent en Afrique : problématiques, enjeux, défis et perspectives, PMC, juin 2010, www.performancesconsulting.com, 7 novembre 2013.

Poirine, B. (1997). "A Theory of Remittances as an Implicit Family Loan Arrangement." *World Development* 25 (4), 589–611.

Ponce, A. (2001). Determinantes de los ciclos económicos en México:¿ Choques agregados o desagregados?. *Gaceta de Economía*, *6*(12), 117-155.

Ponce, J., Olivié, I. & Onofa, M. (2008). "Remittances for Development? A Case Study of the Impact of Remittances on Human Development in Ecuador". *Presented at the World Bank ABCDE*, Cape Town.

Portes, A. & Böröcz, J. (1989). "Contemporary Immigration: Theoretical Perspectives on Its Determinants and Modes of Incorporation". *International Migration Review*. 23 (87): 606-630.

Pradhan, G., Upadhyay, M. & Upaddhyay, K. (2008). "Remittances and Economic Growth in Developping Countries". *European Journal of Development Research. Taylor and Francis Journals*, 20 (3): 497-506.

Pyun, J. H., & An, J. (2016). Capital and credit market integration and real economic contagion during the global financial crisis. *Journal of International Money and Finance*, *67*, 172-193.

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

Rajan, R. G. & Subramanian. (2008). Aid and growth: What does cross-country evidence really show? *The Review of Economics and Statistics*, 90(4), November, 643-665.

Rajan, R. G., & Subramanian, A. (2005). "What Undermines Aid's Impact on Growth?" Document de travail du FMI 05/127, *Fonds Monétaire International*, Washington.

Ramey, G., & Ramey, V. A. (1995). "Cross-Country Evidence of the Link Between Volatility and Growth," *American Economic Review* 85:1138–1151.

Rana, P. B. (2007). Trade intensity and business cycle synchronization: the case of east asia (Rapport technique). ADB Working Paper Series on *Regional Economic Integration*.

Rao, B., & Hassan, G. R. (2009). "A Panel Data Analysis of the Growth Effects of Remittances." Document de travail de MPRA 18021, Munich. http://mpra.ub.uni-muenchen.de/18021/1/MPRA_paper_18021.pdf.

Rapoport, H., & Docquier, F. (2006). "The Economics of Migrants' Remittances." In S. Kolm, and J. Mercier Ythier, eds., *Handbook on the Economics of Giving, Altruism and Reciprocity*, vol. 2, Elsevier, 1135–1198.

Raschky, P. A., & Schwindt, M. (2012). "On the channel and type of aid: The case of international disaster assistance", *European Journal of Political Economy*, 28(1), 119-131.

Ratha, D. (2003). "Workers' Remittances: an Important and Stable Source of External Development Finance". *In Global Development Finance*, World Bank.

Ratha, D. (2007). "Leveraging Remittances for Development." Policy Brief, Migration Policy Institute, Washington.

Ratha, D., De, P., & Mohapatra, S. (2011). "Shadow Sovereign Ratings for Unrated Developing Countries." *World Development* 39 (3): 295–307.

Ratha, D., Mohapatra, S., & Plaza, S. (2009). "Beyond Aid: New Sources and Innovative Mechanisms for Financing Development in Sub-Saharan Africa." Dans Innovative

Financing for Development, ed. Suhas Ketkar & Dilip Ratha, 143–83. Washington: Banque Mondiale.

Ravn, M. O., & Uhlig, H. (2002). "On Adjusting the Hodrick-Prescott Filter for the Frequency of Observations." *Review of Economics and Statistics* 84 (2): 371–376.

Rawls J. (1971). *Théorie de la justice*. Le Seuil, Paris.

Reed, W. R., & Webb, R. (2010). "The PCSE Estimator Is Good – Just not as Good as You Think." *Journal of Time Series Econometrics* 2 (1).

