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DIALLO ASKANDAROU CHEIK

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**Three essays on private capital mobility and financial
flows in Sub-Saharan African countries**

THÈSE DIRIGÉE PAR :

Mme Isabelle RABAUD

Maître de conférences HDR, Université d'Orléans

RAPPORTEURS :

Mr Cornel OROS

Professeur, Université de Poitiers

Mr Francisco SERRANITO

Professeur, Université Paris Nanterre

JURY :

Mme Camelia TURCU

Professeur, Université d'Orléans (Présidente du Jury)

Mr Cornel OROS

Professeur, Université de Poitiers (Rapporteur)

Mr Francisco SERRANITO

Professeur, Université Paris Nanterre (Rapporteur)

Mr Patrick PLANE

Professeur, Université d'Auvergne (Examineur)

Mr Luc JACOLIN

Economiste, Banque de France (Invité)

Mme Isabelle RABAUD

Maître de conférences, HDR, Université d'Orléans
(Directrice)

Trois essais sur la mobilité des capitaux privés et les flux financiers dans les pays d'Afrique subsaharienne.

Résumé :

L'économie mondiale a été caractérisée par une libéralisation accrue des marchés de capitaux au cours de ces dernières décennies. La conséquence de cette libéralisation a été une accélération du processus de mondialisation avec notamment une croissance des mouvements internationaux de capitaux et des transactions financières internationales. Sous l'effet de la libéralisation des mouvements de capitaux et de l'ouverture des marchés domestiques, les pays d'Afrique subsahariennes enregistrent de plus en plus d'importants flux internationaux de capitaux. Au cours des années 1980, les flux entrants de capitaux dans les pays d'Afrique subsaharienne étaient principalement constitués d'aide public au développement et de prêts bancaires destinés aux secteur public. Dans ces dernières années, la composition de ces flux a changé pour prendre la forme d'investissements directs étrangers et des transferts des migrants. Parallèlement à cette hausse des flux entrants de capitaux, les pays d'Afrique subsaharienne enregistrent une importante fuite des capitaux. Cette thèse qui s'inscrit donc dans un contexte économique caractérisé par une croissance importante des flux de capitaux privés dans les pays d'Afrique subsaharienne est organisée en trois chapitres qui visent à répondre respectivement aux questions suivantes : quel lien dynamique existe entre les flux des investissements directs étrangers et l'investissement privé domestique ? Dans quelle mesure un développement financier local contribue-t-il à une allocation efficace des transferts des migrants par le canal de l'investissement privé domestique ? Comment une faible régulation bancaire et financière influence-t-elle la fuite des capitaux ? Les résultats du premier chapitre montrent que les investissements directs étrangers ont peu d'effet à court terme mais stimulent l'investissement privé sur le long terme. Les résultats montrent aussi que les investissements directs étrangers interagissent avec les investissements publics nationaux pour renforcer ces effets positifs. Aussi, les résultats suggèrent que l'impact des investissements directs étrangers sur l'investissement privé domestique est plus fort dans les pays diversifiés non exportateurs de ressources naturelles que dans les pays essentiellement exportateurs de matières premières. Les résultats du deuxième chapitre montrent dans un premier temps que les transferts des migrants ont un impact positif sur l'investissement privé. Deuxièmement, l'étude montre que l'effet marginal de ces transferts sur l'investissement décroît avec le niveau du développement financier des pays. Les transferts ont un impact plus marqué dans les pays où le secteur financier est faiblement développé étant donné qu'ils réduisent les contraintes de crédits. Les résultats du troisième chapitre indiquent que la qualité de la régulation et la supervision bancaire réduit l'incitation à la fuite des capitaux dans les pays d'Afrique subsaharienne. Plus précisément, la régulation sur l'adéquation des fonds propres (à travers l'amélioration de la solidité des banques), la régulation de la concurrence bancaire (par la réduction de la concentration bancaire et l'implantation des banques étrangères), ont un impact négatif sur la fuite des capitaux. L'effet de la régulation et la supervision bancaire sur la réduction de la fuite des capitaux est particulièrement prononcé dans les pays ne disposant pas de systèmes d'assurance de protection des dépôts bancaires.

Mots clés : Flux des capitaux, Investissement Direct Etrangers, Fuite des capitaux, Transferts des migrants, Investissements privés, Afrique subsaharienne.

Three essays on private capital mobility and financial flows in sub-Saharan African countries

Abstract :

The global economy has been characterized by an increasing liberalization of capital markets in recent decades. This liberalization has led to an increase in international capital movements and international financial transactions. Due to the liberalization of capital movements and the opening up of domestic markets, Sub-Saharan African countries are increasingly experiencing substantial international capital inflows. In the 1980s, capital inflows to Sub-Saharan African countries were mainly composed by official development assistance and bank loans to public sectors. In recent years, the composition of these flows has changed to take the form of foreign direct investment and migrant remittances. In parallel with this increase of capital inflows, Sub-Saharan African countries are experiencing substantial capital flight. This thesis, which takes place in an economic context characterized by substantial growth in private capital flows in Sub-Saharan African countries, is organized into three chapters, aiming respectively to answer the following questions: What dynamic links exist between foreign direct investment inflows and domestic private investment? To what extent does local financial development contribute to the efficient allocation of migrant remittances via domestic private investment? How does weak banking and financial regulation influence capital flight? The results of the first chapter show that foreign direct investment has little effect in the short term, but stimulates private investment in the long term. The results also show that foreign direct investment interacts with domestic public investment to reinforce these positive effects. The results also suggest that the impact of foreign direct investment on domestic private investment is stronger in diversified non-resource exporting countries than in countries mainly exporting natural resources. The results of the second chapter show, firstly, that remittances have a positive impact on private investment in the region. Secondly, the study shows that the marginal effect of remittances on investment decreases with countries' level of financial development. Migrant remittances have more impact in countries where the financial sector is underdeveloped, as they reduce credit constraints. The results of the third chapter indicate that the quality of banking regulation and supervision reduces the incentive of capital flight from Sub-Saharan African countries. More specifically, regulation of capital adequacy (by improving bank soundness), regulation of banking competition (by reducing bank concentration and the entry of foreign banks), have a negative impact on capital flight. The effect of banking regulation and supervision on reducing capital flight is particularly pronounced in countries without insurance schemes to protect bank deposits.

Keywords: Capital flows, Foreign Direct Investment, Capital flight, Remittances, Private investment, Sub-Saharan Africa.

*Je dédie cette thèse à mon père Issa DIALLO, ma mère Djéneba BARRY, ma grande soeur
bien-aimée Fatimata DIALLO et son mari Monsieur Hussein MOUKBEL.*

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Abstract

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Abstract

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Keywords: Capital flows, Foreign Direct Investment, Capital flight, Remittances, Private investment, Sub-Saharan Africa.

List of Abbreviations

ARDL Auto Regressive Distributed Lag

DCs Developing Countries

ECOWAS Economic Community of West African States

FDI Foreign Direct Investment

FGLS Feasible Generalized Least Squares

GDP Gross Domestic Product

GLS Generalized Least Squares

GMM Generalized Method of Moments

ICRG International Country Risk Guide

IMF International Monetary Fund

IOM International Organization for Migration

LICs Low-Income Countries

LMICs Lower Middle-Income Countries

MG Mean Group

ODA Official Development Assistance

OECD Organization for Economic Co-operation and Development

PMG Pooled Mean Group

REO Regional Economic Outlook

SMEs Small and Medium-Sized enterprises

SUR Seemingly Unrelated Regression

UNCTAD United Nations Conference on Trade and Development

WDI World Development Indicators

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1

Chapter 0. General Introduction

1.1 Motivations to focus on private capital mobility and financial flows in Sub-Saharan African countries.

The growth of international capital flows and financial transactions is one of the most remarkable aspects of the global economy since the end of the twentieth century. These changes have been driven by powerful forces, such as economic liberalization and multilateralization in both developed and developing countries. The globalization of capital markets, a consequence of the liberalization of capital movements, has accelerated the process of integrating developing countries into the global economy. In Sub-Saharan Africa, liberalization and financial integration have become increasingly widespread over the past three decades, as a result of development strategies recommended by the International Monetary Fund (IMF) and the World Bank (WB). These development strategies involve trade and financial policy reforms aiming to improve economic growth in these countries. As a result of the liberalization of capital movements and the openness of domestic markets, Sub-Saharan African countries are experiencing substantial international private capital flows. During the 1980s, these capital flows were mainly composed by official development

assistance (ODA) and bank loans to public sectors. Since the 90s, the composition of these flows has gradually changed to take the form of foreign direct investment (FDI), migrant remittances, and the private sector has become the main beneficiary of these financial inflows. In parallel with the increase in capital inflows, Sub-Saharan African countries are experiencing substantial capital flight in line with the low quality of their capital markets and financial institutions.

Two motivations justify the relevance of a topic focusing on capital mobility and financial flows towards sub-Saharan Africa.

Firstly, this study takes place in a context characterized by significant challenges in terms of development financing in Sub-Saharan African countries. These countries need substantial resources to finance their development, but are experiencing serious financial constraints. Internally, Sub-Saharan African countries have structural characteristics that exacerbate domestic financial constraints. Domestic savings are not sufficient to support domestic investment. Savings rates are lower than in the rest of the world, despite the fact that domestic savings are a powerful means to finance development. In addition, domestic financial markets are underdeveloped, and domestic credit to the private sector remains low, making the mobilization of domestic financing weak. The mobilization of fiscal resources is constrained by the weakness of the tax base due to factors such as the predominance of an informal sector, the importance of the agricultural sector, infrastructure deficit, lack of human capital, climate change, narrow markets, weak industrial sectors, weak institutions, corruption, international vulnerabilities linked to commodity prices. These financing constraints are also accentuated by high levels of public debt in some countries. High levels of public debt raise concerns about debt sustainability, as 19 of the region's 35 low-income countries are over-indebted IMF, *Regional Economic Outlook* (2023). Sub-Saharan Africa's public debt-to-GDP ratio stands at over 50% of GDP, a level not seen since the early 2000s IMF, *Regional Economic Outlook* (2023). At the international level, cyclical factors such as the

COVID-19 crisis and the conflict in Ukraine have created negative repercussions on economic activity, with the risk of durably affecting tax revenues, thus penalizing the mobilization of domestic resources.

The second motivation justifying the choice of this topic is linked to the strong growth of capital flows in Sub-Saharan African countries over the last decades.

In terms of volume, foreign direct investment in the region has quadrupled since 1990, reaching, 3.8% of GDP in 2021 while remittances reached 2.6% of GDP World Bank , WDI (2023). Given the capital constraints in Sub-Saharan African countries due to the weakness of domestic resources, such capital flows represent a substantial source of external financing and a tool helping these countries to integrate into global economy. In parallel with the increase in capital inflows, Sub-Saharan African countries are experiencing substantial capital flight. In 2020, for example, capital flight reached over 3% of the GDP of the countries in the region UNCTAD (2020). This capital flight is highly detrimental to the region's economies. It has a negative impact on macroeconomic stability and economic growth, by reducing the resources available for investment and development financing.

Several factors can explain the growing trend of capital inflows and flight observed in the since the 90s.

FDI growth can be explained by the fact that Sub-Saharan African countries have undertaken a series of structural policy reform under the aegis of the World bank and the IMF since the 1990s. Thanks to the launch of privatization programs, the modernization of investment codes and the adoption of international agreements on FDI, the quality of conditions offered locally to businesses, the efforts made by governments to encourage trade liberalization, and the development of priority projects with a broad economic impact, these policies have helped to build confidence in the macroeconomic and institutional management of several countries. On the external front, external business cycles and other structural influences played a substantial role in driving private capital inflows. Rising demand for

commodities, particularly in energy, led to increased foreign direct investment in natural resources. The reconfiguration of worldwide value chains and the growing importance of regional value chains have opened up new opportunities and facilitated FDI flows to Sub-Saharan African countries. Other external structural forces, such as intense competition and rising costs in domestic markets, and falling communications costs, have encouraged firms in industrialized countries to increase their production abroad through FDI in order to boost efficiency and profitability. Added to this, institutional investors have become more willing to place their investments in developing country markets because of the higher rates of return expected in the long term, and the expansion of risk diversification opportunities thanks to the liberalization of capital accounts in Sub-Saharan African countries.

When it comes to remittances, the growing trend is largely due to the increase in the number of migrants since the mid-1990s IOM (2022). The integration of migrants in host countries and the increase in the number of skilled migrants have also led to an rise in remittances Mouhoub mouhoud (2016). The emergence of new information and communication technologies has also played a significant role in migrant remittances. Mobile phones, internet and social networks have become the instruments linking migrants to their communities of origin. The emergence of these new technologies has led to the growth of money transfer operators, facilitating international transactions. With the evolution of transfer industry over the past two years, both individuals and even small and medium-sized businesses can now take advantage of faster, cheaper money transfer services abroad. Competition between money transfer companies has grown considerably in recent years in Sub-Saharan Africa. In addition to market giants such as Western Union, Money Gram, RIA, other less expensive companies have emerged. Among them are World Remit and Wizall Money. These applications have played a major role in the growth of money transfers to Sub-Saharan Africa. Although still exorbitant, the commissions charged by the giants of the

sector have been on a downward trend due to competition and pressure from the G20 and the United Nations 'UN).

When it comes to the increase of capital flight towards Sub-Saharan African countries since 1990, the literature explains it by factors such as: corruption, exchange controls, political instability, inflation and the lack of capital protection. In particular, corruption is seen as a facilitating factor of capital flight, as corrupt African leaders and officials who have siphoned funds off can only hide them abroad. Corruption, the failure of justice, the absence of the rule of law, and the predatory nature of certain laws and regulations create legal insecurity and explain capital flight. Political instability, because of the uncertainty and insecurity it creates, is also a factor favoring capital flight. Inflation, combined with exchange controls, are also significant factors. High inflation leads to a loss of purchasing power for capital. It leads to a lack of investor confidence in the currency, as it erodes the real value of their capital or assets. The exchange and capital control policies adopted in certain countries in the region do not facilitate formal operations by investors in foreign currency, which may explain why they resort to informal and clandestine channels that accelerate capital flight.

These capital flows pose considerable macroeconomic challenges for Sub-Saharan African countries.

In the context of Sub-Saharan African countries, where domestic savings are limited due to the lack of domestic resources, capital inflows can increase the savings available to finance investment. Capital inflows, by diversifying sources of financing, can enable Sub-Saharan African economies to achieve sustainable current account and balance of payments deficits in the medium-to-long term, particularly if it is financed by FDI. Similarly, given that Sub-Saharan African countries are exposed to negative cyclical income shocks, capital flows can facilitate the implementation and financing of counter-cyclical economic policies, offering an alternative to the contraction of domestic demand. Capital inflows can also facilitate the financing of trade operations with the rest of the world, via the opening

up of trade that benefits growth through competition and technology transfers through FDI. With regard to remittances, they can play a substantial role in offsetting balance of payments deficits. Since savings in these countries is generally insufficient to finance investments, these funds constitute inflows of foreign currency, helping to cover the balance of payments deficit. Remittances can also act as a shock absorber, smoothing household consumption when the recipient economy is affected by an economic slowdown. They reduce income volatility and inflationary pressure in receiving countries Barajas et al. (2009); Naiditch (2009). In this way, they have a counter-cyclical effect, acting as insurance against macroeconomic shocks. They can also provide consumption and output stability to counter price volatility. Households receiving remittances can also use them to invest in human capital, such as education, health and productive nutrition, thereby affecting long-term economic growth and reducing poverty Adams Jr (2004); Docquier et al. (2012).

At the same time, capital inflows, especially when abundant, create numerous challenges and can complicate macroeconomic management. In the context of liberalization, capital flows accelerate the international transmission of shocks, as well as increasing the risk of overheating and boom cycles, with destabilizing consequences for the balance of payments of Sub-Saharan African countries. Strong capital inflows can generate upward pressure on real exchange rates. This can lead to losses in competitiveness and balance of payments problems. These flows also expose countries to international financial cycles. Financial integration, through the increased openness of countries' capital accounts, has as its corollary the exposure of their economies to international financial cycles. Empirical findings show that the scale and direction of international capital inflows are not only linked to the economic fundamentals of host countries, but also to global factors. In terms of capital flight, it has a negative impact on the region's countries. Its impact is particularly evident on domestic investment. In the context of low domestic resources in Sub-Saharan Africa, capital flight represents a reduction in national private and public savings, which is detrimental to national

capital accumulation. High levels of capital flight are also a source of macroeconomic uncertainty. It is perceived by domestic agents as a sign of failure of macroeconomic policy and of the institutions responsible for economic regulation. Capital flight increases the risk of government insolvency due to erosion of the tax base and misappropriation of public funds Ndikumana (2014). As a result, private actors may worry about a future increase of taxes, triggering a flight abroad in order to protect their assets. Consequently, demand for domestic assets would fall, leading to a decline in private domestic investment. Lower public revenues would lead to lower public investment. The overall effect would be a fall in total national investment.

In view of these complex interactions, and given the lack of consensus in the empirical literature on the impact of capital flows on developing countries, this thesis looks at the issue from the point of view of Sub-Saharan African countries. The thesis is organized into three chapters, which aim to answer the following questions:

- What is the link between foreign direct investment flows and domestic private investment? Is the FDI-domestic investment relationship static or dynamic? Do crowding-out and crowding-in effects exist?

- To what extent does local financial development contribute to the efficient allocation of migrant remittances via domestic private investment?

- How does weak banking and financial regulation influence capital flight?

1.2 Capital flows: what do we know about foreign direct investment, remittances and capital flight?

1.2.1 Foreign direct investment.

The particular attention paid by developing countries to foreign direct investment has led to a growing interest in the theoretical and empirical literature on the effects of FDI on the economic development of recipient countries. A large number of theoretical and empirical studies have attempted to understand the impact of FDI in developing countries. From the point of view of endogenous growth theories, FDI has a positive effect on economic growth. According to these theories, developing countries can only catch up economically through the acquisition and adoption of new technologies via international trade and FDI, which remains the least costly solution to the adoption of new technologies. In this respect, research carried by Alfaro et al. (2004); Baldwin et al. (2005); Barro and Sala-i Martin (1992); Berthélemy and Demurger (2000); Borensztein et al. (1998); Romer (1987), has shown that FDI stimulates growth by increasing the stock of knowledge in host countries. According to these theories, FDI is seen as one channel, among others, that enables the transfer of technologies to developing countries. However, FDI can only play its full role in stimulating growth in recipient countries if certain conditions are met, such as the country's absorption capacity, trade openness, level of infrastructure, quality of institutional governance, workforce skills and financial development. The rationale behind these theories is that growth in developing countries depends on their ability to adapt and take advantage of the technology available in developed countries.

On the empirical side, a large number of studies have also attempted to estimate the effect of FDI on economic growth in developing countries Alfaro et al. (2004); Blomstrom et al. (2000); Carkovic and Levine (2002); Ciruelos and Wang (2005); John (2016); Jugurnath et al.

(2016); Meschi (2006); Ngouhouo (2008); Tomi and D'Estaing (2015); Vu and Noy (2009); Woo (2009). Some of this literature has found a positive effect of FDI in developing countries. Positive effects can be direct or indirect. Directly, through their contribution to value added and the productivity gains generated by technology transfers to local companies acquired or integrated into production chains. Indirectly, through the externalities they generate via sourcing and supply agreements with local firms, the intensification of international trade, and the enhancement of human capital. More generally, the majority of these studies show that, with the the right policies in developing countries, FDI facilitates integration into international trade and helps create a more competitive climate for domestic companies in these countries. Similarly, empirical literature has highlighted the role that FDI inflows can play in the structural transformation of developing countries, by encouraging the export of more sophisticated products through the creation of value-added in export products and also through imports of capital goods needed for domestic industries Tomohara and Takii (2011).

However, the impact of FDI in developing countries may be limited when recipients direct it towards the consumption of imported products, to the detriment of domestic products. This leads to an appreciation of the real exchange rate: known as "Dutch disease". The result is a deterioration in the competitiveness of the domestic economy, worsening the external deficit and the balance of payments imbalance Biswas and Dasgupta (2012); Sinha et al. (2019). Adverse outcomes can occur when FDI is concentrated primarily in natural resource extraction, where exports of raw materials may eventually hinder the diversification of the productive system Combes et al. (2016). Negative effects can also arise if FDI consists of a pure transfer of assets from the public to the international private sector, for example during a privatization process.

Regarding the determinants of FDI in developing countries, the literature shows that characteristics such as the macroeconomic environment, as well as the host country's comparative advantages, such as infrastructure and skilled labor are decisive Tapsoba (2012).

Similarly, institutional factors such as corruption, political risk, intellectual property rights and bureaucracy are also determinants in developing countries Anyanwu and Yameogo (2015). Fedderke and Romm (2006) have proposed to divide the determinants of FDI into political and non-political determinants. Political determinants can include infrastructure, corporate tax rates, restrictions on foreign direct investment, trade openness, labor market arrangements, product market regulations and trade barriers. Natural resource endowment is an important factor often considered in studies of FDI catalysts in developing countries Anyanwu (2012); Fiodendji (2016); Jadhav (2012); Onyeiwu (2015).

1.2.2 Remittances.

The impact of remittances on the economic development of countries of origin is the subject of mixed debate in the literature. Studies investigating the effect of remittances do not provide definitive conclusions. The literature shows that remittances do not automatically act as catalysts of development. The effects of remittances can be positive or negative. Positive effects occur when transfers help reduce poverty Adams Jr and Cuecuecha (2013); Akobeng (2016); facilitate human capital accumulation Combes and Ebeke (2011); increase investment Giuliano and Ruiz-Arranz (2009); or improve total factor productivity Abdih et al. (2012). More generally, the literature has shown that for developing countries, transfers have the advantage of being counter-cyclical, as they increase in the event of economic slowdowns or macroeconomic shocks. Remittances are also a significant source of foreign currency, boosting national income and financing part of the imports needed for growth. Remittances also help maintain household consumption and prevent domestic demand from falling.

Other authors have highlighted various negative effects. Remittances can considerably reduce a country's competitiveness through an appreciation of the real exchange rate and an acceleration of inflation in countries characterized by the low flexibility of their productive apparatus Bourdet and Falck (2006); Khan and Islam (2013). This is particularly the case

when they induce an increase in demand that exceeds the economy's production capacity. This effect is known as "Dutch disease". It can lead to pressures on the balance of payments, create external imbalances and slow a country's economic growth. Remittances can also reduce the work effort of households, creating moral hazards and a culture of dependency that translates into vulnerability Chami et al. (2005); El Hamma (2017); Gubert (2005). Remittances can increase demand for imported goods to the detriment of locally produced goods, and would not have multiplier effects on the economy Adams Jr (2004).

Remittances are motivated by the following factors: altruism, self-interest, family contract (co-insurance, loan repayment). In the altruistic model, migrants are concerned with the economic situation of their families left behind. Sending remittances enables recipient households to overcome episodes of adverse income shocks. In this way, remittances increase as migrants' income in host countries rises. The altruistic model considers that migrants' satisfaction is linked to the well-being of their families left behind. Thus, the model assumes that remittances are positively correlated with the migrants' income and negatively correlated with the income of their families, i.e. that remittances tend to increase as migrants' income rises. When migrants go to a country where the average wage and per capita income are higher than at home, their income level, once they get a job, may be better than that of workers at home Lucas and Stark (1985). The main prediction of the altruistic model is that remittances tend to decrease over time, as attachment to the family gradually weakens when members stay in different countries for long periods. Under the self-interest hypothesis, migrants send money to their families for investment in assets in their countries of origin, or because of expectations in terms of social prestige or political influence. In contrast to the altruistic motivation, migrants send money to their country of origin primarily for financial and economic reasons. Migrants save money in foreign countries, which creates the need to accumulate wealth in their country of origin by purchasing property, land and financial assets, where these assets can generate a higher rate of return than in the host country.

As these two motivations are not sufficient to explain migrants' remittance decisions, Stark (1991) consider tacit family arrangements such as co-insurance and loan repayments as being important as well. In the co-insurance model, households whose members have migrated are expected to support other family members. If a migrant has received financial support during his education or unemployment, he should now play the role of insurer for other members of the domestic family through risk diversification. Migrants' countries of departure are generally developing countries. Thus, insurance and capital markets are incomplete, and risks cannot be diversified due to the absence of financial assets. Borrowing constraints also limit the ability to smooth consumption or finance investment. Migrants will therefore help support their families at home in difficult times. Similarly, for migrants, having a family in their country of origin is an insurance policy against the bad times that can also occur in the host country. In this model, migration becomes a co-insurance strategy, with remittances playing the role of an insurance claim. Migrant remittances may also serve to repay loans invested during his education and emigration expenses. The amount of remittances increases with the loan agreements. In this model, the theory assumes that a family develops an implicit contract with the migrant who chooses to live abroad, and those who remain in the country of origin. The implicit contract has an intertemporal dimension and combines elements of investment and repayment. According to loan repayment theory, the family invests in the emigrant's education and generally finances the costs of migration. The repayment phase comes after the migrant has settled abroad, his income profile begins to increase over time and becomes able to start repaying the loan to the family in the form of remittances. In this way, the family invests in a higher return asset and expects a positive return on its investment. In this model, remittances are a function of the time it takes for the migrant to integrate into the labor market abroad, and the length of his or her stay abroad.

When it comes to the determinants of remittances, they are both macroeconomic and microeconomic. At the macro level, the economic and political situation prevailing in the host

country and the country of origin is a determining factor in remittance. At the micro level, several factors have been identified as determinants of remittances. The human capital of migrants influences the probability of sending money to the country of origin. Well-educated and trained migrants are more likely to hold well-paid jobs, which increases the likelihood of sending remittances in larger amounts. The migrant's situation and living conditions also influence the likelihood of sending remittances. The recipient household's income and financial situation play a decisive role in the likelihood of receiving remittances. The level of education and the number of workers in the household influence the probability of sending money. Demographic characteristics, such as family relationships between the migrant and the recipient household, are important factors that increase the likelihood of transferring money. The age of the migrant plays a very important role in the decision to send remittances: the older the migrant, the more money he will send because of his responsibility to the family left behind. If the migrant has a wife and children at home, the likelihood of sending money is much higher than if he is single or elderly. In addition to the migrant's age, the location of his family also influences the decision to transfer money. If the migrant intends to settle permanently in his host country and repatriates his family through family reunification, the probability of transferring money to his country of origin will be lower, and even if he continues to do so, the amount will be modest and less regular.

1.2.3 Capital flight

When it comes to capital flight, there is no consensus on its definition in the literature. Cuddington (1986) defines capital flight as a short-term outflow of private capital in response to "*political crisis or economic policy failure*". Deppler and Williamson (1987) consider capital flight to be "emphthe acquisition or holding of a non-resident asset because the owner expects the value of his assets to decline if the asset continues to be held in a domestic market". Pastor Jr (1990) defines capital flight as an outflow of resident capital, where capital

can be represented by any assets that local residents have sent abroad to avoid domestic regulation. According to Cooper et al. (2000), capital flight is the flow of financial assets from one country to another that arises from the holder's perception that capital is exposed to a high level of risk due to hyperinflation, devaluation and political disorder. Capital flight is considered to be the portion of domestic savings that escapes the economic circuit Boyce and Ndikumana (2012). These definitions do not distinguish between licit and illicit outflows, which are difficult to determine. In the literature, some authors generally consider that licit outflows should not be considered as capital flight. Others consider as capital flight any normal or abnormal outflow of capital Guaranty (1986); Hermes et al. (2002); Kindleberger (1987); Ndiaye (2011); Walter (1987). According to these studies, normal capital outflows are based on considerations of diversification of residents' portfolios or on the activities of domestic commercial banks aiming to expand their assets abroad, whereas the phenomenon of capital flight is linked to very high uncertainty and risk on the domestic assets of residents who flee a country with the aim to avoid losses on their wealth. However, it is extremely difficult to distinguish empirically between normal and abnormal capital outflows. Thus, several authors consider capital flight to be indistinguishable from normal capital outflows Guaranty (1986)

Since there is no consensus on the definition of capital flight, it is difficult to measure. Consequently, several measures of capital flight are available in the literature. Three main measures are widely used in the literature. These measures are direct, indirect and hybrid. In general, the following methods of measuring capital flight can be distinguished in the literature: the residual method, Morgan Garantie's method, Dooley's method, the hot money method, and the false commercial invoicing method. Direct measurement involves the use of direct data from the balance of payments, focusing on short-term outflows. This method, known as the hot money method, has been developed by Cuddington (1986). Capital flight is then measured by adding together net errors and omissions and short-term capital

outflows from the non-bank private sector. This measure reflects the idea that capital flight is not registered, due to its illegal nature. The idea is that unregistered capital movements appear in net errors and omissions. Furthermore, by focusing on short-term flows, medium- and long-term outflows are excluded. Medium- and long-term flows are excluded because, according to the author, they are more normal in nature. The indirect measure of capital flight is the residual method developed by Cuddington (1986). The method is based on the assumption that a country's capital flight is given by the sum of net short-term capital outflows from the non-banking private sector, plus recorded errors and omissions, which are the gaps. With this method, capital flight is measured indirectly from balance-of-payments statistics by comparing the sources of capital inflows and outflows such as net increases in foreign debt and net inflows of foreign investment with the destination of these inflows such as the current account deficit and foreign exchange reserve inflows. The differences that arise when the sources exceed the uses of capital inflows are called capital flight. This method remains the most widely used by economists when it comes to measuring capital flight in a country Ndiaye (2011); Ndikumana and Boyce (2010). Dooley (1988) proposed a hybrid measure of direct and indirect methods which aims to differentiate between normal and abnormal or illegal capital flows. According to this method, capital flight corresponds to the total amount of a private sector's assets held abroad that do not generate income in a country's balance of payments statistics. Capital flight is therefore calculated as the difference between total external capital flows and the change in the stock of external assets. Another widely used method to measure capital flight is the trade transaction falsification method De Boyrie et al. (2005); Hermes et al. (2002). According to this method, capital flight is determined by comparing the trade data of two importing and exporting countries. The basic idea is that importers are assumed to be involved in capital flight when they declare higher values of imported goods compared to the value declared of the same goods by exporters. In turn,

exporters are involved in capital flight when they report lower values of exported goods compared to the value declared of the same goods by importers.

1.3 The added value of this thesis.

The first chapter of our thesis focuses on the effects of FDI on domestic investment in Sub-Saharan African countries. The choice of domestic investment is motivated by the fact that it is a fundamental determinant of economic growth. When it comes to domestic investment, Sub-Saharan Africa registers low levels compared with other developing regions (World Bank, WDI, 2023). In fact, since the early 90s and unlike other developing countries, the region has undergone a period of significant deindustrialization Clark (2019). This has led to a weak productive structure in African countries and the emergence of a large informal economy. In Sub-Saharan Africa, investment has remained predominantly agricultural or concentrated in the public service sector. It is therefore essential to know how FDI affects domestic investment and its sectoral distribution. In this context, the aim is to understand how FDI affects local businesses in terms of investment. Two potential channels of interaction have been highlighted in the empirical literature. The first shows that FDI develops spillover effects and external productivity effects. They encourage the transmission of best practices and ensure technological spillovers, particularly for local companies. This hypothesis suggests that FDI stimulates local investment. Sufficiently competitive local companies can still react to FDI inflows by increasing and discounting their capital stock. To the extent that FDI uses local inputs, investment by domestic suppliers in upstream sectors may also be stimulated Cardoso and Dornbusch (1989). A second interaction mechanism occurs in the financial market, where FDI can improve domestic firms' access to financing. As international capital flows, FDI increases local liquidity, promotes currency appreciation and lowers interest rates Du et al. (2014). However, FDI can also be a substitute to domestic investment, when it takes place in economic sectors where there are already many domestic

companies. The competition created by the arrival of FDI can penalize domestic investment, since multinational companies often benefit from more solid experience and diversified activities, which can generate lower production costs than local companies. The impact of FDI on local investment also depends on a number of factors. These factors include the specific characteristics of each country, depending on the economic policies implemented, institutional development, economic stability, infrastructure improvements, the type of FDI the country mainly receives, and the profile of the country's companies. For Sub-Saharan African countries, although the literature on the effect of FDI on economic growth is abundant, the interaction between FDI and domestic investment has so far attracted very little attention, even though domestic investment is the main transmission channel. For Sub-Saharan African countries, although the literature on the effect of FDI on economic growth is abundant, the interaction between FDI and domestic investment has attracted limited attention, despite the fact that domestic investment is the main transmission channel. The aim of the first chapter of this thesis is therefore to contribute to this literature through three innovations. Firstly, by using an econometric model to distinguish between the short-term and long-term effects of foreign direct investment on domestic private investment. This strategy is necessary to identify the various, sometimes contradictory, effects of FDI on national private investment. This is based on the fact that FDI cycles, particularly for greenfield investments, can be implemented over several years, and their effects on domestic investment, production and the structure of the economy can occur, over time, over the long term. The second contribution comes from the fact that, unlike previous work using total investment as the explained variable, we disaggregate it. Investment is represented by total gross fixed capital formation, which includes both public and private investment. The distinction between the two is important. It is a necessary step, in our view, to avoid aggregation bias, since the impact of FDI on domestic investment may be different for private and public domestic investment Saglam et al. (2011) and for public investment.

The results we obtained show that FDI has little effect on private investment in the short run but significant crowding-in effects in the long-run. Our results also show that FDI interacts with public domestic investment to boost these positive effects. Finally, we show that the impact of FDI on domestic private investment is stronger in non-natural resource exporting diversified countries as opposed to non-diversified commodity exporters.

The second chapter aims to understand whether the development of the local financial sector is a precondition for migrant remittances to boost domestic private investment in Sub-Saharan Africa. As mentioned above, remittances flowing to Sub-Saharan Africa have risen over the past three decades. In the literature, studies on the effect of remittances on economic growth has received particular attention in recent years Abduvaliev and Bustillo (2020); Cazachevici et al. (2020); Eggoh et al. (2019); Lucas and Stark (1985); Stark (1991); Sutradhar (2020). Meanwhile, most empirical studies seem to neglect the domestic investment channel, which is nonetheless the key determinant of economic growth. In addition, the majority of these studies have focused on direct effects without taking into account possible indirect or conditional effects, whereas remittance flowing increases the volume of disposable income and savings. They can therefore stimulate investment, and hence economic growth. At the macroeconomic level, remittance tends to be more stable than other sources of foreign currency, and their variation is often counter-cyclical, helping to maintain stability, an essential factor in investment . They also improve the solvency of countries by increasing the level and stability of their foreign currency reserves. At the micro level, remittances can potentially have an impact on domestic investment, by minimizing consumption volatility and diversifying and stabilizing household incomes. At the same time, the inflows of remittances can reduce a country's competitiveness and discourage investment through exchange rate appreciation. On the basis of these observations, we seek to understand the extent to which financial development may determine the effect of remittances on domestic investment in sub-Saharan African countries. There are several reasons motivating the

choice of financial development. Firstly, because a well-developed and functional financial sector is essential for good investment growth, as it helps produce essential information for investment, improve the efficiency of allocation and saving, and manage risk Adenutsi (2011); Balassa (1990); Cazachevici et al. (2020). In this way, the financial sector offers a channel through which remittances can be mobilized and channeled into productive investment. The second motivation is linked to the conditions of financial development in Sub-Saharan Africa. The region's financial sectors have made great strides since the early 1990s as a result of financial liberalization policies. Nevertheless, these sectors remain more limited than in other developing regions. Credit constraints remain high, and financial markets are shallow. Businesses, entrepreneurs and households are experiencing difficulties to access financing in many countries, even with limited maturities, reflecting the obstacles that remain to be overcome for long-term loans and credit. Banks remain the dominant institutions providing credit, mainly to large companies. Non-bank financial intermediaries, notably the microfinance and insurance sectors, have also grown rapidly, but the size of these sectors relative to GDP and population remains small. Under these conditions, we hypothesize that the growing volume of remittances to Sub-Saharan African countries could potentially interact with the financial sector and impact domestic investment. Given domestic financial constraints, remittances could potentially enable households to access financial services. In addition, since remittances also appear to be more stable than other foreign capital flows and often evolve counter-cyclically, they can increase banks' loanable funds and thus domestic credit Aggarwal et al. (2011) thus impacting domestic investment. Remittances could also create a need for financial products among recipient households, making them eligible to access savings products offered by financial institutions and thus increasing the likelihood of recipient households obtaining investment loans Anzoategui et al. (2014). This can therefore improve the financial inclusion of recipient households and facilitate their need for investment.

The results obtained show that, firstly, remittances have a positive impact on private investment in the region. Secondly, the study shows that the marginal effect of remittances on investment decreases with the level of financial development of countries. Remittances have a stronger impact in countries where the financial sector is underdeveloped, as they constitute a credit constraint. A high level of financial development reduces the role of remittances in investment.

The third chapter analyses the relationship between capital flight and banking regulation. As mentioned above, capital flight is a serious concern for Sub-Saharan African countries. In the literature, a large number of studies have attempted to identify the major causes of capital flight. These works identify two major causes that may explain it: macroeconomic and political instability Collier et al. (2004); Cuddington (1986); Dooley (1988); Hermes and Lensink (2001); Ndikumana (2014). The high level of capital flight from in sub-Saharan African countries seems, however, to be paradoxical and in contradiction with theoretical and empirical predictions which explain such phenomenon by macroeconomic and political instability. Indeed, various World Bank and IMF reports indicate that, in macroeconomic terms, the countries of Sub-Saharan Africa as a whole are experiencing stability as a result of various reforms undertaken since the 1990s. On the political side too, the region has not experienced severe political instability in recent years, which would justify such a large capital flight. Given this paradox, we have decided to focus on the role of banking sector regulation and supervision, because, in our view, the banking sector should not be seen as a passive player in the analysis of capital flight in Sub-Saharan Africa. Indeed, it has a number of characteristics that can potentially facilitate capital flight. In many countries, there are weaknesses in banking regulation and supervision. In Sub-Saharan Africa, banking system is relatively underdeveloped in terms of depth and penetration. It is characterized by weaker banking competition than in other developing and high-income regions. The sector faces challenges related to the adoption of banking technology and innovation. Deposit

protection insurance systems are absent in many countries. Although they are recognized as a valuable component of an effective financial security network in the economies of countries with stable financial systems, their penetration in Sub-Saharan Africa remains low. These deposit insurance schemes are designed to limit the possibility of banking panics precipitating systemic crises. To fulfill this objective, deposit insurance covers depositors when their bank becomes insolvent. However, financial stability also implies the need to avoid a high level of moral hazard, which is generally the hallmark of any insurance system. In addition, since a large number of sub-Saharan African countries depend on the export of raw materials, banks tend to be more exposed to commodity prices. This makes the banks' financial situation closely dependent on fluctuations, and weakens their stability. The banking sector has also experienced major changes in recent years. These changes pose major challenges in terms of banking stability and regulation. In particular, the banking sector has been transformed by the growing involvement of foreign banks. These foreign banks have increased competitive pressure in the sector and encouraged the adoption of new banking techniques. In this context of rapid change, weaknesses in regulatory systems can further undermine confidence in national banks and accentuate capital flight. It is also important to note that Sub-Saharan African countries are confronted with money laundering, which facilitates capital flight. Banks are not indifferent to money laundering Moshi (2007). Most countries in the region have regulations in place to combat money laundering. However, the effectiveness of these regulations may be called into question by certain secretive jurisdictions. Banks with secret jurisdictions play an important role in facilitating the concealment or laundering of money from Sub-Saharan Africa Kapoor (2007). These secret jurisdictions are characterized by low transparency in the financial and banking sector, which facilitates money laundering and capital flight. Low transparency of financial information can enable companies, criminals and high-level politicians to conceal their activities and illegally acquired capital. This is particularly true of public funds leaving countries in the form of private assets.

The results obtained in this chapter indicate that the quality of banking regulation and supervision reduces the incentive of capital flight from Sub-Saharan African countries. Specifically, we find that regulation of capital adequacy (by improving bank soundness), regulation of banking competition (by reducing bank concentration and improving foreign bank entry), have a negative impact on capital flight. The effect of banking regulation and supervision on reducing capital flight is particularly pronounced in countries without insurance schemes to protect bank deposits.

2

Chapter 1. Foreign direct investment and domestic private investment in Sub-Saharan African countries: crowding-in or out?

Joint work with Isabelle RABAUD and Luc JACOLIN¹.

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2.1 Introduction

Over the last three decades, FDI has grown to be one of the three major sources of external financing in Sub-Saharan countries (SSA), along with remittances and official development aid. In 2020, FDI inflows towards Africa have been more resilient with a drop of 18% (versus -42% worldwide), despite a collapse of 63% of Greenfield project announcements UNCTAD (2021). FDI represents a long-run source of capital for investment and economic development, seen by national authorities as essential to alleviate domestic capital accumulation constraints and spur private sector growth. The expected impact of greenfield FDI on domestic investment

¹Banque de France

²<https://publications.banque-france.fr/en>

and growth has provided the rationale for FDI promotion policies (investment codes, tax breaks in an attempt to better integrate African countries in Global Value Chains). Such policies were encouraged seeking to leverage increasingly constrained official development aid. However, the positive impact of FDI on investment and growth has proved to be more elusive than expected in the current economic literature.

Seminal research has established the clear link between FDI and growth Romer (1986). FDI stimulates economic growth either through their direct impact on overall investment or by generating positive spillovers. These positive effects stem from market entry from multinational companies, which spread new production processes and technologies, new products and management skills. As some multinational firms acquire labour and raw materials locally, they are potentially sources of new demands for local inputs to local firms and the creation of labour income that stimulate local demand and encourages domestic investment. FDI inflows can also be a source of network effects and agglomeration economies, which attract additional foreign investors and create complementarities with domestic firms Markusen and Venables (1999). Domestic firms may respond to FDI inflows by renewing and increasing their capital stock in order to face competition De Mello (1999). Massive FDI inflows may also trigger large local or regional investments in infrastructure that increase the profitability of domestic investment Cardoso and Dornbusch (1989).

Other literature strings point to possibly negative impacts of FDI on domestic investment and growth. Since foreign firms are generally technologically superior, they may take advantage more rapidly and efficiently of opportunities that were formerly only accessible to domestic investors Agosin and Mayer (2000); Fry (1993). FDI inflows may lead to a reduction of the market share, or market exit, of some domestic firms, particularly with significant technological gap between foreign and domestic firms and lack of skilled workers in the host country Borensztein et al. (1998). FDI can affect domestic investment and growth negatively when exchange rate appreciates after these financial inflows, or "Dutch

disease" associated with FDI in extraction industries Cordon and Neary (1982) . FDI flows may increase current account imbalances by increasing imports and worsening the terms of trade Apergis et al. (2006), reducing the potential domestic productivity advantage, raising prices of capital goods and leading to a fall in domestic investment. Meanwhile, the real effective exchange rate appreciation from FDI inflows and associated exports may reduce the competitiveness and investment of other tradable goods sectors.

Since the early 2000s, a growing body of empirical literature has tried to disentangle such possible crowding-in or crowding-out effects in recipient countries to assess the dynamic net effect of FDI on domestic investment. First, the empirical evidence remains ambiguous because this net impact depends on significant host country-specific characteristics. Such effects include differences in the quality of governance and local policies to stimulate FDI, the degree of financial development Alfaro et al. (2004), the size of the technological gap between multinational and domestic firms and the absorptive capacity of local firms Barrios et al. (2005). Second, the impact of FDI on domestic investment also depends on sectoral composition and linkage effects which may differ widely between primary, manufacturing and services sectors UNCTAD (2021). Compared to similar investments in the primary sector, FDI flows in manufacturing may have a greater impact on the economy through many potential linkage-intensive activities. As the service sector includes a wide range of different activities such as wholesale and retail trade, finance, infrastructure, real estate and tourism, FDI in this sector may benefit domestic investment through strong backward linkages. Third, the impact of FDI on domestic investment and growth may be higher and more rapid for greenfield form versus Mergers and Acquisitions. The latter does not immediately increase the host country's productive capacity unless it is accompanied by expansion and new investment Agosin and Machado (2005). However, in the long run it can improve productivity if the firms acquired make new investments (e.g. privatisation of public utilities). Finally, FDI flows may have opposite effects on domestic competition, depending

on the intensity of the latter and competitive behaviour of both multinational and domestic firms. Some empirical literature shows significant crowding-out on domestic firms upon entry of multinational enterprises Mišun et al. (2002).

The variety of these possible effects on the magnitude, direction and timing of these determinants, may explain the high variability of empirical results found among developing countries. Agosin and Mayer (2000) found that crowding-in effects benefited Asian countries, and to a lesser extent African countries, whereas crowding out effects were dominant in Latin America. Apergis et al. (2006) also find a crowding-in effect for Asian and African countries, deriving from improvements in competition and technology induced by FDI entry and enhanced domestic entrepreneurship. Eregba (2012) finds crowding-in effects for Economic Community of West African States (ECOWAS) countries over the period 1970-2008. Similarly, Merican (2009) found crowding out effects of FDI on domestic investment and growth in four ASEAN members, namely Thailand, Malaysia, Indonesia and the Philippines. Examining dynamic linkages, Ang (2009) points out that both FDI and public investment are complementary to domestic private investment in Malaysia.