Reed, W. R., & Ye, H. (2011). "Which Panel Data Estimator Should I Use?" *Applied Economics* 43 (8): 985–1000.

Refaei, R., & Sameti, M. (2015). Official development assistance and economic growth in Iran. *International Journal of Management, Accounting and Economics, 2*(2), 125-135.

Reidy, P. (2016). Aid and growth revisited: impact of foreign aid and growth in Sub-Saharan Africa. *The Student Economic Review*, 30, pp. 114-128, Dublin 2, Ireland.

Reinhart, C. M., & Reinhart, V. R. (2008). Capital flow bonanzas: An encompassing view of the past and present. *NBER Working Paper* No. 14321. *National Bureau of Economic Research*, Cambridge, MA.

Reinhart, C. M., & Reinhart, V. R. (2009). Capital flow bonanzas: An encompasssing view of the past and present. Ensayos sobre *POLÍTICA ECONÓMICA*, 27(59), 188–250.

Roemer, J. E. (1996). *Theories of Distributive Justice*. Harvard University Press, Cambridge Mass.

Roodman, D. (2009). "A Note on the Theme of too Many Instruments." *Oxford Bulletin of Economics and Statistics* 71 (1), 135–158.

Rose, A. (2011). Understanding business cycle synchronization: Is inflation targeting paving the way to Asian monetary union? In R. J. Barro, & J.-W. Lee (Eds.), *Costs and benefits of economic integration in Asia*, 89–125. Oxford Scholarship Online.

Rothert, J. (2020). "International Business Cycles in Emerging Markets." *International Economic Review* 61(2): 753–781.

Ruiz, I., & Vargas-Silva, C. (2014). Remittances and the Business Cycle : A Reliable Relationship? *Journal of Ethnic and Migration Studies, 40*(3), 456‑474.

Sahoo, K. & Sethi, N. (2017), "Impact of foreign capital on economic development in India: an econometric investigation", Global Business Review, Vol. 18 No. 3, pp. 766-780.

Sarr, F., & Ndiaye, C. (2011). Asymétrie et convergence des politiques et chocs budgétaires en zone uemoa. *Revue Économique et Monétaire* N° 8.

Sayan, S. (2004). “Guest workers’ Remittances and Output Fluctuations in Host and Home Countries: The Case of Remittances from Turkish Workers in Germany.” *Emerging Markets Finance and Trade* 40 (6): 68–81.

Sayan, S. (2006). “Business Cycles and Workers’ Remittances: How Do Migrant Workers Respond to Cyclical Movements of GDP at Home?” Document de travail du FMI 06/52, *Fonds Monétaire International*, Washington.

Sayan, S., & Tekin-Koru, A. (2012). Transferts de fonds, cycles économiques et pauvreté : l’expérience turque récente. *Migrations internationales*, *50*, e151-e176.

Schiavo, S. (2008). “Financial integration, GDP correlation and the endogeneity of optimum currency areas”, *Economica*, 75(297), 168–189.

Schrooten, M. (2006). “Workers’ Remittances to Former Soviet States”. *Discussion Paper Series A*, (476), Institute of Economics Research, Hitotsubashi University.

Sen, A. (1970). Strategies of economic development: feasibility constraints and planning. In *Economic Development in South Asia* (pp. 369-378). Palgrave Macmillan, London.

Sen, K. (1999). What motivates foreign aid: a case study of Australia’s aid to Indonesia. *The Journal of Developing Areas*, *33*(3), 379-394.

Senay, O. (1998). The effects of goods and financial market integration on macroeconomic volatility. *The Manchester School Supplement* 66, 39-61.

Sethi, N. (2014). Foreign Aid vs. Economic Development: Exploring the Empirical Linkage for India, Sri Lanka and Maldives.

Sethi, N., Bhujabal, P., Das, A., & Sucharita, S. (2019). Foreign aid and growth nexus: Empirical evidence from India and Sri Lanka. *Economic Analysis and Policy*, *64*, 1-12.