Other cross sectional studies uncovered crowding out effects, mostly reflecting the countries' low level of development, institutional weaknesses and related market distortions. Fry (1993) found that FDI crowds out domestic investment because of domestic market distortions in developing countries. Morrissey et al. (2008) underline that the improvements in institutional quality may result in a crowding-in of domestic investment, because of improved business climate and more competitive foreign firms over less productive private firms. Finally, the impact of FDI on domestic investment in different countries appears strongly correlated with national FDI promotion policies, particularly filtering policies designed to minimize crowding out effects that displaces domestic firms or favour new technologies or products that generate crowding-in effects.

When it comes to SSA countries, Kottaridi and Stengos (2010) find that FDI inflows only enhance private investment beyond a threshold of absorptive capacity in terms of human capital. Some countries, under that threshold, because of a deficit in infrastructure, may show a lower absorptive capacity and the benefits of FDI may take some time to emerge. The insufficiency of FDI flows in key sectors of the economies and their concentration in extraction sectors may also play a role. Finally, the impact of FDI on private investment may be reduced and lagged when it focuses on sectors with weak interconnections with other economic activities.

Our paper improves the current literature on three grounds: (1) distinguishing private from public investment; (2) disentangling short-term from long-term effects; (3) taking the endogeneity of FDI flows into account.

First, most studies use total investment as their explained variable. However, the distinction between public and private investment matters. The impact of FDI may differ for private and public domestic investment Moallemi and Saglam (2011); Rath and Bal (2014), because interactions between private, public and international investors are multi-faceted. First, FDI may generate substantial fiscal revenue and improve domestic revenue mobilization either through taxation of the international sector (oil and mining, telecommunications) or revenue generated by infrastructure Le and Zak (2006). Second, the net impact of FDI on public investment depends upon cooperative or competitive choices by FDI investors and state-owned enterprises, with possible strong substitution effects with the private sector. Finally, fiscal policy may affect FDI substantially either through the fiscal costs of FDI promotion policies or business opportunities of large public projects launched by SSA governments. Infrastructure projects (transport, telecommunications, electricity, civil navigation etc) in particular tend to be intensive in imports and FDI flows. Then, FDI can also potentially create a crowding-in effect by facilitating public investment Ang (2009).

Second, to distinguish the various, and sometimes contradictory effects of FDI on domestic private investment, it may be necessary to disentangle short-term and long-term effects. This is premised on the fact that FDI cycles, especially for greenfield investments, may be implemented over several years and their effects on domestic investment, output and structure may occur, with time, in the long-run. Specific crowding-in or -out effects may affect both FDI and private investment in the short-run. The literature highlights the role of international or local business cycles, exchange rate instability, changes in investment policy and exchange rate variations and political instability in explaining investment Bosworth et al. (1999); Jude (2019). Thus, the possibility of opposite short and long-run effects of FDI on private investment cannot be excluded.

Third, we use Pooled Mean Group (PMG), Mean Group (MG) and Dynamic Full Effects (DFE), as opposed to Ordinary Least Squares (OLS), Fixed Effect (FE) and Random Effect (RE) to better address issues of variable stationarity and endogeneity, as well as temporal dynamics. In fact, our estimators are built from a dynamic error-correction model (ECM) applied to panel data which allows to use a lag structure to correct potential endogeneity. In addition, these estimators are consistent and present a superior performance compared to standard estimators applied to panel data, with a cointegrating relationship, as demonstrated by Pesaran et al. (1999).

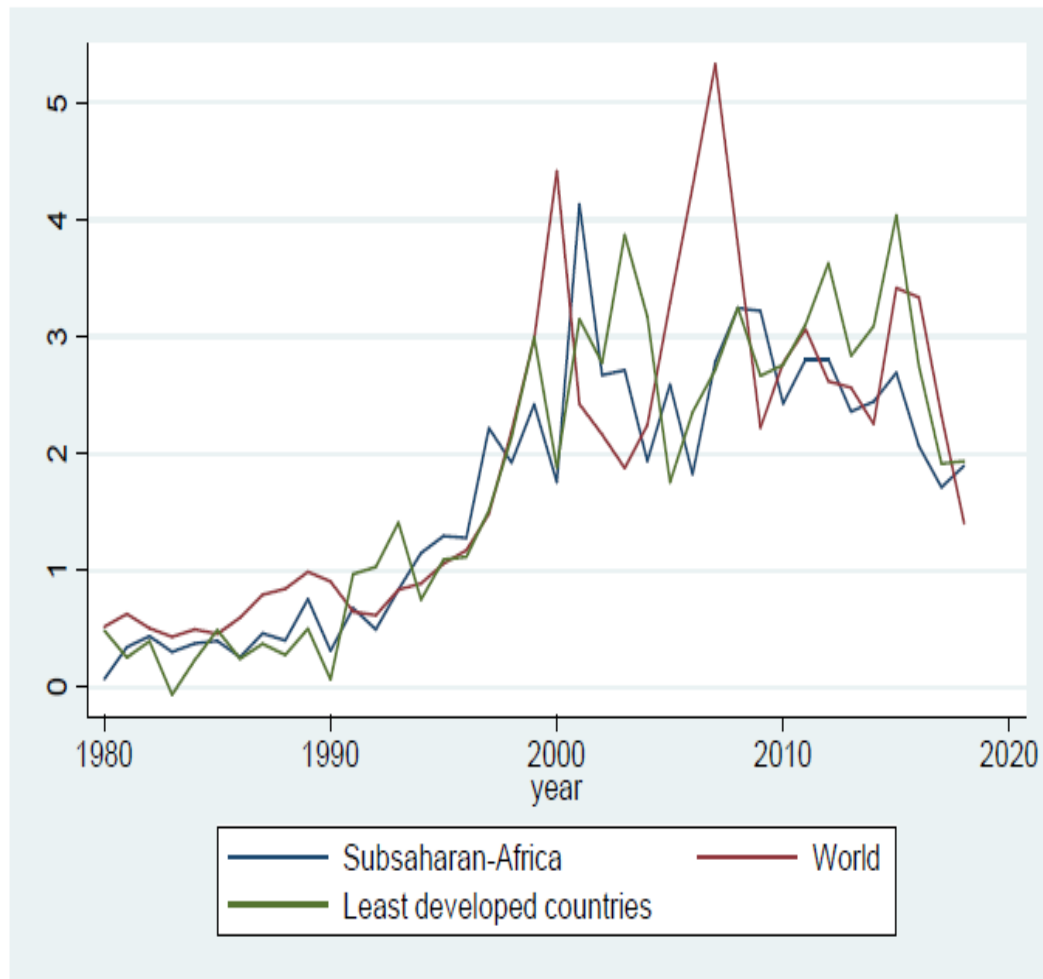
The remaining of the paper is organised as follows. In Section 2 we present recent trends of foreign direct investment in Sub-Saharan Africa. Section 3 present the data. Section 4 present our empirical methodology. Section 5 and 6 discuss the results. The last section proposes a conclusion and discussion.

2.2 Recent trends of foreign direct investment in Sub-Saharan Africa.

This section presents recent trends of foreign direct investment flows in Sub-Saharan African countries. As shown by figure 1, FDI flows to Sub-Saharan Africa have followed a rising trend over the last three decades. The rising attractiveness of SSA reflects the improvements in macroeconomic policy and stability, as well as more favorable business climates brought by structural reforms carried out since the 1990s by most SSA states, under the guidance of the World Bank and the IMF . These reforms include opening up to international trade, financial liberalization, privatization, simplification of FDI policies and institutional reforms. However, Sub-Saharan Africa's share in global FDI flows remains lower than other emerging and developing regions, partly due to a number of factors: structural barriers in African manufacturing, which have led to a decline in manufacturing flows, small, sluggish and highly fragmented markets, due to high domestic and international transport costs.

A detailed analysis (see figure 2), however, reveals that there are heterogeneities between the different sub-regions and that the trend in inflows differs from one sub-region to another. Central Africa and South Africa have been the least performing regions in terms of FDI attraction. FDI flows have been unstable and more volatile in these two regions. This poor performance can be explained in part by the socio-political instability and civil wars affecting some countries in this sub-region. On the contrary, the Eastern and Western African regions have been more successful in attracting FDI. the good performance in Western Africa may be explained by the economic, political and social reforms undertaken in this zone. There is also the fact that Western Africa mainly receives FDI in the mining and oil sectors, especially with Nigeria, a major oil producer, which attracts massive foreign investment. Concerning Eastern Africa, the performance in terms of attracting FDI can be explained by the fact that

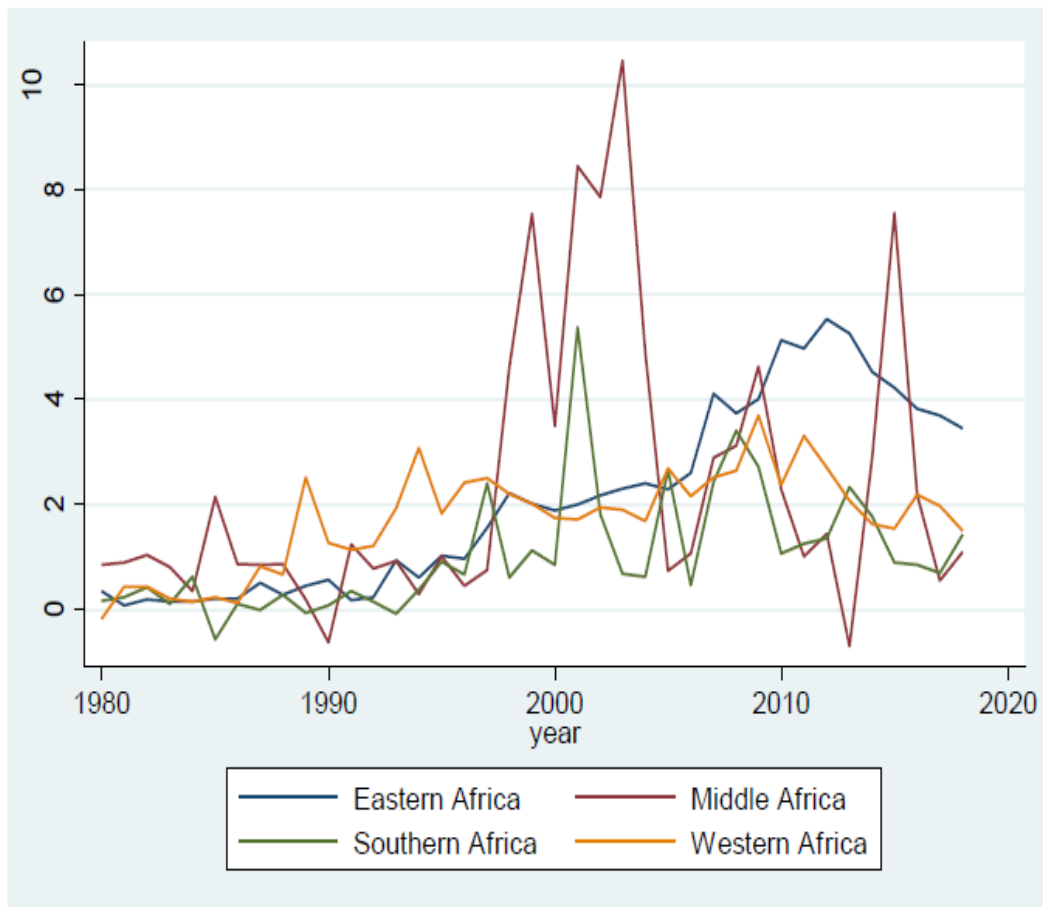
Figure 2.1 FDI inflows to Sub-Saharan African, World and Least developed countries(% of GDP) from 1980 to 2021



Source: World Bank data..

countries such as Ethiopia, Kenya, Tanzania and Uganda, which have natural resources and a significant market size, are present in this region.

Concerning the sectors favored by foreign direct investment, extractive industries such as mining and oil still occupy a substantial place, but increasingly services such as air transport, financial services in the majority and manufacturing are contributing to the attractiveness of FDI in Sub-Saharan Africa. New opportunities are also emerging in real estate and hotels, processing, agro-industry, wood and plastics, chemicals and electronics UNCTAD, World Investment report(2022). In terms of sources of inward FDI to Sub-Saharan Africa, the

Figure 2.2 Regional distribution of FDI (% of GDP) from 1980 to 2018.

Source: World Bank data..

countries of the Organization for Economic Cooperation and Development (United States, Germany, France, United Kingdom, Italy, Netherlands in particular) account for almost 40% of FDI . Emerging countries such as China, India and Brazil are also playing an increasingly important role in the region's FDI inflows. Chinese FDI in particular has increased since the mid-2000s. Chinese FDI has focused primarily on the extractive industries sector. The strategy of accessing raw materials is a substantial reason for Chinese FDI in Sub-Saharan Africa. Outside this sector, Chinese FDI is concentrated on three other activities: construction, manufacturing and finance.

2.3 Data

The data measuring investment flows as a percentage of GDP were collected from the *Investment capital stock* database of the International Monetary Fund (IMF). Other variables were extracted from the *World Development Indicators (WDI)* database of the World Bank and the United Nations Conference on Trade and Development (UNCTAD), *Policy IV* and *the Penn World Table*. We have constructed a panel for the 40 African countries covering the period 1980-2017, excluding countries with insufficient data (Democratic Republic of Congo, Djibouti, Eritrea, Gambia, Liberia, Seychelles, Somalia, Southern Sudan).

Insofar as FDI flows are financial investments, they differ from private domestic investment. As pointed out by Agosin and Machado (2005), FDI is a financial balance of payments concept while private domestic investment is a real national account aggregate variable. Domestic private investment measures the new capital added to the production capacity of a country. FDI measures investments of foreign firms in domestic productive capacity: existing capacity and newly installed capacity. FDI may not necessarily measure actual investment spending by foreign firms because there is no guarantee that these financial flows finance fixed investment, even if the FDI is greenfield. Of course, most financial transfers can be assumed to mostly reflect the acquisition of assets, but they may also finance current expenditure. In the literature some studies have analysed the effect of greenfield investment and mergers and acquisitions separately in order to avoid treating FDI as homogeneous Agosin and Machado (2005); Jude (2019). In our case we have analysed the composition of FDI towards SSA using the annual issues of the *World investment report* from 2003 until 2018. We find that FDI towards SSA is dominated by greenfield investment (more than 95% on average).

We have selected eight explanatory variables supported by strong theoretical foundations and empirical evidence. First, particular attention is paid to the impact of public investment

on private investment in our model specification. Public investment in infrastructure provision for transport, communication, energy, and human capital complements private investment. But it may also crowd it out if it competes with private sector investment, or if public spending is financed by a deficit, raising interest rates and the cost of capital for the private sector, as stressed by the Monetarist approach. The relation between these two variables is ambiguous.

We also consider macroeconomic stability approximated by inflation, public debt and real effective exchange rates. Inflation is generally perceived as a variable that increases the cost of capital, which in turn reduces its accumulation. However, other models such as Tobin-Mundell argue that higher expected inflation lowers the real interest rate, which can potentially increase real investment Ghura and Goodwin (2000).

The effect of real effective exchange rate on private investment may also be ambiguous. On the one hand, appreciation of the national currency reduces the competitiveness of firms and on the other hand, it signals the strength and the good health of an economy Ndikumana and Verick (2008). We expect public debt (as a percentage of GDP) to discourage private investment (eviction effects highlighted by the Monetarists).

Next, we add the level of financial development, measured by the ratio of domestic credit to the private sector on GDP, to measure the ease to borrow to finance new projects. More credit to the private sector and high access to financial services should encourage private investment ?. We then introduce total factor productivity (TFP) from the *Penn World Tables*. Since the countries of our sample are heavily labor abundant and their rate of innovation is low, TFP is mostly labor productivity. In the Schumpeterian view, productivity is a key factor of firm competitiveness, and thus for private investment. Innovation in processes, for example, provides productivity gains that will be reflected in prices. Thus, firms are likely to sell their products cheaper and gain market share, which in turn will increase their incentives to invest.

Institutional variables measuring political stability (*Policy IV index*) and the corruption perception index (as measured by *Transparency international*) test the effect of Keynes's

animal spirit of investors. Inso far as they trigger confidence and are associated with a favorable business climate, institutional quality and governance are essential to make African countries more attractive to foreign investors.

We also took into account the level of economic diversification, proxied by the export diversification index. As shown in the literature, the development of the manufacturing sector due to diversification may foster investment growth. Investment tends to be higher if the country has a diversified production. It refers to the diversification of assets in a portfolio choice approach. Because of the lack of detailed data on FDI and GDP broken down by major economic sector, we used the sectoral decomposition of GDP into agriculture, manufacturing and services from the WDI database to explore possible sectoral variations of the FDI impact on private investment. In order to measure such sectoral effects we interact FDI with sectoral value added (as a percentage of GDP).

Table 1 summarizes all the variables with their sources.

Table 2.1 Summary of variables

Variables	Sources	Expected sign
FDI inflows (FDI)	UNCTAD	+/-
Private investment (PRIVI)	IMF	
Public investment(PUBI)	IMF	+/-
Inflation (INF)	IMF	-
Exchange rate(EXRAT)	IMF	+/-
Political stability (POSTAB)	Policy IV	-
Productivity (PRDTY)	Penn World Table	+
Financial developement (FINDEV)	WDI World Bank	+
Debt (DEBT)	WDI World Bank	+/-
Export diversification	WDI World Bank	+
Manufacturing value added	WDI World Bank	+
Services value added	WDI World Bank	+
Agricultural value added	WDI World Bank	-
Corruption	Transparency international	-

Source: databases mentioned above and compilation by the authors.

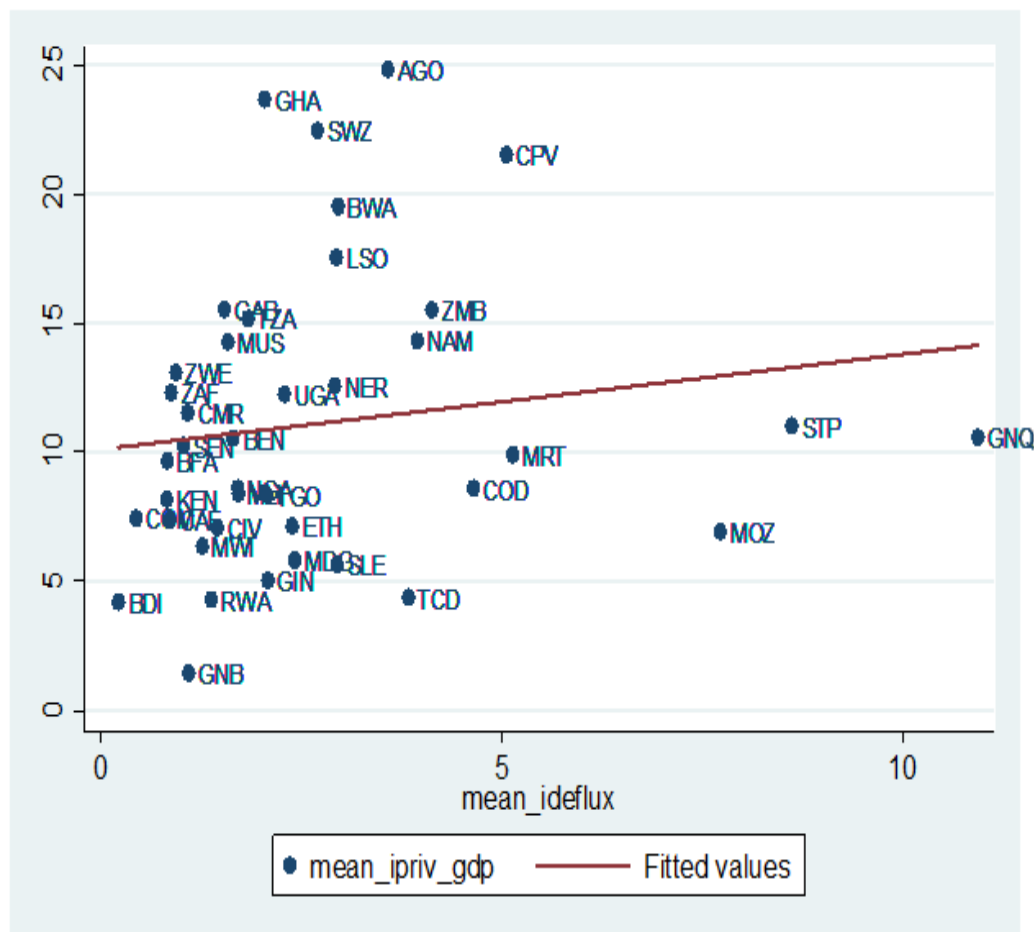
Table 2.2 Descriptive statistics.

Variables	N	mean	sd	min	max
FDI	1,464	2.659	5.282	-14.53	72.79
PRIVI	1,520	11.09	7.879	0.000837	60.68
PUBI	1,520	5.729	4.727	0.00144	36.34
INF	1,433	44.07	656.7	-72.73	23,773
EXRAT	1,482	131.2	108.6	28.50	1,954
FINDEV	1,346	15.82	15.24	0.403	151.0
POSTAB	1,316	0.689	1.612	0	10
PRDTY	1,326	0.259	0.302	0.0203	1.876
DEBT	1,393	49.72	40.46	0	300
EXPDIV	1,072	4.414	0.965	1.784	6.336
COR	1,182	35.47	16.73	10	82
MANVA	1,210	11.20	6.048	0.233	35.22
SERVA	1,257	44.94	10.14	18.91	77.02
AGRVA	1,362	24.02	14.07	1.294	71.76

Source: Authors' calculation from the databases.

Figure 3 plots the relation between the average ratio of private investment to GDP (horizontal axis) and the average ratio of FDI inflows to GDP (vertical axis), for all the countries, during the period under study. We observe a positive correlation between the ratio of private investment and the ratio of inward FDI. We can also clearly identify three outliers: Equatorial Guinea (GNQ), Sao Tome et Principe (STP) and the Mozambique (MOZ).

Figure 2.3 Outliers identification by means calculation.



Source: Sources: UNTCAD, IMF.