Severino, J. M., & Ray, O. (2010). Taking the measure of Global Aid. *Current History*, *109*(723), 35.

Severino, J. M., & Ray, O. (2012). La fin de l’aide publique au développement: les enjeux de l’action hypercollective. *Revue d’économie du développement*, *20*(2), 83-142.

Shahbaz, M. & Aamir, I. I. (2009). “Determinants of Workers’ Remittances: Implications for the Poor People of Pakistan”. *European Journal of Scientific Research*, 25(1): 130-144.

Shaw, E. S. (1973). “Financial Deepening in Economic Development”, *Oxford University Press, New-York*, 260.

Sheikh Ahmed, Z. (2014). The effect of foreign aid on economic growth: A cross section study on aid to Sub-Saharan Africa.

Shin, K., & Wang, Y. (2004). “Trade Integration and Business Cycle Co-Movements:

The Case of Korea with Other Asian Countries." *Japan and the World Economy* 16 (2): 213–230.

Singh, R. J., Haacker, M & Lee, K-w. (2009). "Determinants and Macroeconomic Impact of Remittances to Sub-Saharan Africa." Document de travail du FMI 09/216, *Fonds Monétaire International*, Washington.

Singh, R. J., Haacker, M & Lee, K-w. (2009). "Determinants and Macroeconomic Impact of Remittances to Sub-Saharan Africa." Document de travail du FMI 09/216, *Fonds Monétaire International*, Washington.

Singh, R. J., Haacker, M., Lee, K.-W. & Goff, M. L. (2010). *"Determinants and Macroeconomic Impact of Remittances in Sub-Saharan Africa". Journal of African Economies, Vol. 20, number 2, 312–340. 25 October 2010.*

Singh, R. J., Haacker, M., Lee, K.-w., & Le Goff, M. (2011). "Determinants and Macroeconomic Impact of Remittances in Sub-Saharan Africa." *Journal of African Economies* 20 (2): 312–340.

Stark, O. (1991). *The Migration of Labor*. Cambridge, Massachusetts, Blackwell Publishers.

Stark, O. (1995). *Altruism and Beyond*, Oxford and Cambridge: Basil Blackwell.

Stark, O. (2009). "Reasons for Remitting." *World Economics* 10 (3): 147–158.

Stevens, G. V., & Lipsey, R. E. (1992). Interactions between domestic and foreign investment. *Journal of international money and Finance*, *11*(1), 40-62.

Stiblarova, L. (2021). "Business Cycle Synchronization within the Euro Area: Disentangling the Effects of FDI." *Applied Economics Letters*. Routledge.

Stiglitz, J. E. (2008). Government failure vs. market failure: Principles of regulation.

Stock, J. H. & Watson, M. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica*, 61, 783–820.

Stock, J. H., & Watson, M. W. (2002). Has the Business Cycle Changed and Why? *Harvard University and Princeton University. Mimeo*.

Straubhaar, T. (1986). "The Determinants of Workers' Remittances: The Case of Turkey". *Weltwirtschafliches Archiv*, (122): 728-740.

Sutherland, A. (1996). Financial market integration and macroeconomic volatility. *Scandinavian Journal of Economics* 98, 129-539.

Svensson, J. (2000). When is foreign aid policy credible? Aid dependence and conditionality. *Journal of development economics*, *61*(1), 61-84.

Tait, L., Siddique, A. & Chatterjee, I. (2015). Foreign aid and economic growth in Sub-Saharan

Africa. *University Western Australia Working Papers*, No. 1-35, March.

Tang, K. B., & Bundhoo, D. (2017). Foreign aid and economic growth in developing countries: Evidence from Sub-Saharan Africa. *Theoretical Economics Letters*, *7*(05), 1473.

Tefera, M., & Nicholas, O. (2020). On the Link between Foreign Aid and Growth in Developing Countries. *Acta Universitatis Danubius. Œconomica*, *16*(6).

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of econometrics*, *66*(1-2), 225-250.

Todaro, M. P. (1969). "A Model of Labor Migration and Urban Unemployment in Less Developed Countries". *American Economic Review*, 59 (1): 138-148.

Todaro, M. P. (1976). "Internal Migration in Developing Countries: A Review of Theory, Evidence, Methodology and Research Priorities". *International Labour Office, Geneva.*

Todaro, M. T., & Smith, S. C. (2015). *Economic Development*, 12th edition. Pearson.

Touna Mama, E. (2008). L'économie camerounaise, pour un nouveau départ. *Africaine d'Edition*.

Tra, T. (2014). *Foreign Aid and Economic Growth: The Impact of Aid on Determinants of Growth - The Case of Vietnam*. https://aaltodoc.aalto.fi/handle/123456789/15276

Trancoso, T., & GOMES, S. (2020). "The Financial Driver of Business Cycle Synchronization". *IBIMA Business Review*. Vol. 2020 (2020), Article ID 420739, 17 pages, ISSEN: 1947-3788.

Trancoso, T., & GOMES, S. (2020). "The Financial Driver of Business Cycle Synchronization". *IBIMA Business Review*. Vol. 2020 (2020), Article ID 420739, 17 pages, ISSEN: 1947-3788.

UEDA, K. (2003). Banking globalization and international business cycles: Cross-border chained credit contracts and financial accelerators. *Journal of International Economics*, *86*, 1–16.

Vargas-Silva, C. & Huang, P. (2006). "Macroeconomic Determinants of Workers' Remittances: Host versus Home Country's Economic Conditions". *Journal of International Trade & Economic Development*, 15(1): 81-99.

Vargas-Silva, C. (2008). "Are Remittances Manna from Heaven? A Look at the Business Cycle Properties of Remittances." *The North American Journal of Economics and Finance* 19 (3), 290–303.

Wamboye, E. (2012). Quantity or quality? foreign aid implications on economic growth in least developed countries.

Wang, M., & Wong, M. C. S. (2009). What drives economic growth? The case of cross-border M&A and greenfield FDI activities. *Kyklos*, *62*(2), 316-330.

Warsi, A. Z., Mubarik, M. S., & Hussain, J. (2013). *"Effect of Workers' Remittances on Balance of Trade, Inflation and Economic Growth in Pakistan". Pakistan Business Review*.

Weisskoff, T. E. (1972). An econometric test of alternative constraints on economic growth of underdeveloped countries. *Review of Economics and Statistics*, 54, 67–78.

Wouterse, F. (2010). "Remittances, Poverty, Inequality and Welfare: Evidence from the Central Plateau of Burkina Faso" *Journal of Development Studies* 46 (4): 771–789.

Yang, D. (2008). "Coping with Disaster: The Impact of Hurricanes on International Financial Flows, 1970–2002." *The B.E. Journal of Economic Analysis & Policy 8* (1 (Advances), Article 13.

Yang, D., & Choi, H. J. (2007). "Are Remittances Insurance? Evidence from Rainfall Shocks in the Philippines." *World Bank Economic Review* 21 (2): 219–248.

Zouri, S. (2020). "Business Cycles, Bilateral Trade and Financial Integration: Evidence from Economic Community of West African States (ECOWAS)." *International Economics* 163: 25–43.

APPENDIX

– Chapter 1 appendices

Table A1. 1: Unit root test

	Level						
	LLC		IPS		PP		Decision
	Stat	P-value	Stat	P-value	Stat	P-value	
GDP/head	-2.1486	0.0158	-2.0110	0.0222	-0.8953	0.1853	I(1)
TFM	1.00679	0.8430	0.8741	0.8090	-0.8289	0.2036	I(1)
DEVFI	-2.0944	0.0181	-1.7567	0.0395	-0.3758	0.3535	I(1)
Inf	-1.5605	0.0593	5.4132	1.0000	5.3723	1.0000	I(1)
TCE	-1.1553	0.1240	-1.4337	0.0758	-0.5589	0.2881	I(1)
Pop	6.0269	1.0000	0.1651	0.5656	-0.9590	0.1688	I(1)
Trade	1.3067	0.9043	-2.1437	0.0160	-1.7734	0.0954	I(1)
Invpr	-1.0468	0.1476	-2.2348	0.0127	-0.5181	0.3022	I(1)
Conspr	-2.2045	0.0137	-1.3752	0.0845	-1.3295	0.0918	I(1)