2.4 Empirical methodology

2.4.1 Econometric model

The study uses error-correction estimators on panel data developed by Pesaran et al. (2001, 1999); Pesaran and Smith (1995): the Pooled Mean Group (PMG), the Mean Group (MG) and the Dynamic Fixed Effects (DFE). These econometric methods fit with our purposes for two reasons. Firstly, like ARDL (Autoregressive Distributed Lags) which allows to estimate both short- and long-term coefficients, thanks to these methods, we can consider the long-run relationship separately from the short-run adjustment, even if the long and short-term effects are estimated jointly. As we aim to identify and distinguish the short from the long-term dynamics between private domestic investment and FDI, these methods are the most adapted. Other main advantages of these econometric methods is that, in opposite to Hansen and Phillips (1990) , and Johansen (1992) who argue that a long-term relationship can only occur between variables of the same order of integration, Pesaran et al. (1999) note that these estimators can be used even if the variables are of a different order of integration, i.e. $I(0)$, $I(1)$ or mixed.

In our model some variables such as FDI flows may suffer from the endogeneity problem due to double causality. Reverse causality may come from the fact that FDI may influence private domestic investment and/or the latter may also influence FDI Choe (2003); Kamaly (2002); Ndikumana and Verick (2008). Pesaran et al. (1999) noted that the PMG produces consistent estimates despite the possibility of endogeneity, as it includes lags of dependent and independent variables. They argue that, in the context of Autoregressive Distributed Lag Models (ARDL), the endogeneity problem can be easily handled by the PMG when the regressors are $I(1)$, subject to certain restrictions (such as a unique cointegrating relationship between the variables). In this case, Pesaran et al (1999) show that potential endogeneity can be handled by the lag structure by projecting the errors on the regressors.

We consider the following ARDL model $(p, q_1, q_2, \dots, q_k)$:

$$y_{it} = \sum_{j=1}^p \lambda_{ij} y_{i,t-j} + \sum_{j=0}^q \delta'_{ij} X_{i,t-j} + \mu_i + \xi_{it} \quad (2.1)$$

$$i = 1, 2, \dots, N; t = 1, 2, \dots, T$$

Where y_{it} denotes the format dependent variables (k x 1) and X_{it} a matrix of explanatory variables, μ_i represents the individual fixed effects, λ_{ij} are coefficients assigned to the delayed dependent variables $(y_{i,t-j})$, δ'_{it} are coefficient vectors (k x 1). If the variables in equation (1) are cointegrated, then the equation can be reformulated to obtain a panel error-correction model in which the short-term and long-term dynamics between these variables are clear, as shown in the following equation:

$$\Delta y_{it} = (\phi_i y_{i,t-1} + \beta'_i X_{it}) + \sum_{j=1}^{p-1} \lambda^*_{ij} y_{i,t-j} + \sum_{j=0}^{q-1} \delta^{*'}_{ij} X_{i,t-j} + \mu_i + \xi_{it} \quad (2.2)$$

where $\Delta y_{it} = y_{it} - y_{i,t-1}$, $\phi_i = -(1 - \sum_{j=1}^p \lambda_{ij})$, $\beta_i = \sum_{j=0}^q \delta_{ij}$, $\lambda^*_{ij} = -\sum_{m=j+1}^p \lambda_{im}$, $\delta^*_{ij} = -\sum_{m=j+1}^q \delta_{im}$

By stacking all the observations for each individual in the panel, equation (2) can be reparameterized and expressed as follows:

$$\Delta y_i = \phi_i y_{i,t-1} + X_i \beta_i + \sum_{j=1}^{p-1} \lambda^*_{ij} \Delta y_{i,-j} + \sum_{j=0}^{q-1} \Delta X_{i,-j} \delta^*_{ij} + \mu_i \tau + \xi_{it} \quad (2.3)$$

Where $y_i = (y_{i1}, y_{i2}, y_{i3})'$ is a matrix of format (Tx1), $X_i = (X_{i1}, X_{i2}, X_{i3})'$ a matrix of format (Txk) and $\tau = (1, 1, \dots, 1)'$ a matrix of format (Tx1).

The parameter ϕ_i is the error correction speed of the adjustment term. If $\phi_i = 0$, so there is no evidence of a long-term relationship between the dependent variable and the independent variables. Pesaran et al (1995) assume that equation (3) is stable. This hypothesis ensures that $\phi_i < 0$, i.e. that the roots of the operator polynomial $1 - \sum_{j=1}^p \lambda_{ij} z^j = 0$ lie outside the unit circle reflecting the existence of a long term relationship between y_{it} and X_{it} defined by:

$$y_{it} = -(\beta'_i/\phi_i)X_{it} + \eta_{it} \quad (2.4)$$

with η_{it} a stationary process. The long-term coefficient is given by $\theta_i = \beta_i/\phi_i$.

Our empirical equation is as follows:

$$\begin{aligned} \Delta PRIVI_{it} = & \mu_i + \varphi_t + \phi_i PRIVI_{i,t-1} + \beta_1 FDI_{it} + \beta_3 PUBI_{it} + \beta_4 INF_{it} + \beta_5 FINDEV_{it} \\ & + \beta_6 EXRAT_{it} + \beta_7 DEBT_{it} + \beta_8 EXPDIV_{it} + \beta_9 PRDTY_{it} + \beta_{10} POSTAB_{it} + \\ & \beta_{11} COR_{it} \\ & + \sum_{j=0}^{q-1} \delta_{ij}^* \Delta X_{i,t-j} + \xi_{it} \end{aligned} \quad (2.5)$$

The short term dynamics is given by:

$$\begin{aligned} \sum_{j=0}^{q-1} \delta_{ij}^* \Delta X_{i,t-j} = & \delta_1 \Delta FDI_{it} + \delta_2 \Delta PUBI_{it} + \delta_3 \Delta INF_{it} + \delta_4 \Delta FINDEV_{it} + \delta_5 \Delta EXRAT_{it} \\ & + \delta_6 \Delta DEBT_{it} + \delta_7 \Delta EXPDIV_{it} + \delta_8 \Delta PRDTY_{it} + \delta_9 \Delta POSTAB_{it} + \\ & \delta_{10} \Delta COR_{it} \end{aligned} \quad (2.6)$$

with y_{it} , our dependent variable $PRIVI_{it}$ private investment.

Variables description:

- FDI_{it} inflows of foreign direct investment towards a country i in year t in percentage of GDP,
- $PUBI_{it}$ flows of public investment inside country i for year t in percentage of GDP,

- INF_{it} inflation in country i for year t ,
- $FINDEV_{it}$ financial development, measured by bank credit accommodated in country i during year t ,
- $EXRAT_{it}$ real effective exchange rate of country i in year t ,
- $DEBT_{it}$ public debt of country i in year t ,
- $PRDTY_{it}$ total factor productivity (proxy of labor productivity) of country i in year t ,
- $EXPDIV_{it}$ export diversification of country i for year t ,
- $POSTB_{it}$ political stability in country i for year t , and
- COR_{it} corruption in country i for year t .

2.4.2 Panel stationarity tests

Given that our study uses macroeconomic variables that are collected for several African countries (40) over a significant number of years (38 years), We implement unit root tests of Im, Pesaran and Shin -IPS- and Maddala and Wu -MW.

The IPS test uses a modification of the Dickey-Fuller regression (ADF). It is based on the following regression:

$$\Delta y_{it}^* = \rho_i y_{t-1}^* + \sum_{j=1}^k \phi_{i,j} \Delta y_{i,t-1}^* + \zeta_{i,t}^*, i = 1, 2, \dots, N; t = 1, 2, \dots, T \quad (2.7)$$

where $y_{it}^* = y_{it} - \bar{y}_i$. Under the null hypothesis, the time series are non-stationary, whereas the alternative assumes the opposite. The assumptions can be written as follows:

H_0 : $\rho_i = 0$ for all i

H_1 : $\rho_i < 1$ for at least one i , $i = 1, 2, \dots, N_1$; $\rho_i = 0$; $i = N_1 + 1, N_1 + 2, \dots, N$.

2.4.3 Panel cointegration tests

The conditions for using PMG, MG and DFE estimators is that variables need to be cointegrated. The cointegration analysis allows us to identify one or more long term relationships between at least two variables. The concept of cointegration stipulates that at least two variables are involved in a long term equilibrium relationship and that any imbalance in this relationship generates a correction mechanism by which one or more variables adjust to restore the long term equilibrium. We use Kao's test based on the following long-run relationship :

$$y_{i,t} = \theta_i + \alpha_i^1 x_{i,t}^1 + \dots + \alpha_i^m x_{i,t}^m + \dots + \alpha_i^M x_{i,t}^M + \zeta_{i,t}. \quad (2.8)$$

$i=1,\dots,N$; $t=1,\dots,T$; $m=1,\dots,M$. $E(\zeta_{i,t}, \zeta'_{j,t}) = \sigma_\zeta^2$ if $i=j$ and 0 if $i \neq j$.

The estimated residuals are represented as follows:

$$\zeta_{i,t} = \rho_i \zeta_{i,t-1} + \mu_{i,t} \quad (2.9)$$

The null hypothesis that there is no co-integration between the variables is given by: $H_0: \rho_i = \rho = 1$.

2.5 Empirical results

2.5.1 Stationarity and cointegration test results

Tables 2 and 3 provide results of IPS (1997), Maddala and Wu (1999) unit root test for variables stationarity. Table 5 provides results of Kao's cointegration test. IPS test shows that the variables private investment (PRIVI), FDI flows (FDI), public investment (PUBI), inflation

(INF), exchange rates (EXRAT), financial development (FINDEV), export diversification (EXPDIV), Corruption (COR), manufacturing value added (MANVA), service value added (SERVA), agricultural value added (AGRVA) are stationary in level. Variables political stability (POSTAB), productivity (PRDTY), debt (DEBT) are stationary in first difference. Stationarity of our variables prevents us from having biased results due to spurious regression. We also used the Maddala and Wu stationarity test which confirmed the results we obtained with the IPS test (see table 3).

Output of Kao cointegration reports values of all test statistics with their respective p-values. All test statistics reject the null hypothesis of no cointegration in favour of the alternative hypothesis of the existence of a cointegrating relation among the variables. A cointegration of variables allows us to identify the long-term dynamics that we are seeking to highlight in this study.

Table 2.3 Panel unit root test: IPS (1997)

Variables	Level		First difference	
	No trend	trend	No trend	trend
PRIVI	-2.1439	-2.7841	-	-
FDI	-3.3321	-4.0070	-	-
PUBI	-2.2584	-2.7325	-	-
INF	-4.6842	-4.2568	-	-
FINDEV	-3.5127	-3.2452	-	-
EXRAT	-2.3019	-2.4588	-	-
DEBT	-1.3483	-1.1975	-5.7545	-4.0691
PRDTY	-1.3649	-2.1076	-6.5420	-6.8851
POSTAB	-1.6792	-3.6628	-7.4829	-7.4427
EXPDIV	-2.1955	-3.0588	-	-
COR	-2.1565	-2.6917	-	-
MANUVA	-2.4842	-2.5447	-	-
SERVA	-2.1955	-2.5082	-	-
AGRVA	-2.2969	-4.9081	-	-

Source: Authors' calculation from the databases.

These value are compared to the following critical value: no trend a 1% (-1.81), 5% (-1.73), 10% (-1.68). With trend at 1% (-2.44), 5% (-2.36), 10% (-2.32). These critical values are available in IPS 1997

Table 2.4 Maddala and WU (1999) unit root test

Variables	Level		First difference	
	ADF-Pm	PP-Pm	ADF-Pm	ADF-Pm
PRIVI	20.5279***	7.3203***	-	-
FDI	38.6229***	26.6123***	-	-
PUBI	21.0083***	6.1456***	-	-
INF	60.2686***	52.9623***	-	-
FINDEV	11.7636***	11.1337***	-	-
EXRAT	21.1781***	8.0024 ***	-	-
DEBT	8.9583***	-0.2798	68.7178***	65.6386 ***
PRDTY	10.8577***	-0.0464	91.2051***	110.8250***
POSTAB	13.1527***	0.6875	106.5921***	143.7170***
EXPDIV	19.1651***	6.9225***	-	-
COR	5.4532***	6.9225***	-	-
MANVA	15.5890***	6.3799***	-	-
SERVA	19.1651***	6.9831 ***	-	-
AGRVA	21.2620***	8.1349 ***	-	-

Source: Authors' calculation from the databases.

Significant at: *** 1% ,** 5% , * 10%

The results from Maddala and Wu test confirm that private investment (PRIVI), FDI flows (FDI), public investment (PUBI), inflation (INF), exchange rates (EXRAT), financial development (FINDEV), export diversification (EXPDIV), corruption (COR), manufacturing value added (MANVA), service value added (SERVA), agricultural value added (AGRVA) are stationary in level. Political stability (POSTAB), productivity (PRDTY), debt (DEBT) are stationary in first difference.

Table 2.5 Panel cointegration test: Kao test

	Statistics	P-value
Modified Dickey-Fuller t	-6.2628	0.0000
Dickey-Fuller t	-6.2835	0.0001
Augmented Dickey-Fuller t	-3.7188	0.0001
Unadjusted modified Dickey-Fuller t	-8.0821	0.0000
Unadjusted Dickey-Fuller t	-6.8743	0.0000

Source: Authors' calculation from the databases.

2.5.2 Results analysis

Diverging impact in the short term and the long term

Table 6 in Annex 1 contains the results of PMG, MG and DFE estimates and Hausman's test to measure comparative effectiveness and consistency between them. The Hausman's test indicates that the PMG estimation is the most efficient estimator and we will use and discuss this estimation technique in the rest of the paper. MG and DFE estimations were also carried out. Our findings underline clear differences between short-term and long-term effects. We find that short-term dynamics are complex: the impact of FDI on private investment is either negative, or non significant. Long-term dynamics are much clearer, with consistently significant positive effects on private investment.

Our baseline results in table 6 in Annex 1 (column 1) confirm that macroeconomic stability and the quality of the institutional framework are important determinants of private investment in developing countries. In the short term, a high rate of inflation and an appreciation of the currency have a positive effect on domestic investment, mainly reflecting cyclical effects and for the latter the strength or catching up of the economy. Financial development and productivity have a positive effect on domestic investment, as well as export diversification, while high public debt and corruption discourage it.

In the long term, inflation deters private investment, as well as the accumulation of public debt, in line with theory. This stems from the crowding-out effect of public investment, since public investment in developing countries is for a large part financed by public debt, given limited fiscal resources mobilization. In fact, an excessive accumulation of fiscal deficits can have a negative impact on private investment by pushing interest up. We still observe the positive effect of financial development, productivity and export diversification. Corruption also deters private investment by increasing the cost of economic operations and by creating economic distortions. Financial development is associated with higher private domestic

investment. As expected, productivity has strongly positive effect on private investment as it plays an important role in the investment decisions of entrepreneurs, especially in developing economies with more labor-intensive and less capital-and in FDI innovation-intensive sectors than advanced economies.

When it comes to the impact of foreign direct investment, our results indicate that it has a significant crowding-in effect on domestic investment in the long term and a weakly crowding out effect in the short term. Our results are consistent with the findings of Agosin and Mayer (2000) for Asian countries in particular, with the only difference that we use private domestic investment rather than total domestic investment. These results are also consistent with the findings of De Mello (1999) and Borensztein et al. (1998) for groups of developing countries in Latin America and Asia.

In the short term however, the ability of the private sector to adapt to FDI inflows may be slowed down by low human capital accumulation, market distortions, infrastructure bottlenecks and less favourable business climates found in SSA economies. These weaknesses may limit the capacity of local firms to adapt and face competition from incoming foreign investment in the short run, inducing temporary negative effects on private investment. These temporary effects may depend on critical abilities:

1. Innovation capacity to create and rapidly adopt new technologies introduced by foreign direct investment in certain sectors,
2. capacity to promote efficient and flexible allocation of resources between sectors and firms,
3. human capital endowment and training to rapidly disseminate new technologies throughout the economy and develop the capacity of the workforce to assimilate them.

This long-term crowding-in effects of FDI on private investment are in line with empirical findings for developing countries such as Kottaridi and Stengos (2010).

FDI public investments composition effects.

In the baseline, we find that public investment has opposite effects on domestic private investment in the short and long-run. In the short run, public investment may create business opportunities for the private sector in times of economic growth. It affects private investment negatively in the long run, insofar as it is associated with higher fiscal deficits and higher public debt. These imbalances may exert an upward pressure on interest rates, increase expectations of future tax increases and risks associated with state insolvency and financial instability. In countries with strong interactions between the public and the banking sectors (sovereign-bank nexus), as well as significant information asymmetries between borrowers and creditors, high fiscal deficits and levels of public debt may also limit available financing for the private sector.

We then interacted public investment with FDI to identify the role of the capital inflows linked to investments in the public sector and their impacts on domestic private investment (our sample covers a period of development of public-private partnerships, see column 2 of table 7 in Annex 1). Interestingly, we find a crowding-in effect in the long run, reflecting a positive impact of these composition effects on domestic private investment. Several studies based on geographical economics and endogenous growth theory also show that the combination between the stock of public infrastructure and FDI can potentially create agglomeration effects and inter-firm externalities that stimulate domestic investment Barro (1990); Kinda (2007). A large number of countries in SSA welcome foreign participation in their public investments, particularly in the financing and provision of infrastructure services UNCTAD (2021). Increasing pressures on public budgets and general concern about the quality of services provided by operating entities have led to an explosion of FDI in infrastructure in these countries. These FDI inflows target sectors which were traditionally devoted to the public sector and large state-owned enterprises to provide infrastructure such

as seaports and airports, telecommunications, electricity, railways, roads, urban infrastructure, industrial parks, mining, etc.

We also explored the relationship between national economic structure and private investment and possible FDI impacts. Because of lack of available sectoral FDI decomposition data, we use export diversification and sectoral breakdown of GDP between agriculture, manufacturing and services. These breakdowns give us a proxy of the economic diversification among activities (as we cannot split FDI into the three main sectors of activity). As posited in the literature, our estimations in column (1) table 7 Annex 1 provide some evidence that private investment is boosted by exports diversification. More decisively, the positive impact of FDI on private investment is significantly enhanced by export diversification, confirming the importance of FDI diversification itself to reap cross-sectoral benefits.

In column (4) table 7 Annex 1, interacting FDI with sectoral decompositions provides more detailed evidence of the effects of economic diversification: the impact of FDI is magnified when the share of the secondary sector (industry) and tertiary sectors (services) increase in GDP. Given data limitation on sectoral FDI, we cannot conclude on the impact of FDI diversification itself, but these results are consistent with literature streams linking economic diversification, investment and economic growth. Symmetrically, FDI in less diversified countries (dependent on commodity output and exports in resource rich countries), may provide less private investment and economic diversification opportunities.

2.6 Robustness checks

We examine the extent to which our baseline results vary according to the level of natural resource exports by re-estimating the model for natural resource-exporting and non-natural resource-exporting countries. Securing the supply of raw materials and other natural resources appears as an important objective of FDI from multinational firms. For these types of

resource-seeking or rent-seeking FDI, a weaker correlation with domestic investment is to be expected than in other countries. Moreover, the literature on the Dutch disease and the resource "curse" for instance show that the abundance of natural resources limits the ability of FDI to stimulate domestic investment. To capture this type of economic structure, we compare natural-resource exporting countries with non-natural-resource exporting countries.

Crowding-in effects of FDI are significantly higher in non-natural resource-exporting countries than in resource-exporting countries, as shown from the comparisons of columns (2) and (3) in table 8 Annex 1. This result reflects the fact that the level of diversification of economies conditions the magnitude of the impact of FDI on domestic private investment in SSA countries. As natural resource-exporting countries are relatively more concentrated and less diversified than non resource-exporting countries in SSA UNCTAD (2021), FDI in these countries tends to be concentrated in resource-exporting sectors and spread very little across the economy and therefore has a low probability of having a strong impact on domestic private investment. In countries that do not export natural resources, FDI tends to be spread over several sectors and therefore have a high probability of impacting the activity of local firms.

As some countries are outliers (Cabo Verde, Equatorial Guinea, Eswatini and Sao Tome and Principe, see figure 3), we have excluded them to test the sensitivity of our results. In table 8 Annex 1 , Column 4 contains the results obtained for the baseline sample without these countries. Our results are robust to this specification.

In table 9 Annex 1 , we test the robustness of our results in different sub-periods of time. Since 2008 global economic crisis induced major shocks to economies. We investigate whether the crisis has impacted the relationship between FDI and domestic private investment. In 2008, international investment experimented a sharp slowdown. More precisely, the decline in global FDI may result from two major factors affecting domestic and international private investment:

1. the reduced ability of multinational firms to invest because of constraints on access to financial resources;
2. a decreasing propensity to invest in developed countries, source economies of FDI inflows towards developing countries.

To test this, we consider the pre-crisis period 1980-2007(column 2) and the post-crisis period 2008-2017 (column 3) separately. Our results are robust to this specification.

2.7 Conclusion and policy recommendation

This paper investigates whether the FDI inflows to SSA countries lead to crowding-in or crowding-out effects on private domestic investment, based on PMG, MG and DFE estimations on a panel of 40 countries over the period 1980-2017. Our results bring to light that FDI inflows have substantial crowding-in effects in the long run. In the short-run, we find weak evidence that FDI inflows have crowding-out effects but in the long term the positive effects prevail. The positive benefits of FDI on private investment may take time to materialize because of implementation lags, weak domestic capacity to respond to competition, low absorption capacity.

Our study also strives to disentangle effects of FDI on private and public domestic investment. Our estimations show that FDI combined with higher public investment may enhance private domestic investment in the long run. Such positive composition effects may however be undermined by crowding-out effects from higher fiscal deficits and debt, as well as by political instability and corruption. We also find weak evidence that FDI inflows may exacerbate crowding out effects of private investment of real effective exchange rate appreciation.

Finally, this research highlights the importance of economic diversification and resource endowments to assess the impact of FDI on private investment. Using an export diversification

index, we find evidence that such diversification has a positive effect on private investment, particularly if it is associated with FDI inflows. When interacting FDI with the share of manufacturing and services, we also find that the FDI inflows have greater impact on secondary and tertiary sectors that contribute to economic diversification. To establish robustness of our findings, we checked that the positive impact of FDI on private investment is significantly higher in non-resource exporting diversified countries than in resource exporting countries. This is in line with literature concerns on the impact of FDI in enclaved sectors, such as the extractive sector (oil curse), on economic development.

These findings lead us to qualify the conditions of success for investment promotion policies commonly led in SSA countries. First, such policies are more likely to be efficient if they are conducted consistently over the long run with a view to favor economic diversification. Such policies need to maximize spillover effects and intra- and inter-sector connections between FDI and domestic private investment over the long run. This is particularly important in the case of highly concentrated resource-exporting sectors where FDI crowding-in effects on private investment are more limited. National FDI strategies should therefore be based on specific country characteristics (natural resources, labor and capital endowments, and type of FDI).