Source: Author, based on World Bank data.

Table A1. 2: Cross-correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) GDP/head	1.000								
(2) TFM	-0.046	1.000							
(3) DEVFI	-0.012	0.100	1.000						
(4) Inf	0.024	0.061	-0.222	1.000					
(5) TCE	0.206	-0.143	-0.246	0.372	1.000				
(6) CONPR	-0.296	0.011	0.045	-0.199	-0.311	1.000			
(7) INVPR	0.228	0.100	0.064	0.311	0.207	-0.528	1.000		
(8) Ouv	0.198	-0.063	-0.067	0.082	0.262	-0.842	0.011	1.000	
(9) Pop	0.090	-0.013	-0.087	-0.200	0.099	-0.425	0.303	0.262	1.000

Source: Author's calculations, based on World Bank and World Outlook data.

Table A1. 3 : Test de cointégration de Johansen Fisher sur données de panel

Johansen Fisher Panel Cointegration Test
Series: PIB_TETE TFM DEVFI INF TCE CONPR INVPR OUV POP
Date: 12/15/22 Time: 04:00
Sample: 1985 2019
Included observations: 210
Trend assumption: Linear deterministic trend
Lags interval (in first differences): 1 1

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.

None	96.81	0.0000	175.6	0.0000
At most 1	173.8	0.0000	66.06	0.0000
At most 2	97.52	0.0000	42.77	0.0000
At most 3	60.70	0.0000	32.89	0.0000
At most 4	32.15	0.0000	16.35	0.0120
At most 5	18.97	0.0042	6.593	0.3602
At most 6	15.83	0.0147	7.759	0.2563
At most 7	13.19	0.0401	9.403	0.1522
At most 8	13.83	0.0317	13.83	0.0317

* Probabilities are computed using asymptotic Chi-square distribution.
Source : Author's calculations.

– Chapter 2 appendix

Table A2. 1: Results of variable stationarity test

Variables	ADF		Breitung		IPS		Decision
	Stat	P-value	Stat	P-value	Stat	P-value	
CYCLE	-8.4381	0.0000	-5.0579	0.0004	-5.8354	0.0000	I(0)
ODA	-2.1284	0.0167	-2.9950	0.0014	-2.3241	0.0101	I(0)
ODA²	-3.7565	0.0001	-2.8415	0.0022	-5.5869	0.0000	I(0)
INV	-2.5582	0.0053	0.9977	0.8408	-2.7024	0.0034	I(1)
GPOP	-7.0047	0.0000	-4.2688	0.0000	-7.8390	0.0000	I(0)
INF	3.9673	1.0000	0.1106	0.5440	4.0025	1.0000	I(1)
MM	-1.0865	0.1386	0.5562	0.7110	-1.2208	0.1111	I(1)
Trade	-1.0439	0.1483	-1.8356	0.0332	-0.9969	0.1594	I(1)

Source : Author's calculation.

Table A2. 2: Kao cointegration test based on model variables

Kao Residual Cointegration Test
Series: CYCLE ODA ODA2 INF GPOP INV Trade MM
Date: 10/02/21 Time: 02:02
Sample: 1985 2019
Included observations: 210
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
User-specified lag length: 1
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-7.267857	0.0000
Residual variance	190.5817	
HAC variance	49.97760	

Test	Calculated value	P-value	Decision
Cointegration	-7.267857	0.0000	We accept H1

Source : Author's calculation.

Table A2. 3: Summary of individual results of Toda and Yamamoto's (1995) causality test for each CEMAC country

- **Case of Cameroon**

Dependent variable: CYCLE			
Excluded	Chi-sq	df	Prob.
APD	2.7194	4	0.6058
All	2.7194	4	0.6058

Dependent variable: APD			
Excluded	Chi-sq	df	Prob.
CYCLE	14.9599	4	0.0048
All	14.9599	4	0.0048

Source : Author's calculation.

- **Case of Congo**

Dependent variable: CYCLE			
Excluded	Chi-sq	df	Prob.
APD	5.6206	4	0.2293
All	5.6206	4	0.2293

Dependent variable: APD			
Excluded	Chi-sq	df	Prob.
CYCLE	2.3205	4	0.6770
All	2.3205	4	0.6770

Source : Author's calculation.

- **Case of Gabon**

Dependent variable: CYCLE			
Excluded	Chi-sq	df	Prob.
APD	5.1181	4	0.2754
All	5.1181	4	0.2754

Dependent variable: APD			
Excluded	Chi-sq	df	Prob.
CYCLE	2.5631	4	0.6334
All	2.5631	4	0.6334

Source : Author's calculation.

- **Case of Equatorial Guinea**

Dependent variable: CYCLE			
Excluded	Chi-sq	df	Prob.
APD	5.5893	4	0.2320
All	5.5893	4	0.2320

Dependent variable: APD			
Excluded	Chi-sq	df	Prob.
CYCLE	5.0512	4	0.2821
All	5.0512	4	0.2821

Source : Author's calculation.

- **Case of Central African Republic**

Dependent variable: CYCLE			
Excluded	Chi-sq	df	Prob.
APD	0.6782	4	0.9540
All	0.6782	4	0.9540

Dependent variable: APD			
Excluded	Chi-sq	df	Prob.
CYCLE	21.9461	4	0.0002
All	21.9461	4	0.0002

Source : Author's calculation.

- **Case of Chad**

Dependent variable: CYCLE			
Excluded	Chi-sq	df	Prob.
APD	4.0217	4	0.4031
All	4.0217	4	0.4031

Dependent variable: APD			
Excluded	Chi-sq	df	Prob.
CYCLE	5.9673	4	0.2016
All	5.9673	4	0.2016

Source : Author's calculation.

Table A2. 4: Fully modified ordinary least squares (FMOLS)

Variable	Coefficient	Ecart-type	T-Statistic	Prob.
ODA	0.167371	0.145769	1.148190	0.2523
ODA2	-0.005536	0.002669	-2.074550	0.0394
INF	0.009800	0.020894	0.469028	0.6396
Trade	0.048257	0.022118	2.181801	0.0304
GPOP	0.381089	1.252319	0.304306	0.7612
MM	0.042724	0.118696	0.359942	0.7193
INV	-0.008875	0.044379	-0.199976	0.8417

R-squared	0.039469	Mean dependent var	-0.179726
Adjusted R-squared	-0.021841	S.D. dependent var	10.50006
S.E. of regression	10.61411	Sum squared resid	21179.94
Long-run variance	37.66576		

Source : Author's calculation.

Table A2. 5: Dynamic ordinary least squares

Variable	Coefficient	Ecart-type	T-Statistic	Prob.
ODA	0.169747	0.572884	0.296302	0.7683
ODA2	-0.002097	0.014162	-0.148057	0.8829
INF	0.064833	0.053818	1.204688	0.2342
Trade	-0.079440	0.053607	-1.481880	0.1449
GPOP	2.909814	2.772759	1.049429	0.2992
MM	-0.255804	0.372509	-0.686707	0.4956
INV	-0.097909	0.141475	-0.692057	0.4922

R-squared	0.873893	Mean dependent var	-0.193585
Adjusted R-squared	0.511334	S.D. dependent var	10.81794
S.E. of regression	7.562240	Sum squared resid	2744.999
Long-run variance	7.394219		

Source : Author's calculation.