Second, reallocating public spending in favor of high-yield public investment (e.g. reducing infrastructure bottlenecks or increasing human capital) and leveraging scarce public resources partnerships with the private and international investors are also key. Such promotion policies should also be enabled by structural reforms aiming at improving the business climate for both foreign and domestic investors. Our results also show that financial depth, and in particular access to credit by small and medium enterprises are essential to support domestic investment. The financial sector may play an essential role in channeling international financing and direct investment to support domestic investment and economic growth.

Further research is clearly needed on the dynamics between FDI, public and private investment. It may be increasingly necessary to address the impact of changing geographical origins of SSA FDI and private investment, with the rise of China and emerging countries and the relative decline of advanced economies with large remaining stocks of FDI. This globalization process itself may be challenged by digitalization and economic crises (the Covid 19 could result in a 25-40% decline in FDI to SSA in 2020) and to trade relocation or regionalization, with possible structural breaks in associated FDI and private investment patterns far more significant than that of the 2008 crisis covered by our study.

2.8 Annex 1.

Table 2.6 Comparison of estimations with the three estimators PMG, MG and DFE.

Variables	PMG	MG	DFE
Long term coefficients			
FDI inflows	0.298*** (0.0505)	0.313*** (0.0695)	0.381*** (0.0886)
Public investment	-0.093** (0.0383)	-0.110* (0.0594)	-0.089* (0.0467)
Financial development	0.303** (0.1183)	0.326*** (0.0931)	0.256*** (0.0673)
Inflation	-0.086* (0.0453)	-0.079 (0.0652)	-0.068 (0.0739)
productivity	0.462*** (0.0855)	0.343*** (0.0902)	0.456*** (0.1223)
Debt	-0.091* (0.0481)	-0.112 (0.0803)	-0.083 (0.1063)
Political stability	-0.260*** (0.0604)	-0.236*** (0.0524)	-0.197*** (0.0428)
Exchange rate	-0.079* (0.0441)	-0.083 (0.1092)	-0.070 (0.0786)
Corruption	-0.081* (0.0435)	-0.103 (0.1144)	0.068 (0.0552)
Exports diversification	0.063* (0.0335)	0.079 (0.0607)	0.046 (0.0380)
Error correction term	-0.265*** (0.0562)	-0.253*** (0.0668)	-0.189*** (0.0461)
Short term coefficients			
ΔFDI inflows	-0.093* (0.0510)	-0.079 (0.0823)	-0.086 (0.0781)
ΔPublic investment	0.212** (0.0854)	0.183** (0.0658)	0.126** (0.0435)
ΔFinancial development	0.242** (0.0975)	0.283* (0.1530)	0.223*** (0.0464)
ΔInflation	0.080* (0.0437)	0.095* (0.0530)	-0.079* (0.0427)
Δ Productivity	0.289*** (0.0783)	0.203*** (0.0550)	0.315*** (0.0809)
Δ Debt	0.072* (0.0411)	-0.063 (0.0656)	-0.046 (0.053)
Δ Political stability	-0.227*** (0.0527)	-0.198*** (0.0512)	-0.209*** (0.0564)
ΔExchange rate	0.062* (0.032)	0.116* (0.0613)	0.041 (0.0493)
Δ Corruption	-0.085 (0.1089)	-0.071 (0.0578)	-0.039 (0.0423)
Δ Exports diversification	0.059 (0.0491)	0.089* (0.0481)	0.050 (0.0556)
Constant	2.589*** (0.4598)	2.739*** (0.4891)	2.635*** (0.4879)
Observations	1520	1520	1520
Hausman test	0.156	0.156	0.271
Number of contry	40	40	40

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

Table 2.7 Estimation with PMG (Baseline results).

Variables	(1)	(2)	(3)	(4)
Long term coefficients				
FDI inflows	0.298*** (0.0505)	0.304*** (0.0516)	0.309*** (0.0521)	0.302*** (0.0534)
Public investment	-0.093** (0.0383)	-0.103** (0.0430)	-0.098** (0.0395)	-0.108** (0.0441)
Financial development	0.303** (0.1183)	0.316** (0.1220)	0.308** (0.1162)	0.312** (0.1122)
Inflation	-0.086* (0.0453)	-0.091* (0.0523)	-0.103* (0.0544)	-0.099* (0.0535)
productivity	0.462*** (0.0855)	0.453*** (0.0808)	0.426*** (0.0946)	0.501*** (0.1287)
Debt	-0.091* (0.0481)	-0.082* (0.0440)	-0.107* (0.0578)	-0.118* (0.0662)
Political stability	-0.260*** (0.0604)	-0.273*** (0.0781)	-0.251*** (0.0657)	-0.289** (0.0642)
Exchange rate	-0.079* (0.0441)	-0.094* (0.0525)	-0.088* (0.0494)	-0.059 (0.0598)
Corruption	-0.081* (0.0435)	-0.078* (0.0410)	-0.101* (0.0528)	-0.092 (0.0768)
Exports diversification	0.063* (0.0335)	0.057* (0.0308)	0.073* (0.0417)	0.081 (0.0543)
FDI*public invest		0.227*** (0.0598)	0.238*** (0.0553)	0.263*** (0.0571)
FDI*exports divers		0.353*** (0.0907)	0.371*** (0.1042)	0.388*** (0.0917)
FDI*exchange rate			-0.078* (0.0433)	-0.069* (0.0399)
Manufacturing VA*FDI				0.109*** (0.0343)
Service VA*FDI				0.178*** (0.0450)
Agriculture VA*FDI				0.056* (0.0312)
Error correction term	-0.265*** (0.0562)	-0.229*** (0.0509)	-0.253*** (0.0527)	-0.218*** (0.0473)
Short term coefficients				
Δ FDI inflows	-0.093* (0.0510)	-0.089* (0.0503)	-0.106* (0.0572)	-0.099* (0.0540)
Δ Public investment	0.212** (0.0854)	0.224** (0.0909)	0.217** (0.0789)	0.209** (0.0765)
Δ Financial development	0.242** (0.0975)	0.218** (0.0784)	0.237** (0.0967)	0.225** (0.0816)
Δ Inflation	0.080* (0.0437)	0.091* (0.0481)	0.086* (0.0472)	0.095* (0.0502)
Δ Productivity	0.289*** (0.0783)	0.315*** (0.0875)	0.326*** (0.0724)	0.325*** (0.0789)
Δ Debt	0.072* (0.0411)	0.049 (0.0408)	0.058 (0.0471)	0.083 (0.0691)
Δ Political stability	-0.227*** (0.0527)	-0.232*** (0.0515)	-0.243*** (0.0574)	-0.213*** (0.0507)
Δ Exchange rate	0.062* (0.0321)	0.067 (0.0471)	0.039 (0.0453)	0.056 (0.0583)
Δ Exports diversification	-0.085 (0.1089)	-0.052 (0.0956)	-0.035 (0.0783)	-0.047 (0.0546)
Δ Corruption	0.059 (0.0491)	0.082* (0.0458)	0.071* (0.0398)	0.037 (0.0474)
Δ FDI*public invest		0.284*** (0.0671)	0.276*** (0.0652)	0.283*** (0.0627)
Δ FDI*exports divers		0.293*** (0.0759)	0.283*** (0.0712)	0.275*** (0.0719)
Δ FDI*exchange rate			-0.053* (0.0306)	-0.072* (0.0412)
Δ Manufacturing VA*FDI				0.068* (0.0369)
Δ Service VA*FDI				0.087* (0.0465)
Δ Agriculture VA*FDI				0.035 (0.0392)
Constant	2.589*** (0.4598)	2.785*** (0.5157)	2.896*** (0.6213)	2.562*** (0.5338)
Observations	1520	1520	1520	1520
Number of contry	40	40	40	40

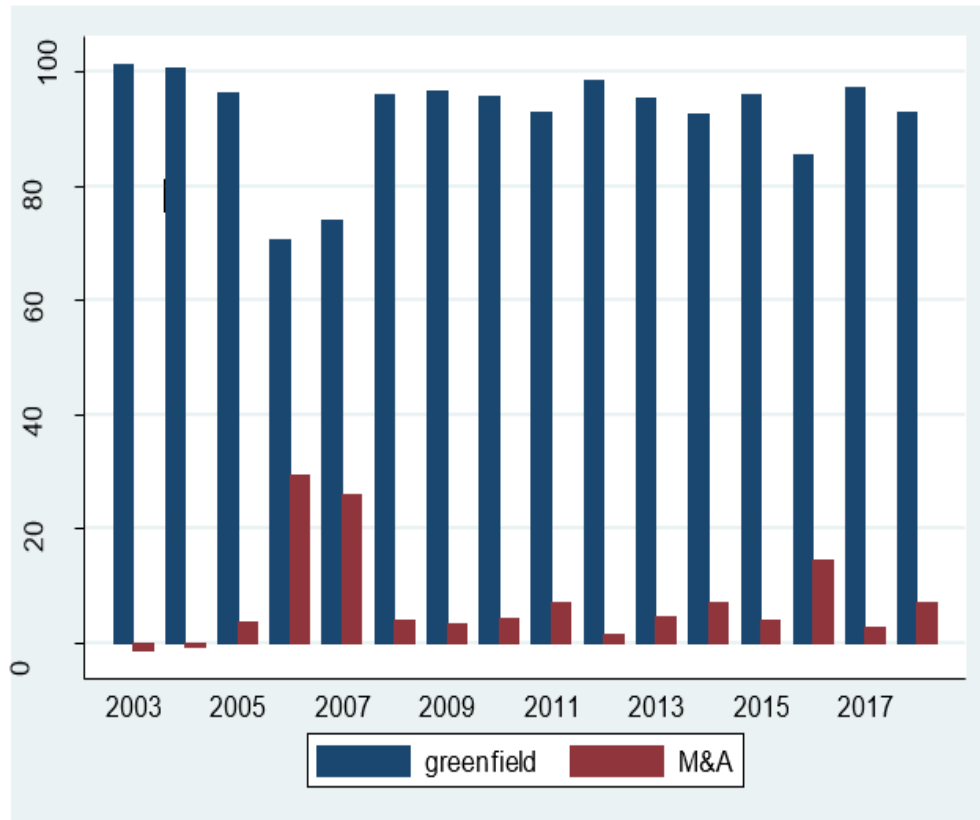
Table 2.8 Results for natural and non natural ressources exporting countries and without outliers.

Variables	(1)	(2)	(3)	(4)
Long term coefficients				
FDI inflows	0.309*** (0.0521)	0.418*** (0.0972)	0.904*** (0.1910)	0.315*** (0.0810)
Public investment	-0.098** (0.0395)	-0.104** (0.0326)	-0.079* (0.0443)	-0.110** (0.0381)
Financial development	0.308** (0.1162)	0.216*** (0.0675)	0.189*** (0.0542)	0.324** (0.1255)
Inflation	-0.103* (0.0544)	-0.245* (0.1376)	-0.078 (0.0652)	-0.081* (0.0433)
productivity	0.426*** (0.0946)	0.413*** (0.0915)	0.486*** (0.1249)	0.453*** (0.1065)
Debt	-0.107* (0.0578)	-0.179** (0.0675)	-0.061 (0.0508)	-0.152** (0.0617)
Political stability	-0.251*** (0.0657)	-0.189*** (0.0481)	-0.287*** (0.0717)	-0.249*** (0.0682)
Exchange rate	-0.088* (0.0494)	-0.072* (0.0389)	-0.081 (0.0983)	-0.073* (0.0386)
Corruption	-0.101* (0.0528)	-0.084 (0.0636)	-0.057 (0.0721)	-0.093* (0.0522)
Exports diversivication	0.073* (0.0417)	0.116* (0.0644)	0.206* (0.1113)	0.061* (0.0321)
FDI*publique invest	0.238*** (0.0553)	0.304*** (0.0718)	0.164*** (0.0431)	0.208*** (0.0569)
FDI*exports divers	0.371*** (0.1042)	0.352*** (0.0904)	0.978*** (0.2309)	0.337*** (0.0965)
FDI*exchange	-0.078* (0.0433)	-0.053 (0.05955)	-0.042 (0.0308)	-0.082* (0.0448)
Error correction term	-0.253*** (0.0527)	-0.282*** (0.0587)	-0.387*** (0.0782)	-0.268*** (0.0582)
Short term coefficients				
△ FDI inflows	-0.106* (0.0572)	-0.045* (0.0248)	-0.083* (0.0448)	-0.110* (0.0582)
△ Public investment	0.217** (0.0789)	0.159** (0.0593)	0.119** (0.0479)	0.225** (0.0814)
△ Financial development	0.237** (0.0967)	0.256*** (0.0691)	0.275*** (0.0723)	0.242** (0.0902)
△ Inflation	0.086* (0.0472)	0.068 (0.0567)	0.048* (0.0265)	0.090* (0.0513)
△ Productivity	0.326*** (0.0724)	0.289*** (0.0746)	0.252*** (0.0673)	0.342*** (0.0803)
△ Debt	0.058 (0.0471)	0.049 (0.0547)	0.064* (0.0365)	0.063 (0.0484)
△ Political stability	-0.243*** (0.0574)	-0.176*** (0.0517)	-0.209*** (0.0558)	-0.235*** (0.0663)
△ Exchange rate	0.039 (0.0453)	0.079* (0.0431)	0.087 (0.0967)	0.045 (0.0505)
△ Corruption	-0.035 (0.0783)	-0.069* (0.0372)	-0.091 (0.0758)	-0.050 (0.0498)
△ Exports diversivication	0.071* (0.0398)	0.044 (0.0338)	0.064 (0.0534)	0.076* (0.0431)
△ FDI*public invest	0.276*** (0.0652)	0.220** (0.0578)	0.116** (0.0453)	0.264*** (0.0665)
△ FDI*exports divers	0.283*** (0.0712)	0.186* (0.0712)	0.321** (0.1193)	0.278*** (0.0698)
△ FDI*exchange rate	-0.053* (0.0306)	-0.075* (0.0396)	-0.052 (0.0658)	-0.061* (0.0322)
Constant	2.896*** (0.6213)	2.658*** (0.5424)	2.674*** (0.4362)	2.539*** (0.4156)

Table 2.9 Estimation for period 1980-2007 (before 2008's economic crisis) and 2008-2017 (after 2008's crisis).

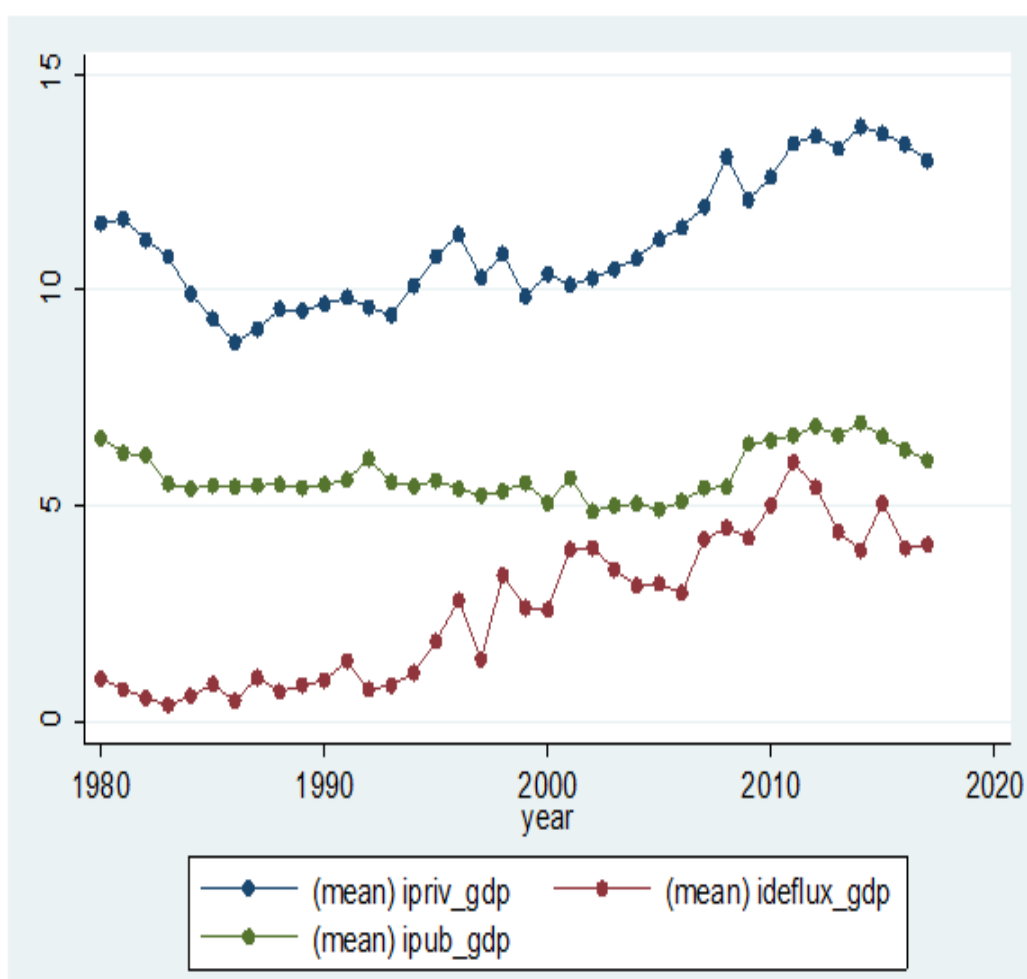
Variables	(1)	(2)	(3)
Long term coefficients			
FDI inflows	0.309*** (0.0521)	0.278*** (0.0591)	0.288*** (0.0793)
Public investment	-0.098** (0.0395)	-0.089* (0.0470)	-0.118** (0.0445)
Financial development	0.308** (0.1162)	0.203*** (0.0621)	0.315*** (0.0881)
Inflation	-0.103* (0.0544)	-0.109* (0.0581)	-0.081* (0.0462)
productivity	0.426*** (0.0946)	0.598*** (0.1032)	0.489*** (0.1137)
Debt	-0.107* (0.0578)	-0.167* (0.0954)	-0.196** (0.0790)
Political stability	-0.251*** (0.0657)	-0.486*** (0.0972)	-0.472*** (0.1258)
Exchange rate	-0.088* (0.0494)	-0.090* (0.0470)	-0.084* (0.0444)
Corruption	-0.101* (0.0528)	-0.078* (0.0421)	-0.062* (0.0360)
Exports diversivication	0.073* (0.0417)	0.060* (0.0310)	0.079* (0.0441)
FDI*publique invest	0.238*** (0.0553)	0.286*** (0.0732)	0.225*** (0.0578)
FDI*exports divers	0.371*** (0.1042)	0.289*** (0.0831)	0.249*** (0.0625)
FDI*exchange rate	-0.078* (0.0433)	-0.043* (0.0226)	-0.045* (0.0252)
Error correction term	-0.253*** (0.0527)	-0.345*** (0.0756)	-0.289*** (0.0459)
Short term coefficients			
ΔFDI inflows	-0.106* (0.0572)	-0.057* (0.0309)	-0.078* (0.0412)
ΔPublic investment	0.217** (0.0789)	0.248** (0.0887)	0.214** (0.0835)
ΔFinancial development	0.237** (0.0967)	0.283*** (0.0658)	0.348*** (0.0773)
Δ Inflation	0.086* (0.0472)	0.053* (0.0278)	0.085* (0.0488)
Δ Productivity	0.326*** (0.0724)	0.316*** (0.0685)	0.389*** (0.1010)
Δ Debt	0.058 (0.0471)	-0.098* (0.0518)	-0.156** (0.0618)
Δ Political stability	-0.243*** (0.0574)	-0.236*** (0.0502)	-0.249*** (0.0629)
Δ Exchange rate	0.039 (0.0453)	0.043* (0.0226)	0.068* (0.0359)
Δ Corruption	-0.035 (0.0783)	-0.052 (0.0764)	-0.049 (0.0764)
Δ Exports diversivication	0.071* (0.0398)	0.040 (0.0363)	0.058 (0.0544)
Δ FDI*publique invest	0.276*** (0.0652)	0.207** (0.0716)	0.241** (0.0899)
Δ FDI*exports divers	0.283*** (0.0712)	0.189*** (0.0575)	0.216*** (0.0571)
Δ FDI*exchange rate	-0.053* (0.0306)	-0.053* (0.0278)	-0.075* (0.0419)
Constant	2.896*** (0.6213)	3.154*** (0.5087)	2.895*** (0.6433)

Figure 2.4 Greenfield FDI versus MA FDI



Source: World Bank data.

Figure 2.5 Correlation between FDI, domestic private and public investment.



Source: IMF investment capital stock data, UNTCAD.

Table 2.10 List of countries.

Angola	Lesotho
Benin	Madagascar
Botswana	Malawi
Burkina Faso	Mali
Burundi	Mauritania
Cabo Verde	Mauritius
Cameroon	Mozambique
Central African Republic	Namibia
Chad	Niger
Comoros	Nigeria
Côte d'Ivoire	Rwanda
Dem. Rep. of the Congo	Sao Tome and Principe
Equatorial Guinea	Senegal
Eswatini	Sierra Leone
Ethiopia	South Africa
Gabon	Tanzania
Ghana	Togo
Guinea	Uganda
Guinea-Bissau	Zambia
Kenya	Zimbabwe

3

Chapter 2. Remittances and domestic private investment in Sub-Saharan african countries: how local financial development matter?

Joint work with Mohamed BOLY. ¹

3.1 Introduction

The COVID 19 pandemic highlighted the crucial role played by migrant remittances in building the resilience of developing countries. For Sub-Saharan African countries, remittances have grown rapidly since the early 1990s, and are now one of the most important forms of cross-border capital flows to countries of the region. Over the past three decades, the volume of remittances has quadrupled, to reach more than 40 US billion dollars representing more than 2.6% of GDP World Bank , WDI (2023). Remittances are now exceeding official development assistance and are the most important source of foreign capital inflows to SSA countries after foreign direct investment. In a context of limited financial resources, remittances represent an important financial instrument to influence economic development in these countries. In fact, most countries in Sub-Saharan Africa face financing deficits

¹World Bank Washington D.C, USA.

that constrain their development and thus need financial inflows to invest in infrastructure, technology and human capital. Remittances potentially generate significant benefits for recipient countries. At the macro level, they tend to be more stable than other sources of foreign funds, compared to traditional sources of financing, such as official development assistance, which have generally proven to be unpredictable. Their variation is often counter-cyclical, helping to maintain macroeconomic stability in times of recession. They can also improve the solvability of countries by increasing the level and the stability of their foreign currency stock. At the micro level, remittances can contribute to poverty reduction by increasing household incomes. They also provide insurance against adverse shocks by helping to diversify household income sources. However, while most economists agree on the potentially positive effects of remittances, others point to the distortions created by the existence of in the labour market. Remittances may induce recipients to reduce their efforts or time spent at work. An increase in the wealth of recipients could lead to dependency effect, and create a moral hazard problem. Airola (2007); Amuedo-Dorantes and Pozo (2006); Drinkwater et al. (2009); Funkhouser (1995). Remittances can also pose a macroeconomic challenge for countries through the appreciation of exchange rates that they can generate.