– **Chapter 3 appendix: Robustness and test results**

Table A3. 1: Pesaran cross-sectional dependency test (2021)

Variables	t-CIPS	P-value
LnSyn	2.36***	0.018
LnIDE	1.89**	0.059
LnINF	22.10***	0.000
LnINV	4.34***	0.000
LnGPOP	-0.58	0.563
LnTrade	3.02***	0.003
LnMS	11.12***	0.000

**** p<0.01, ** p<0.05, * p<0.1*

Source: Author's calculations, using Stata 15.0 software

Table A3. 2: Pesaran (2007) unit root test

Variables	t-CIPS	P-value
LnSyn	-4.894***	0.000
LnIDE	-2.76***	0.000
LnINF	-2.050***	0.000
LnINV	-1.854***	0.000
LnGPOP	-2.830***	0.000
LnTrade	-2.331***	0.000
LnMS	-2.377***	0.000

**** p<0.01, ** p<0.05, * p<0.1*

Source: Author's calculations, using Stata 15.0 software

Table A3. 3: Impact of foreign direct investment on business cycle synchronization in the presence of autocorrelation and heteroscedasticity

VARIABLES	(1) LnSyn	(2) LnSyn	(3) LnSyn	(4) LnSyn	(5) LnSyn	(6) LnSyn
LnIDE	0.0520*	0.0602**	0.0607*	0.0853***	0.0719**	0.0720**
	(0.0290)	(0.0306)	(0.0311)	(0.0322)	(0.0336)	(0.0337)
LnINF		-0.0733	-0.0789	-0.168	-0.193	-0.186
		(0.132)	(0.133)	(0.137)	(0.138)	(0.134)
LnINV			0.00450	0.0196	-0.0349	0.00961
			(0.0634)	(0.0612)	(0.0728)	(0.0756)
LnGPOP				-0.265**	-0.343***	-0.369***
				(0.120)	(0.130)	(0.135)
LnTrade					0.221	0.173
					(0.157)	(0.154)
LnMS						-0.226
						(0.157)
Constant	2.250***	2.563***	2.576***	3.184***	2.593***	3.313***
	(0.0484)	(0.576)	(0.580)	(0.645)	(0.776)	(0.901)
Observations	162	162	162	162	162	162
Number of Paysid	6	6	6	6	6	6

Standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

Source: Author's calculations, using Stata 15.0 software

Table A3. 4: Effect of foreign direct investment on business cycle synchronization in the absence of autocorrelation and heteroscedasticity

VARIABLES	(1) LnSyn	(2) LnSyn	(3) LnSyn	(4) LnSyn	(5) LnSyn	(6) LnSyn
LnIDE	0.0434*	0.0418	0.0470*	0.0618**	0.0483*	0.0515*
	(0.0248)	(0.0266)	(0.0273)	(0.0277)	(0.0286)	(0.0289)
LnINF		0.0431	0.0444	-0.0148	-0.0372	-0.0204
		(0.121)	(0.121)	(0.125)	(0.125)	(0.124)
LnINV			-0.0502	-0.0236	-0.0792	-0.0538
			(0.0646)	(0.0623)	(0.0706)	(0.0737)
LnGPOP				-0.213**	-0.278***	-0.289***
				(0.0997)	(0.106)	(0.111)
LnTrade					0.228*	0.218*
					(0.128)	(0.126)
LnMS						-0.135
						(0.143)
Constant	2.267***	2.073***	2.193***	2.587***	1.960***	2.262***
	(0.0379)	(0.530)	(0.547)	(0.588)	(0.682)	(0.753)
Observations	162	162	162	162	162	162
Number of Paysid	6	6	6	6	6	6

Standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

Source: Author's calculations, using Stata 15.0 software

TABLE OF CONTENTS