These conflicting effects of remittances are therefore the subject of empirical and theoretical debate among economists. One issue arising recently in the wake of the growing inflow of remittances to developing countries is the question of how remittances can contribute to enhanced domestic capital accumulation through domestic investment. The question has emerged in a context where the common perception that tends to emerge from theoretical and empirical literature is that remittances are generally oriented towards consumption by recipient households. On the basis of these observations, our study investigates how the structure of local financial development can condition the effect of migrant remittances on domestic investment in Sub-Saharan African countries.

Due to the relatively low level of financial and capital market development in Sub-Saharan Africa, banks tend to be highly dependent on deposits for funding. For example, in 2017, over 60% of banks' financing sources were made up by deposits. Thus, if remittances enter banking institutions in the form of deposits, for example, this reinforces their capital for loans to investment (EIB, 2018). In this context, we argue that the level of financial development can condition the impact of remittances on domestic investment in sub-Saharan African countries. Although the link between remittances and consumption has been widely documented, empirical studies on the macroeconomic impact of remittances on private investment remain limited. The objective of our study is therefore to contribute empirically to the international debate on the impact of remittances by including financial development in order to understand how it can condition the impact of remittances on private investment in Sub-Saharan African countries.

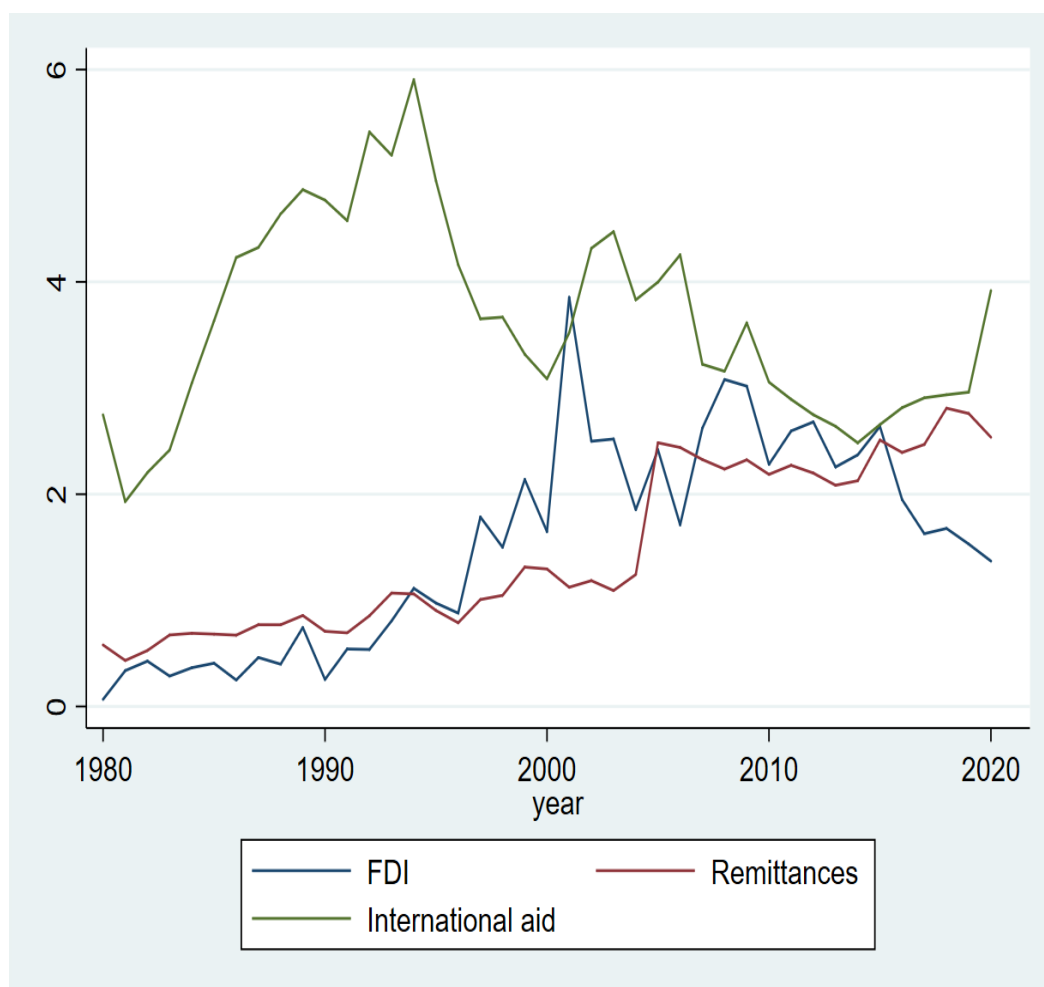
The study is divided into three main sections. The first section provides an overview of recent remittance trends and developments in Sub-Saharan Africa. The second reviews the theoretical and empirical literature on the relationship between remittances, investment and financial development. The third section is devoted to the empirical analysis. The last section provides a conclusion and discussion.

3.2 Remittances in Sub-Saharan Africa: trends and stylized facts.

In this section, we provide some stylized facts on remittances, financial development and investment in Sub-Saharan African countries. Figure 1 illustrates the trend of Remittances in Sub-Saharan Africa since 1980 compared to other international capital flows (FDI and

international aid).

Figure 3.1 Remittances trend in Sub-Saharan Africa (1980-2021): a comparaison with FDI and international aid.



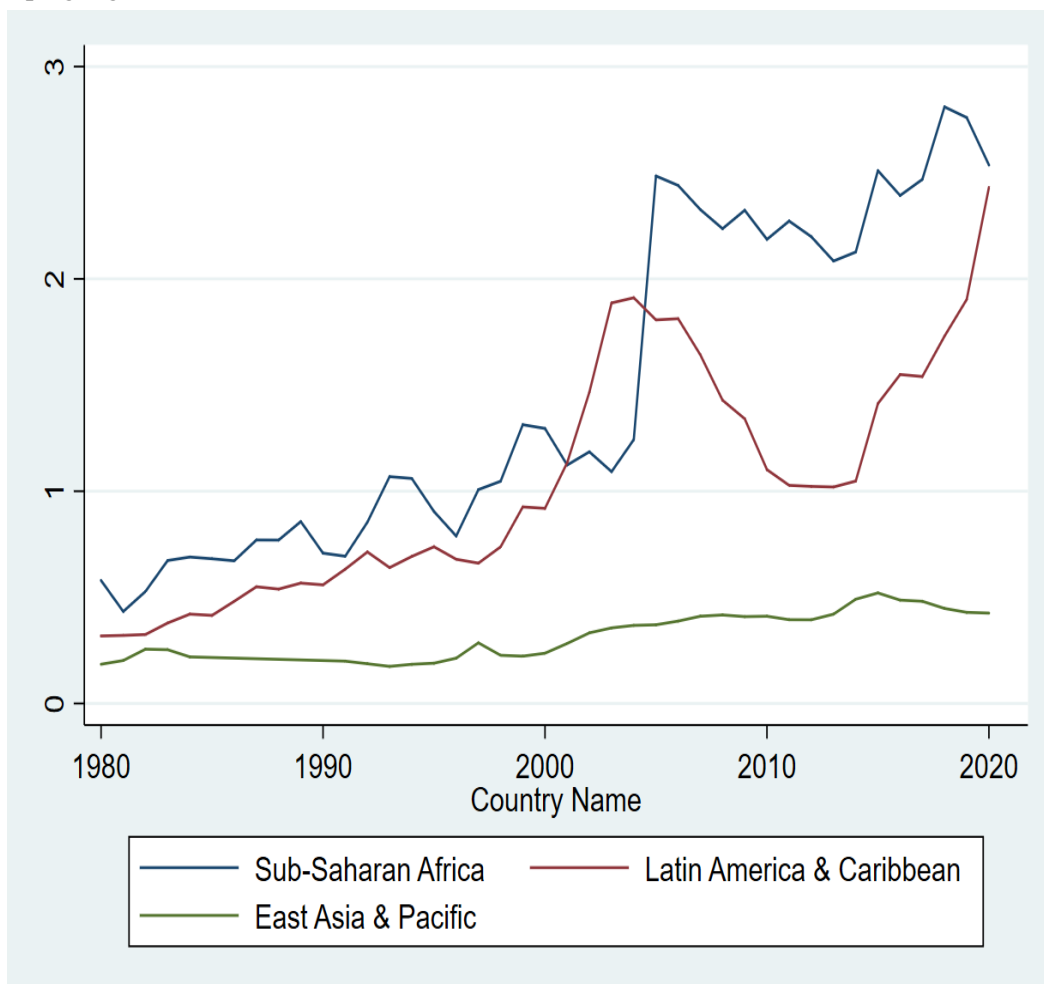
Source: World Bank data.

The first observation that can be drawn is that over the last few years, global remittance flows have steadily increased in the countries of the Sub-Saharan Africa. From less than 1% of GDP in the 1990s, remittances have risen to over 3% of GDP since 2020. These statistics could increase significantly if informal remittances are taken into account. The second observation is that remittances now exceed Foreign Direct Investment (FDI) and are now comparable to Official Development Assistance (ODA), which has long been the main

source of external financing for the countries in the region. The acceleration of remittances can be explained in part by the increase of migration in the region over the past few years (more than 20 million migrants according to the International Organization for Migration). This acceleration is also due to the development of new technologies that have contributed to reduce the costs of money transfers.

A comparative analysis with other developing regions (see figure 2) also shows that the share of remittances in the GDP of Sub-Saharan African countries is higher, reflecting the essential role played by remittances in these economies.

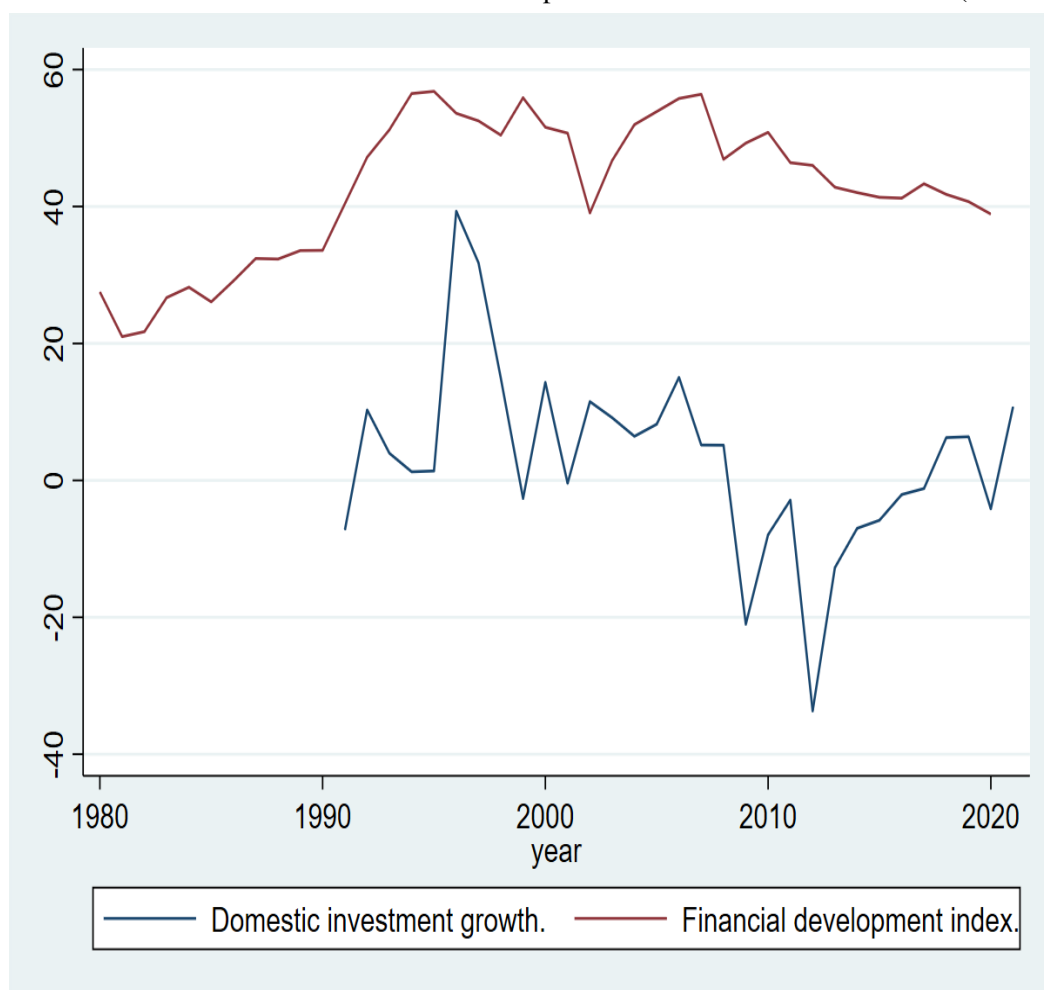
Figure 3.2 Remittances trend in Sub-Saharan Africa (1980-2021) : a comparaison with others developing regions.



Source: World Bank data.

The other observation that we can draw is that financial development (measured here by credit to the private sector) is low in Sub-Saharan Africa (see figure 3). We can observe that its average share is less than 40% (in comparison, in other developing regions such as Asia, it exceeds 100% of GDP). Although financial sectors have grown in most Sub-Saharan African countries since the early 1990s, their scope remains more limited than in the rest of the world. The same figure shows that private investment is highly volatile. The weakness of financial development certainly explains this volatility, as empirical work shows that in Sub-Saharan Africa, companies, entrepreneurs and households have difficulty to access credit, even with limited maturities.

Figure 3.3 Private investment and financial development trend in Sub-Saharan Africa (1980-2021).



Source: World Bank data.

3.3 Literature review

The issue of migrant remittances is particularly important in economic literature. Over the last fifty years, the impact of remittances on the economic development of recipient countries has been the subject of an ongoing and sometimes animated debate, opposing the views of migration optimists and pessimists.

At the end of the 1980s and beginning of the 1990s, analyses of the short-term impact of remittances gradually gave way to longer-term analyses, aiming to identify the transmission channels through which remittances could be favourable or harmful to the development of the recipient economies. These studies focus in particular on the determinants of remittances, the channels used by these funds and the economic impact of such transfers on the recipient countries. To this end, many economists have conducted empirical studies on various aspects of remittances, such as the motivation for sending remittances, their impact on household spending, and their impact on economic growth. Concerning the links between remittances and household spending, the debate initially focused exclusively on the use of remittances. Indeed, when migrants send remittances to their families, the essential question that arises is what types of expenditure these remittances allow to finance. The economic literature on the impact of remittances in recipient countries can be organized into two groups. Microeconomic studies aiming to understand the uses of transfers received by households. These studies generally focus on a sample of several households in a single country. Studies at the macroeconomic level, which are based on data from a panel of several countries, aiming to understand the impact of transfers on economic growth, exchange rates, investment and financial markets.

3.3.1 Literature on the effects of remittance at microeconomic level.

In the literature at the microeconomic level, the findings on the impact of transfers in recipient countries are conflicting. Some studies have not found a positive relationship between remittances and development, arguing that remittances are mainly used for consumption, non-productive investments, and that these types of expenditures tend to have few positive spillovers. Rempel and Lobdell (1978) note that remittances are mainly spent on daily consumption needs. Lipton (1980) finds that purchases of consumer goods related to daily needs absorb about 90% of remittances received in developing countries. Using nationally representative household data in Guatemala to study how the receipt of domestic and international remittances affects household spending behavior, Adams Jr and Cuenquecha (2010) show that households receiving remittances spend more on the main consumption item, food, than they would have without the remittances. Similarly, Massey and Parrado (1998) showed that more than 60 percent of remittances from Mexican migrants were used for consumption. In the same vein, and by applying the econometric technique of propensity score matching to the Tajikistan data, Clément (2011) comes to the conclusion that migrant remittances are not used productively by recipient households, insofar as remittances are used more for consumption than for investment expenditures. According to this author, remittances are interpreted as short-term strategies that help vulnerable households reach a basic level of consumption. In the same vein, Meka'a (2015), analyzes, for the case of Cameroon, how internal or international remittances received affect the spending behavior of households. He finds that households receiving international remittances allocate a significant share of their expenditure to consumer goods.

Concerning more precisely the relationship between migrant remittances and investment, the empirical, studies have focused mainly on Latin America and Asia. Using data collected in Mexico, López-Feldman and Escalona (2017) show that remittances contribute to increasing the productivity of households living in rural areas, due to an increase in investment. These

authors thus consider that remittances play a vital role because they provide households with potential sources of investment, which are particularly important in the context of the imperfect credit and insurance markets that prevail in most developing countries. They find that remittances can be used to cover expenses incurred in the agricultural production cycle (purchase of seeds and inputs, equipment rental, etc.). In the case of Mexico, Woodruff and Zenteno (2007) highlighted the fact that remittances reduced credit constraints in recipient households and encouraged investment in small and medium-sized enterprises. A study on the impact of migrant remittances on education in El Salvador, Edwards and Ureta (2003) found that international remittances have a positive impact on investment in education. Salas (2014) investigated the effect of international remittances in Peru using data for the period 2007-2010 and found that remittances had a positive effect on investment in human capital. Calero et al. (2009) investigated the impact of remittances on human capital investment in Ecuador between 2005 and 2006. They found that remittances do play a role as an investment resource in human capital. Buckley and Buckley and Hofmann (2012) compared remittance and non-remittance households in Tajikistan, a highly remittance-dependent country in Asia over the period 1999-2007. Their empirical results suggest that remittance-receiving households did not invest more than non-receiving households over the period studied. In a study measuring the effects of temporary labor migration on agricultural production in countries of origin, Lucas (1987) concluded that migration contributes in the long term to increased agricultural productivity in South Africa through the investment of remittances. He finds that remittances help ease families' budget constraints and enable them to invest more in agriculture. A study on Turkey shows that while consumption smoothing is a primarily short-term objective for remittance-receiving households, they have longer-term investment motivations Alper and Neyapti (2006).

3.3.2 Literature on the effects of remittance at macroeconomic level

At the macro level, the results found in the empirical literature vary from one region to another with a lack of consensus. The studies emphasize the role of institutions, particularly the presence of an enabling legal, political and economic environment De Haas (2010); Ratha and Mohapatra (2007). In this sense, Catrinescu et al. (2009) state that institutions such as government stability, democratic accountability and law and order condition the effect of remittances on investment and economic growth. Based on a sample of 70 developing countries, Bjuggren and Dzansi (2008) study the impact of remittances on investment and find that the use of remittances for investment can have a positive or negative effect depending on the level of institutional quality. Drinkwater et al. (2009), in a study of a panel of 20 developing countries between 1970 and 2000, find a positive impact of remittances on investment. In this respect, Brown (1994) examines the relationship between remittances, savings and investment in Tonga and Samoa and concludes that remittances contribute significantly to investment. Bouoiyour and Miftah (2014) investigated the relationship between financial development and remittances in the case of Morocco, and shows that remittances have no impact on investment. Mallick (2012) has studied the relationship between remittances and private investment in India from 1966 to 2005. The results show that remittances had a negative impact on private investment in India over the period studied. He explains this by the fact that remittances lead to a situation of moral hazard or dependency syndrome, which encourages recipients to reduce their participation in productive activities. Tran et al. (2012) studied the impact of remittances on investment and job creation in the informal sector in Vietnam. The results show that remittances had no impact on investment.

3.4 Data

The data measuring private investment as a percentage of GDP are collected from the Investment capital stock database of the International Monetary Fund (IMF). Other variables are extracted from Global Financial Development, Financial Structure database, World Development Indicators (WDI) of the World Bank and the United Nations Conference on Trade and Development (UNCTAD). We have constructed a panel for 46 African countries covering the period 1980-2019, excluding countries with insufficient data (Somalia, Southern Sudan , Sao Tome and Principe).

3.4.1 Measurement of remittances and Financial development indicators

Remittances are measured as a percentage of GDP using the IMF remittances definition which consider remittances as transfers made by migrants to their country of origin. Official data on remittances sent by migrants to their country of origin are, collected and recorded in the balance of payments, in line with the standardized methodology defined by the International Monetary Fund (IMF) (Balance of Payments Manual, fifth edition, 1993) in the current account, under the category of "private current transfers", when migrants have been living for more than a year in a country other than their country of nationality.

Financial development indicators in a country can be divided into two main categories: those related to the banking sector and those related to the stock market Levine (1997); Levine et al. (2000). In our case, we use indicators related to the banking sector, as banks remain the dominant institutions providing credit in Sub-Saharan Africa. We classify our indicators into two groups: indicators of financial deepness and indicators of access to financial services.

Following the definition Levine (1997); Levine et al. (2000), we used the following indicators to measure the deepness of financial development: total domestic credit provided

to private sector as a percentage of GDP, total bank deposits as a percentage of GDP, total bank liquidity as a percentage of GDP, total bank liability as a percentage of GDP. Domestic credit to private sector refers to financial resources provided to the private sector, such as loans, purchases of non-equity securities, trade credits and other accounts receivable, which establish a repayment claim. Its advantage is that it measures the degree of financial intermediation in a country. In our case, the other three indicators: total bank deposits as a percentage of GDP, total bank liquidity as a percentage of GDP, total bank liability as a percentage of GDP, allow us to have a broader measure of financial development by taking into account the value of financial sector liabilities, as the traditional indicator used (credit to the private sector) measures more the value of financial sector assets in a country. Deposits comprise savings deposits in deposit banks and other financial institutions as a percentage of GDP. The ratio of liquid assets to GDP that we use is equal to money plus the demand and interest-bearing liabilities of banks and other financial institutions. Liquid liabilities are also known as broad money or M3. This is the sum of currency and central bank deposits (M0) , plus transferable deposits and e-money (M1), plus time and savings deposits, transferable foreign currency deposits, certificates of deposit, and repurchase agreements (M2), plus travelers' checks, foreign currency time deposits, commercial paper and shares in mutual funds or collective investment schemes held by residents.

In terms of access to financial services, we use two indicators: the bancarisation rate and banking density. The bancarisation rate measures the percentage of the adult population (age 15+) holding an account in banks, postal services or national savings banks. Banking density measures banking coverage in terms of the number of branches open in a country. All these variables come from the World Bank's World Development Indicators database.

3.4.2 Macroeconomic environment variables.

As Sub-Saharan African countries have implemented numerous liberalization and privatization reforms under the guidance of the World Bank and the IMF to foster private sector development, the macroeconomic environment has become a fundamental determinant of private investment. We have therefore paid particular attention to macroeconomic stability approximated by inflation, public investment, FDI inflows, current account deficit, economic growth, population. In the case of Sub-Saharan African countries, the literature has shown the essential role of these variables in private investment behavior Frimpong and Marbuah (2010); Jecheche (2011); Mbanga (2002); Ngoma et al. (2019). Inflation is generally perceived as a variable that increases the cost of capital, which in turn reduces its accumulation. However, higher inflation lowers the real interest rate, which can potentially increase real investment Ghura and Goodwin (2000). Public investment in infrastructure provision for transport, communication, energy, and human capital complement private investment. In the form of infrastructure, public capital can have a major impact on investment productivity. One example is the role played by services such as transport in the production and distribution of goods. But it may also crowd it out if it competes with private sector investment, or if public spending is financed by a deficit, raising interest rates and the cost of capital for the private sector. The relation between these two variables is ambiguous.

The two following tables summarize all the variables with their sources and descriptive statistics, respectively.

Table 3.1 Summary of varibales.

Variables	Sources	Expected sign
Private investment (PRINV)	IMF	
Remittances as a percentage of GDP (REM)	World Bank	+/-
Total domestic credit as a percentage of GDP (FINDEV1)	World Bank	+
Total banking deposit as a percentage of GDP (FINDEV2)	World Bank	+
Total liquidity as a percentage of GDP (FINDEV3)	World Bank	+
Total liabilities as a percentage of GDP (FINDEV4)	World Bank	+
Debt (DEBT)	World Bank	+/-
Growth (GROWTH)	World Bank	+/-
Inflation (INF)	World Bank	+/-
Foreign Direct Investment (FDI)	UNCTAD	+/-
Current account (CUR)	IMF	+/-
Percentage of population having access to bank (BAN)	World Bank	+
Total banks for 100,000 adults (BCO)	World Bank	+
Population (POPULATION)	World Bank	+/-
Consumption (CONS)	World Bank	+/-

Source: see above and complication by the authors

Table 3.2 Descriptives statistics.

VARIABLES	N	mean	sd	min	max
REM	1,475	4.776	18.89	0	235.9
FINDEV1	1,574	18.08	20.44	0	160.1
FINDEV2	1,613	26.89	49.82	0.00618	820.3
FINDEV3	1,607	31.75	47.51	0.0283	890.0
FINDEV4	1,589	23.55	37.78	0.0265	770.3
PRINV	1,798	14.79	9.757	0.00102	95.34
PUB	1,798	6.969	5.428	0.000769	40.90
FDI	1,725	3.123	8.042	-28.62	161.8
CUR	1,440	-5.459	10.89	-148.0	62.30
DEBT	1,588	55.95	46.20	3.533	426.4
GROWTH	1,731	3.857	6.981	-50.25	150.0
INF	1,481	40.97	645.9	-17.64	23,773
BAN	659	6.057	8.540	0.140	55.07
BCO	103	25.177	18.453	1.520	89.49
POP	1,800	15.60	1.513	11.06	19.13
CONS	1,476	71.50	17.70	9.834	139.2

3.5 Empirical methodology.

This study employed the following panel data methods: Ordinary Least Squares (OLS), the FE-estimator and the RE-estimator, Feasible Generalised Least Squares (FGLS) and Quantile regression. The FE-estimator allows the unobserved effects (country specific effects) to be correlated with the regressors, while the RE-estimator does not allow for such correlation. Both the FE- and RE-estimators are consistent when the unobserved effects are uncorrelated with the observed regressors. However, only the FE-estimator is consistent when the unobserved effects are correlated with the observed regressors. Hence, the appropriateness of the estimator (FE-estimator or RE-estimator) is determined by testing whether the unobserved effects are correlated with the regressor. This is known as the Hausman test. An important assumption for both the FE and RE estimators is that the

idiosyncratic errors must be homoskedastic and uncorrelated across time. If the assumptions of the errors are violated, the FE estimator will still be a consistent estimator, but will be an inefficient and biased estimator Baltagi (2005). It is very likely that our model exhibits heteroskedasticity or serial correlation. To correct for serial correlation and heteroskedasticity, our model will be estimated using Feasible Generalised Least Squares FGLS. We also use the Quantile regression method known to be more informative than OLS methods. What's more, they allow us to have regressions not only at the center of the distribution, but also at the extremes. In our case, this will enable us to study the effect of remittances in different classes of countries, since we are considering different levels of financial development. It has also been shown that the quantile regression estimator is preferable to the OLS estimator when the error term does not follow a normal distribution.

We specify the model as follows:

$$PRINV_{it} = \beta_0 + \beta_1 REM_{it} + \beta_i X_{it} + \mu_{it} \quad (3.1)$$

$$PRINV_{it} = \beta_0 + \beta_1 REM_{it} + \beta_2 FINDEV_{it} + \beta_3 (REM * FINDEV)_{it} + \beta_i X_{it} + \mu_{it} \quad (3.2)$$

- $PRINV_{it}$ Domestic Private investment,
- REM_{it} Remittances,
- $FINDEV_{it}$ Financial development index (measured by: total domestic credit as a percentage of GDP, total banking deposits as a percentage of GDP, total liquidity as a percentage of GDP, total banking liabilities, degree of bancarisation, and the rate of

bank penetration among the population.)

In equations (2), the interaction term indicates that the effect of remittances on private investment may differ depending on the level of financial development. The effect of remittances on investment is not limited to β_1 but also depends on the value of β_2 and the level of financial development. In other words, β_1 and β_2 provide information about the marginal impact of remittances on investment given financial development. For example, in equation (2), if β_1 is positive and β_2 is negative, this indicates that remittances are more effective in stimulating investment in countries with low financial development. In other words, a negative interaction means that remittances have de facto replaced financial services to stimulate investment. On the other hand, if the effect of remittances is negative and significant, a positive interaction suggests that remittances and the financial system are complementary (a better functioning financial system allows the stimulating effect of remittances on investment).

Our control variables are :

- $DEBT_{it}$ Debt
- FDI_{it} foreign direct investment,
- PUB_{it} Public investment,
- INF_{it} inflation,
- CUR_{it} Current account,

- $GROW_{it}$ growth,
- POP_{it} population,

3.6 Results.

This section presents the results of our different estimations. Table 3 in Annex 2 presents the results of regressions with the OLS, FE, RE, FGLS and Quantile regression estimators. Given that FGLS and Quantile regression estimators are more appropriate, we will base our analysis on these estimators in the rest of the paper.

First, our results confirm the empirical findings on the role of macroeconomic environment as determinants of private investment in developing countries. Economic growth has a positive and significant effect on private investment. Economic growth reflects the dynamics of economic activity. It also corresponds to an increase in a country's prosperity and therefore to an increase of the national income. This additional income will allow an increase in the demand for goods and services. Through the "Accelerator" mechanism, domestic firms will respond to this demand by investing. We observe a negative effect of public debt on investment. We find a negative effect of public debt on investment. In fact, an excessive accumulation of budget deficits can have a negative impact on private investment by pushing up interest rates. Public investment has a positive and significant effect. This could be due to the effects of public investment in infrastructure building, education and health care that provides a stimulating environment for private investment. We also find a positive effect of foreign direct investment on private investment. These positive effects could derive from the fact that the entry into the domestic market of multinationals could promote the diffusion of new production processes and technologies, new products and management

skills. As some multinationals acquire labor and raw materials locally, they may create new demands for local inputs for local firms and generate labor income that stimulates local demand and encourages domestic investment. We find an insignificant effect for inflation and the current account deficit.

When it comes to the impact of remittances on private investment, the relationship appears to be positive and significant. Our result is consistent with some empirical evidence from previous studies carried out for other developing countries in the Latin American region Conway and Cohen (1998); López-Feldman and Escalona (2017); Massey and Parrado (1998). However, this result is not consistent with previous results in the case of countries in the Asia-Pacific region that have shown a negative impact of remittances on private investment Buckley and Hofmann (2012); Mallick (2012); Maphosa (2007); Petrou and Connell (2017).

In Table 4 Annex 2, we now integrate financial development using the following four variables: total domestic credit, total banking deposits, total banking liquidity, total banking liabilities bank. In columns (1) to (4) we integrate the financial development variables without making interactions with remittances. The coefficients of remittances are always positive and significant. All the coefficients of the financial development variables are positive and significant. The development of the financial sector is therefore important in the growth of private investment. Well-developed and functioning financial sectors are needed to facilitate the accumulation of physical capital through investment and technological innovation Levine et al. (2000). Śledzik (2013) argues that through the allocation of savings in the economy, financial intermediaries promote investment, productivity growth and technological innovations. In this regard, King and Levine (1993); Levine (1997); Levine et al. (2000) note that firms and industries that rely heavily on external financing are in a better position to accelerate investment growth in countries where the financial sector is well developed. The development of the financial sector improves effective access to financial services and products necessary for investment. It increases the flow of funds, which

stimulates consumption and investment. An effective intermediation process and an improved financial sector increase the scale of domestic saving and strengthen the effectiveness of a country's or region's monetary policy by ensuring that scarce financial resources are channelled to the priority beneficiaries and priority investments Asongu and Odhiambo (2019); Tchamyou (2020). In columns (5) to (8) of the same table 4 Annex 2 we now interact our financial development variables with remittances to understand how the level of financial development conditions the impact of remittances on domestic private investment. The interactions with the different variables of financial development gives significant negative and statistical coefficients. This means that the marginal effect of transfers on domestic investment decreases when financial development rises. In other words, remittances do have an impact on domestic private investment, but this impact is more important in countries where the financial sector is underdeveloped. Our empirical results can be explained by the fact that remittances are an alternative to finance investment in countries where the financial market is imperfectly and poorly developed. Our results also show that a high level of financial development reduces the impact of remittances on domestic investment as credit constraints decrease when financial development increase.

In many SSA countries, the level of financial development is particularly low (the average credit allocated to the private sector as a percentage of GDP is 18.08% in our sample, while in other developing regions, such as Asia, it exceeds 100% of GDP). Our empirical results therefore suggest that when financial markets are imperfect and weakly developed, remittances stimulate private investment by serving as a sort of alternative to credit and other forms of financing, which are most often inaccessible to populations with limited resources. When credit markets are imperfect, low-wealth individuals may have to sacrifice potentially profitable investment opportunities. Thus, remittances may help compensate a weak financial system by relaxing liquidity constraints and allowing potential entrepreneurs to engage in productive activities. When the financial constraint is relaxed, for instance

in rural Sub-Saharan Africa, the income from remittances can be used to invest in new income-generating activities through SMEs, especially in services and trading.

Several empirical studies demonstrate how imperfect credit markets in developing countries limit the ability of entrepreneurs to undertake productive investments Aghion et al. (1999); Banerjee and Newman (1993). In large parts of most of Sub-Saharan Africa, remittances are the primary and often the only source of income for individuals and families Ratha (2017). By increasing household income, they ease credit constraints, support local demand, and enable productive investments in infrastructure, services, and trade. Studies from Plaza et al. (2011); Wouterse (2011) have shown that in countries such as Côte d'Ivoire, Burkina Faso, Mali and Senegal, investment in certain types of assets such as investment in real estate (housing or real estate assets other than primary housing) has occurred. In these countries, remittance recipients are significantly more likely to have invested in agricultural assets and own real estate or a non-agricultural business. In some Sub-Saharan African countries, migrant remittances enable the economy to stay alive. The case of the Cape Verde archipelago in the Atlantic Ocean is the best known. Remittances account for 25-30% of the country's gross national product.

3.7 Robustness checks.

In this section, we present the robustness tests we conducted. To test how the link between remittances and private domestic investment varies according to different levels of financial development, we divided the sample between the least financially developed and the most financially advanced countries. Following the World Bank classification, we consider low-income countries to be the least financially developed, and countries classified as emerging markets to be the most financially advanced. Countries that are least developed in terms of financial development are those where credit to the private sector as a percentage of GDP is very low (in our sample, the average credit to the private sector for this group of

countries is only 13.40%). The most advanced countries in terms of financial development are economies where credit to the private sector as a percentage of GDP is relatively high (in the sample, the average for these countries is 35.60% of GDP). Table 5 in Annex 2 shows the results obtained. A comparison of columns (1) and (2) shows once again that the effect of remittances on domestic private investment tends to be more important in countries with a low level of financial development than in countries with a high level of financial development.

Since our results show that the effect of transfers on private investment decreases as financial development increases, we also analyzed the effect of remittances on consumption depending on the level of financial development. We used two strategies for this purpose. Firstly, by using the same classification method, i.e. by considering the group of emerging markets (considered as having a high level of financial development) and the group of low-income countries (considered as having a low level of development). In both cases, we first used the FGLS method and then the quantile regression method. The results are respectively presented in the tables 8 and 9 Annex 2. In table 8 columns (1) and (2) respectively compare the results obtained with the FGLS for the group of countries with a high level of financial development and those with a low level of financial development. Columns (3) to (6) compare the same samples for results obtained with quantile regression (25% and 50% quantiles respectively). We find that when financial development is high, the effect of transfers on consumption tends to be greater than when financial development is low. In other words, when financial development is high, remittances tend to be directed more towards consumption and less towards investment, as investment becomes less and less constrained when financial development is high. Secondly, we used the interactions between remittances and financial development indicators. Table 9 shows the results we obtained. We still find that when financial development is high, the effect of transfers on consumption tends to be more important than when financial development is low.

We used two indicators of financial inclusion to divide our sample between the least advanced countries in terms of financial development and the most advanced countries in terms of financial development. These indicators are the bancarisation rate (bank accounts per 1,000 adults) and banking coverage (bank branches per 100,000 adults). We ranked the groups of countries for these two financial inclusion indicators using the median method developed by Levine (1997). With this method, the least advanced countries in terms of financial development are those with values for their bancarization rate and banking coverage below the sample median, while the most advanced countries in terms of financial development have values above the median. Table 5 Annex 2 presents the results. Columns (3) and (4) in the same table compare countries on the basis of their bancarization rate, while columns (5) and (6) in the same table compare countries on the basis of their banking coverage. The results show that the effect of migrant remittances on domestic private investment tends to be greater in countries that are less advanced in terms of financial development than in countries that are more advanced in terms of financial development.

Given that a significant proportion of remittances originate in the developed countries of North America and Europe, developing countries receiving these funds tend to be more connected and more vulnerable to external shocks. Remittances are an important channel for economic spillovers from developed to developing countries. These remittances can be pro-cyclical with production in developed countries. We have considered two major crises that have affected developed countries. The 2008 global economic crisis, which caused major shocks to developed economies, and the 2011 debt crisis, which severely affected eurozone countries that receive a large number of migrants from Sub-Saharan Africa. We check whether our results are sensitive by excluding these years from our samples and re-estimating our equation. The results are presented in Table 6 Annex 2; they are robust to this specification.

In our sample, some countries such as Lesotho may appear to be outliers in terms of remittances. The maximum remittance value for this country is 235.92, compared with 28.16 for the rest of the sample. Its average is 92.56, compared with 2.40 for the rest of the sample. We look to see if our results are sensitive by excluding this country from our samples and re-estimate our equation. The results are presented in Table 7 Annex 2. Our results are robust to this specification.

3.8 Conclusion and discussion.

The objective of this article was to study empirically whether the development of the local financial sector is an important prerequisite for remittances to strengthen domestic private investment in the Sub-Saharan Africa region. In particular, the study aims to understand whether the impact of remittances on private investment depends on countries' financial development stages. Panel data methods such as feasible generalized least squares (FGLS), fixed effects estimator (FE), random effects estimator (RE) and Quantile regression are used to analyze the relationship between remittances, financial sector development, and domestic investment in a sample of 40 Sub-Saharan African countries over the period 1980-2019. A battery of financial development indicators such as the level of credit to the private sector, banking deposits, banking liquidity, bancarization rate, bank coverage rate. First, the empirical analysis shows that remittances have a positive impact on private investment in the region. Second, the study shows that the marginal effect of remittances on investment decreases as countries' level of financial development increases. Remittances have a greater impact in countries with a low level of financial development as they reduce credit constraints. In the light of the above findings, policy recommendations can be made to enable countries in the Sub-Saharan African region to better benefit from the impact of remittances on their domestic private investment.

In low-income countries in Sub-Saharan Africa, the costs of remittances remain particularly high. The average cost in 2019 was slightly above 8% while it is below 8% for most other developing regions. The costs of intra-African transfers are even higher, averaging nearly 14% . Reducing the costs of remittances to these countries could therefore boost remittance volumes and encourage migrants to use formal channels. High transfer costs reduce the amount that recipient households can collect and tend to push migrants to send money through informal channels, limiting their ability to invest. Promoting competition in remittance markets could help lower costs by attracting more services and different players. Governments in these countries must therefore discourage exclusive agreements between remittance service providers (such as commercial banks, post offices, credit unions, microcredit organizations and mobile money transfer services) and international money transfer agencies, which maintain high rates. Provision of information on available remittance channels, the development of databases on fares and the promotion of financial knowledge for potential migrants can strengthen competition in the market and encourage the use of formal channels. The development of financial sector infrastructure can increase the amount and flow of remittances sent.

The technological progress has enormous potential to improve competition and extend the scope of formal remittance markets. Money transfer services via cell phone networks have grown considerably in Sub-Saharan Africa. Governments can support this process by improving their telecoms infrastructure, harmonizing banking and telecoms regulations to enable major banks to participate in mobile money transfers.

As our results show, financial development has strong beneficial effects on private investment in the countries of the region. These countries should therefore have policies to develop their financial sector, for example, these countries should formulate policies to encourage the development of effective and efficient financial institutions and markets that meet the needs of economies in terms of private investment. Examples of policies aimed at

strengthening the financial sector include the development of human capital in this sector, the maintenance of good governance and the encouragement of collaboration between developed countries, developing and least developed countries.

3.9 Annex 2.

Table 3.3 Remittances and domestic private investment.

VARIABLES	OLS	FE	RE	FGLS
Remittances	0.0750*** (0.0139)	0.143*** (0.0132)	0.139*** (0.0132)	0.0822*** (0.0101)
FDI	0.321*** (0.0495)	0.159*** (0.0396)	0.177*** (0.0393)	0.344*** (0.0501)
Growth	0.00862 (0.0591)	-0.0209 (0.0413)	-0.0153 (0.0417)	0.0955** (0.0432)
Inflation	0.00135 (0.00204)	0.00330** (0.00142)	0.00297** (0.00143)	0.00158 (0.00139)
Publique investment	0.265*** (0.0564)	0.163*** (0.0462)	0.172*** (0.0462)	0.150*** (0.0447)
Debt	-0.0179*** (0.00656)	-0.00762 (0.00603)	-0.0128** (0.00579)	-0.0266*** (0.00561)
Current account	0.00724 (0.0345)	-0.225*** (0.0274)	-0.209*** (0.0274)	0.0196 (0.0260)
Population	0.0110 (0.189)	3.433*** (0.762)	1.568*** (0.503)	0.0273 (0.109)
Constant	13.63*** (3.120)	-41.50*** (12.22)	-12.26 (8.128)	13.52*** (1.882)
Observations	975	975	975	975
R-squared	0.144	0.234		
Contries	40	40	40	40

Table 3.4 Remittances, domestic private investment and financial development.

VARIABLES	Bank credit	Bank deposit	Bank liquidity	Bank liability	Bank credit	Bank deposit	Bank liquidity	Bank liability
Remittances	0.0862*** (0.0106)	0.0855*** (0.0104)	0.0879*** (0.0102)	0.0869*** (0.0101)	0.0999*** (0.0115)	0.106*** (0.0111)	0.108*** (0.0110)	0.109*** (0.0108)
FDI	0.320*** (0.0509)	0.335*** (0.0596)	0.540*** (0.0710)	0.556*** (0.0709)	0.308*** (0.0502)	0.343*** (0.0586)	0.545*** (0.0698)	0.558*** (0.0693)
Growth	0.104** (0.0446)	0.0999** (0.0440)	0.0854** (0.0430)	0.0823* (0.0432)	0.111** (0.0447)	0.102** (0.0440)	0.0909** (0.0436)	0.0909** (0.0436)
Inflation	0.0180 (0.0122)	0.00183 (0.00139)	0.00193 (0.00151)	0.00187 (0.00153)	0.0148 (0.0122)	0.00178 (0.00116)	0.00194* (0.00116)	0.00196 (0.00120)
Public investment	0.176*** (0.0475)	0.160*** (0.0467)	0.132*** (0.0457)	0.130*** (0.0455)	0.169*** (0.0468)	0.155*** (0.0453)	0.124*** (0.0443)	0.122*** (0.0440)
Debt	-0.0317*** (0.00615)	-0.0277*** (0.00576)	-0.0285*** (0.00563)	-0.0296*** (0.00553)	-0.0358*** (0.00630)	-0.0339*** (0.00577)	-0.0342*** (0.00563)	-0.0350*** (0.00546)
Current account	0.00760 (0.0272)	0.00836 (0.0265)	0.0127 (0.0263)	0.0166 (0.0261)	-0.00824 (0.0276)	-0.0208 (0.0266)	-0.00962 (0.0262)	-0.0112 (0.0259)
Population	-0.0593 (0.119)	0.0712 (0.111)	0.145 (0.110)	0.123 (0.111)	-0.0624 (0.116)	0.0386 (0.106)	0.0918 (0.107)	0.0607 (0.106)
Bank credit	0.0114*** (0.00428)				0.0124*** (0.00441)			
Bank deposit		0.00832* (0.00428)				0.00846** (0.00408)		
Bank liquidity			0.0137*** (0.00423)				0.0153*** (0.00453)	
Bank liability				0.00813** (0.00335)				0.00957*** (0.00358)
Rem*Bank credit					-0.279*** (0.0888)			
Rem*Bank deposit						-0.394*** (0.0783)		
Rem*Bank liquidity							-0.396*** (0.0813)	
Rem*Bank liability								-0.422*** (0.0774)
Constant	14.18*** (2.007)	12.40*** (1.971)	10.89*** (1.934)	11.46*** (1.931)	15.14*** (1.993)	14.19*** (1.929)	12.99*** (1.893)	13.83*** (1.878)
Observations	924	940	937	937	918	932	929	929
Countries	40	40	40	40	40	40	40	40

Table 3.5 Remittances, domestic private investment and financial development.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.125*** (0.0118)	0.389*** (0.0946)	0.694*** (0.191)	0.0593*** (0.0118)	0.470** (0.187)	0.0665*** (0.0115)
FDI	0.331*** (0.0555)	0.131 (0.110)	0.759*** (0.136)	0.269*** (0.0484)	1.105*** (0.122)	0.233*** (0.0497)
Growth	0.0594 (0.0462)	-0.00781 (0.0795)	0.0623 (0.0540)	0.0245 (0.0555)	0.0502 (0.0499)	0.00111 (0.0620)
Inflation	0.00363 (0.0124)	0.00102 (0.00127)	0.0121 (0.0137)	0.000431 (0.00118)	0.0183 (0.0130)	0.000996 (0.00118)
Public investment	0.0778 (0.0474)	0.381*** (0.128)	-0.647*** (0.0971)	0.315*** (0.0524)	-0.279*** (0.0840)	0.246*** (0.0556)
Debt	-0.0213*** (0.00637)	0.0352** (0.0150)	-0.0170 (0.0107)	-0.00176 (0.00770)	-0.0424*** (0.00892)	-0.0103 (0.00768)
Current account	-0.0154 (0.0341)	-0.115*** (0.0439)	-0.351*** (0.0732)	0.0331 (0.0298)	0.0523 (0.0588)	0.0230 (0.0299)
Population	1.748*** (0.190)	-0.0986 (0.249)	1.677*** (0.432)	0.280** (0.124)	2.934*** (0.316)	0.0574 (0.144)
Constant	-15.42*** (3.163)	14.57*** (4.797)	-17.15** (6.876)	9.044*** (2.192)	-35.64*** (4.851)	13.30*** (2.483)
Observations	205	770	216	679	317	648
Countries	7	33	11	26	14	26

Table 3.6 Robustness taking into account business cycle in developed countries .

VARIABLES	Bank credit	Bank deposit	Bank liquiility	Bank liability	Bank credit	Bank deposit	Bank liquidity	Bank liability
Remittances	0.0862*** (0.0106)	0.0855*** (0.0104)	0.0879*** (0.0102)	0.0869*** (0.0101)	0.0999*** (0.0115)	0.106*** (0.0111)	0.108*** (0.0110)	0.109*** (0.0108)
FDI	0.320*** (0.0509)	0.335*** (0.0596)	0.540*** (0.0710)	0.556*** (0.0709)	0.308*** (0.0502)	0.343*** (0.0586)	0.545*** (0.0698)	0.558*** (0.0693)
Growth	0.104** (0.0446)	0.0999** (0.0440)	0.0854** (0.0430)	0.0823* (0.0432)	0.111** (0.0447)	0.102** (0.0440)	0.0909** (0.0436)	0.0909** (0.0436)
Inflation	0.0180 (0.0122)	0.00183 (0.00139)	0.00193 (0.00151)	0.00187 (0.00153)	0.0148 (0.0122)	0.00178 (0.00116)	0.00194* (0.00116)	0.00196 (0.00120)
Public investment	0.176*** (0.0475)	0.160*** (0.0467)	0.132*** (0.0457)	0.130*** (0.0455)	0.169*** (0.0468)	0.155*** (0.0453)	0.124*** (0.0443)	0.122*** (0.0440)
Debt	-0.0317*** (0.00615)	-0.0277*** (0.00576)	-0.0285*** (0.00563)	-0.0296*** (0.00553)	-0.0358*** (0.00630)	-0.0339*** (0.00577)	-0.0342*** (0.00563)	-0.0350*** (0.00546)
Current account	0.00760 (0.0272)	0.00836 (0.0265)	0.0127 (0.0263)	0.0166 (0.0261)	-0.00824 (0.0276)	-0.0208 (0.0266)	-0.00962 (0.0262)	-0.0112 (0.0259)
Population	-0.0593 (0.119)	0.0712 (0.111)	0.145 (0.110)	0.123 (0.111)	-0.0624 (0.116)	0.0386 (0.106)	0.0918 (0.107)	0.0607 (0.106)
Bank credit	0.0114*** (0.00428)				0.0124*** (0.00441)			
Bank deposit		0.00832* (0.00428)				0.00846** (0.00408)		
Bank liquidity			0.0137*** (0.00423)				0.0153*** (0.00453)	
Bank liability				0.00813** (0.00335)				0.00957*** (0.00358)
Rem*Bank credit					-0.279*** (0.0888)			
Rem*Bank deposit						-0.394*** (0.0783)		
Rem*Bank liquidity							-0.396*** (0.0813)	
Rem*Bank liability								-0.422*** (0.0774)
Constant	14.18*** (2.007)	12.40*** (1.971)	10.89*** (1.934)	11.46*** (1.931)	15.14*** (1.993)	14.19*** (1.929)	12.99*** (1.893)	13.83*** (1.878)
Observations	924	940	937	937	918	932	929	929
Countries	40	40	40	40	40	40	40	40

Table 3.7 Robustness excluding outliers.

VARIABLES	Bank credit	Bank deposit	Bank liquidity	Bank liability	Bank credit	Bank deposit	Bank liquidity	Bank liability
Remittances	0.195*** (0.0543)	0.146*** (0.0554)	0.178*** (0.0505)	0.162*** (0.0504)	0.442*** (0.0673)	0.460*** (0.0682)	0.535*** (0.0646)	0.539*** (0.0659)
FDI	0.292*** (0.0517)	0.308*** (0.0615)	0.526*** (0.0727)	0.555*** (0.0729)	0.268*** (0.0517)	0.298*** (0.0603)	0.511*** (0.0665)	0.535*** (0.0663)
Growth	0.0890** (0.0445)	0.0912** (0.0447)	0.0637 (0.0434)	0.0646 (0.0438)	0.0883** (0.0441)	0.0773* (0.0440)	0.0527 (0.0433)	0.0517 (0.0435)
Inflation	0.0206* (0.0125)	0.00165 (0.00141)	0.00171 (0.00153)	0.00162 (0.00156)	0.0156 (0.0122)	0.00137 (0.000983)	0.00154* (0.000898)	0.00145* (0.000862)
Public investment	0.347*** (0.0563)	0.314*** (0.0557)	0.264*** (0.0543)	0.255*** (0.0543)	0.320*** (0.0541)	0.296*** (0.0526)	0.250*** (0.0496)	0.237*** (0.0499)
Debt	-0.0269*** (0.00634)	-0.0251*** (0.00601)	-0.0253*** (0.00579)	-0.0269*** (0.00574)	-0.0283*** (0.00628)	-0.0289*** (0.00591)	-0.0276*** (0.00556)	-0.0289*** (0.00548)
Current account	-0.00157 (0.0303)	0.00312 (0.0299)	0.0149 (0.0296)	0.0214 (0.0296)	-0.0161 (0.0292)	-0.0183 (0.0288)	-0.00450 (0.0277)	0.00386 (0.0276)
Population	0.0655 (0.121)	0.201* (0.121)	0.283** (0.117)	0.233** (0.118)	0.190* (0.114)	0.330*** (0.115)	0.454*** (0.108)	0.355*** (0.109)
Bank credi	0.0163*** (0.00411)				0.0233*** (0.00443)			
Bank deposit		0.0111** (0.00461)				0.0186*** (0.00450)		
Bank liquidity			0.0159*** (0.00416)				0.0271*** (0.00456)	
Bank liability				0.00877*** (0.00320)				0.0164*** (0.00364)
Rem*Bank credit					-0.578*** (0.104)			
Remi*Bank deposit						-0.689*** (0.0985)		
logr_di08							-0.778*** (0.0909)	
logr_di05								-0.825*** (0.0924)
Constant	10.67*** (2.111)	9.205*** (2.187)	7.692*** (2.086)	8.819*** (2.083)	9.749*** (2.000)	8.420*** (2.074)	6.191*** (1.938)	8.519*** (1.928)
Observations	889	905	902	902	883	897	894	894
Number of contries	39	39	39	39	39	39	39	39

Table 3.8 Remittance, consumption and financial development (the dependent variable is consumption).

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.861*** (0.0487)	2.392*** (0.328)	0.980*** (0.121)	3.177*** (0.497)	0.932*** (0.0952)	2.802*** (0.574)
GDP per capita	0.0141 (0.0660)	-0.442** (0.223)	0.155 (0.132)	-0.372 (0.351)	0.0650 (0.104)	-0.226 (0.405)
Inflation	0.0628*** (0.0229)	-0.0907 (0.160)	0.0196 (0.0398)	-0.364 (0.261)	0.0604* (0.0314)	0.0586 (0.301)
Public investment	-0.776*** (0.0753)	-2.316*** (0.267)	-1.350*** (0.141)	-0.757 (0.499)	-0.760*** (0.111)	-2.541*** (0.577)
Debt	0.0154* (0.00801)	-0.112*** (0.0414)	-0.0579*** (0.0129)	-0.0712 (0.0653)	0.0422*** (0.0102)	-0.194** (0.0754)
FDI	-0.190** (0.0814)	-0.394 (0.301)	-0.505*** (0.140)	-0.813* (0.490)	-0.331*** (0.110)	-0.628 (0.566)
Constant	76.25*** (0.665)	69.59*** (2.501)	77.98*** (1.370)	46.54*** (4.901)	75.77*** (1.079)	73.23*** (5.661)
Observations	830	200	830	200	830	200
Countries	31	7	31	7	31	7

Table 3.9 Remittance, consumption and financial development (the dependent variable is consumption).

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Remittance	0.940*** (0.0608)	0.930*** (0.0626)	0.970*** (0.0623)	0.922*** (0.0626)	0.834*** (0.0579)	0.776*** (0.0606)	0.765*** (0.0604)	0.787*** (0.0600)
GDP per capita	0.0224 (0.0638)	0.0102 (0.0641)	0.0272 (0.0641)	0.0110 (0.0643)	-0.00798 (0.0619)	-0.0465 (0.0642)	-0.0460 (0.0645)	-0.0306 (0.0644)
Inflation	0.0447* (0.0242)	0.0344 (0.0245)	0.0448* (0.0243)	0.0352 (0.0244)	0.0525** (0.0250)	0.0423* (0.0254)	0.0550** (0.0251)	0.0421* (0.0255)
Public investment	-0.919*** (0.0830)	-0.941*** (0.0805)	-0.937*** (0.0807)	-0.948*** (0.0807)	-0.876*** (0.0796)	-0.853*** (0.0783)	-0.802*** (0.0783)	-0.867*** (0.0787)
Debt	0.0204*** (0.00790)	0.0234*** (0.00792)	0.0278*** (0.00782)	0.0242*** (0.00793)	0.0245*** (0.00767)	0.0306*** (0.00778)	0.0349*** (0.00751)	0.0303*** (0.00784)
FDI	-0.133 (0.0815)	0.0144 (0.0810)	0.0235 (0.0812)	-0.00387 (0.0805)	-0.120 (0.0860)	-0.0981 (0.0881)	-0.0969 (0.0891)	-0.0987 (0.0881)
Population	0.232 (0.256)	-0.404 (0.263)	-0.416 (0.276)	-0.448* (0.263)	0.106 (0.272)	-0.384 (0.264)	-0.578** (0.272)	-0.438* (0.265)
Bank credit	-0.0815*** (0.00503)				-0.0827*** (0.00537)			
Bank deposit		-0.0901*** (0.00949)				-0.128*** (0.0111)		
Bank liquidity			-0.0895*** (0.0113)				-0.149*** (0.0159)	
Bank liability				-0.102*** (0.0107)				-0.139*** (0.0127)
Rem*Bank credit					0.721*** (0.179)			
Rem*Bank deposit -						1.010*** (0.191)		
Rem*Bank liquidity							1.308*** (0.193)	
Rem*Bank liability								0.895*** (0.185)
Constant	72.48*** (4.405)	82.98*** (4.610)	82.90*** (4.822)	83.58*** (4.611)	72.26*** (4.678)	80.13*** (4.613)	82.30*** (4.794)	81.27*** (4.649)
Observations	987	1,01	1,01	1,01	937	958	958	958
Number of contries	37	37	37	37	37	37	37	37

Table 3.10 List of countries.

Angola	Kenya
Benin	Lesotho
Botswana	Liberia
Burkina Faso	Madagascar
Burundi	Malawi
Cabo Verde	Mali
Cameroon	Mauritania
Central African Republic	Mauritius
Chad	Mozambique
Comoros	Namibia
Congo. Democratic Republic of the	Niger
Congo. Republic of	Nigeria
Côte d'Ivoire	Rwanda
Djibouti	Senegal
Equatorial Guinea	Seychelles
Eritrea	Sierra Leone
Eswatini	South Africa
Ethiopia	Sudan
Gabon	Tanzania
Gambia. The	Togo
Ghana	Uganda
Guinea	Zambia
Guinea-Bissau	Zimbabwe

4

Chapter 3. Capital flight in Sub-Saharan African countries: how banking regulation and supervision matters?

A summarized French version of this paper has been published in *Revue d'Économie du Développement* ¹

4.1 Introduction

The global economy has been characterised by an increasing liberalisation of capital markets in recent decades. The consequence of this liberalisation is the emergence of an integrated global capital market. This new global environment of relatively weak capital controls should provide an efficient allocation of capital within countries through the mechanism of free international capital flows. At the same time, this strong trend towards financial integration has led to an increase of capital flight for developing countries. Since the 1980s, it has become a major concern for these economies. Capital flight exacerbates the problem of financial constraints and worsens the lack of resources for domestic investment. Much of funds leaving these countries is not taxed, which reduces the tax base as well as budgetary revenues needed to finance essential services such as health, education and infrastructures Ajayi (1995). It therefore weakens economic growth and negatively affects the development

¹<https://doi.org/10.3917/edd.362.0079>

of these countries Beja Jr (2006); Lessard et al. (1987). Evidence also shows that capital flight exacerbates the balance of payments crisis. Sub-Saharan Africa is particularly affected and handicapped by this problem. Countries in this region have experienced capital flight amounting to more than US 700 billion dollar since 1970 Ndikumana and Boyce (2018). The United Nations Economic Commission for Africa (UNECA) has estimated that between US 30 billion dollar and US 60 billion dollar has left the region each year since 1980.

In the existing literature, the concept of "capital flight" has been defined in several ways. Cuddington (1986) define it as a short-term outflow of private capital that occurs in response to "a political crisis, or economic policy failure". Lessard et al. (1987) perceive capital flight as "the acquisition or retention of a liability from non-residents because the owner fears that the value of his assets will be impaired if his liabilities continue to be held in the domestic market". This literature identifies two major causes of capital flight which are essentially macroeconomic instability and political instability.

Capital flight in Sub-Saharan Africa, however, appears to be paradoxical and contradicts the theoretical and empirical predictions that attribute it to macroeconomic instability and political instability. In fact, the various World Bank and IMF reports indicate that on the macroeconomic level, Sub-Saharan African countries as a whole are experiencing stability as a result of the structural adjustment policies of the 1990s. At the political level too, the situation is not particularly alarming since, with the exception of a few areas of tension in the Sahel region, Sub-Saharan Africa has not experienced any major political instability in recent years that would justify such capital flight. Given this paradox and in the light of the current international debate on capital flight, it is reasonable to ask what factors really explain this drain of capital from Sub-Saharan African countries?

Our study will focus on the role of banking sector regulation and supervision which, because in our view, should not be considered as a passive actor in the analysis of capital flight, given the crucial position of banks in managing countries' payment systems. Banking

sectors in Sub-Saharan Africa have grown rapidly over the past two decades, in the wake of the commodity super-cycle and the continent's strong growth. Despite this strong growth, banking sector in this region is characterized by a number of features that may facilitate capital flight. In many countries, there are regulatory and supervisory weaknesses, including consolidated supervision, lack of depositor protection schemes, capacity and enforcement and underdeveloped banking sector Bank (2022).

The purpose of our study is, to contribute empirically to the current international debate on the determinants of capital flight by going beyond factors related to macroeconomic and political instability and identifying factors related to the failure of banking sector regulation and supervision. Its therefore attempts to address the research gap by investigating the link between these variables.

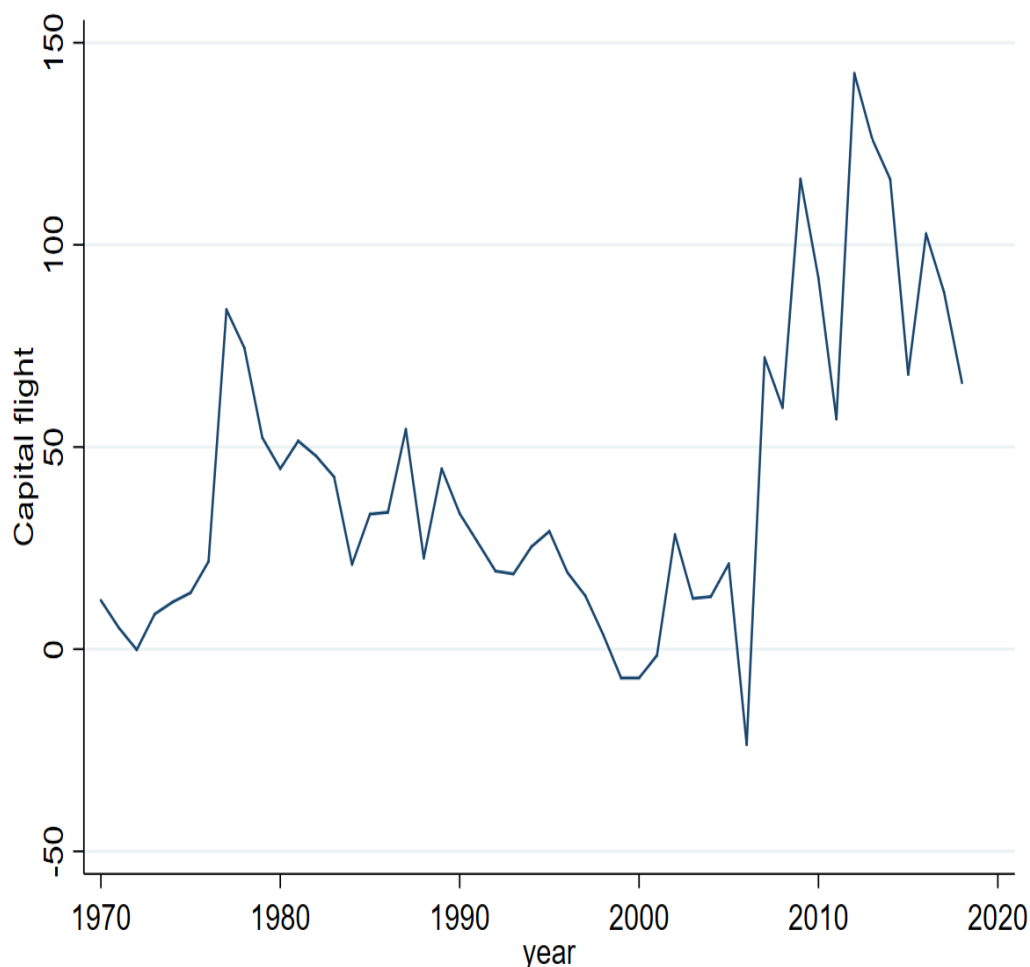
In addition to this introduction, this study is divided into four further sections. Section 2 presents an overview of capital flight trends and the links between capital flight and banking sector characteristics. Section 3 reviews the theoretical and empirical literature on the relationship between banking sector regulation and capital flight. Section 3 is devoted to empirical analysis. The final section presents a conclusion and discussion.

4.2 Capital flight in Sub-Saharan Africa: trends and stylized facts.

In this section, we provide some stylized facts on capital flight and banking regulation in Sub-Saharan African countries. Figure 1 illustrates the trend of capital flight in Sub-Saharan Africa since 1970.

The observation that we can draw is that capital flight followed an upward trend since the end of the 1990s after a period of relative stability from 1980 to the end of the 1990s.

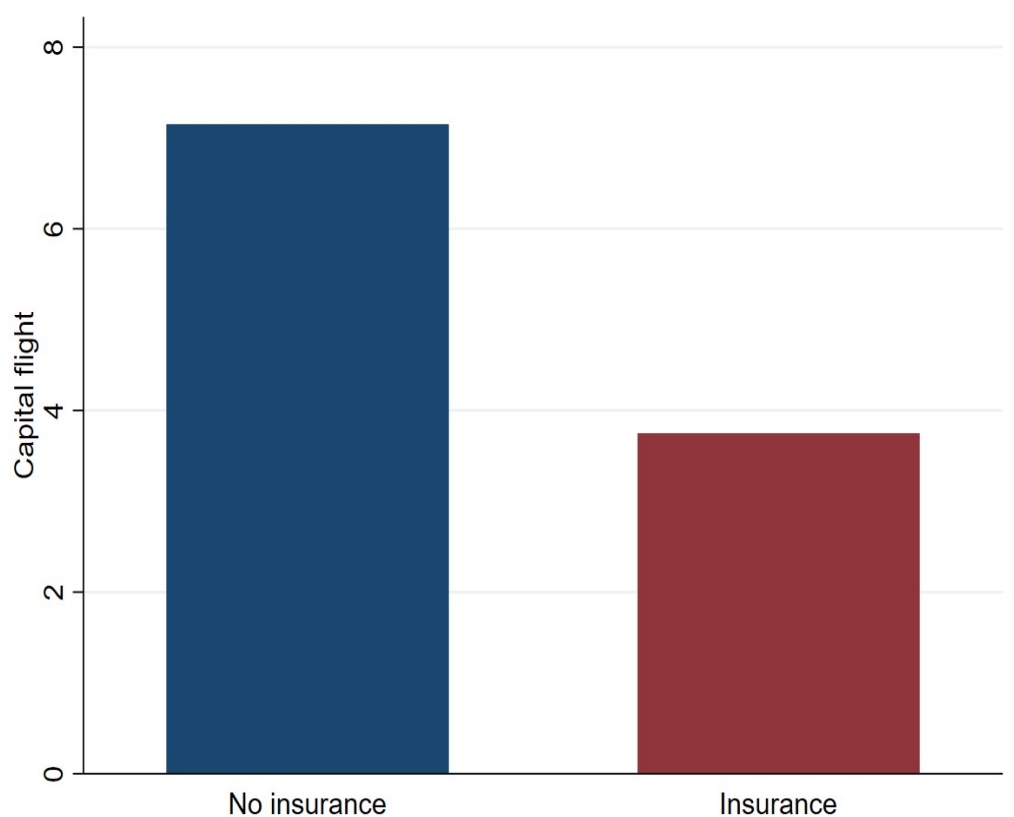
Figure 4.1 Capital flight trends in Sub-Saharan Africa (1970-2020).



Source: Ndikumana and Boyce database from World Bank data.

One explanation of this relative stability may be the various macroeconomic and institutional reforms undertaken by the countries of the region under the guidance of the World Bank and the IMF. The high level of capital flight since the end of the 1990s, despite a stable macroeconomic and institutional environment, may be explained by the strong financial liberalization that these countries have undertaken.

Figure 2 compares capital flight between countries with deposit insurance schemes and those with no insurance. Countries without bank deposit insurance systems have higher capital flight compared to countries with bank deposit insurance systems.

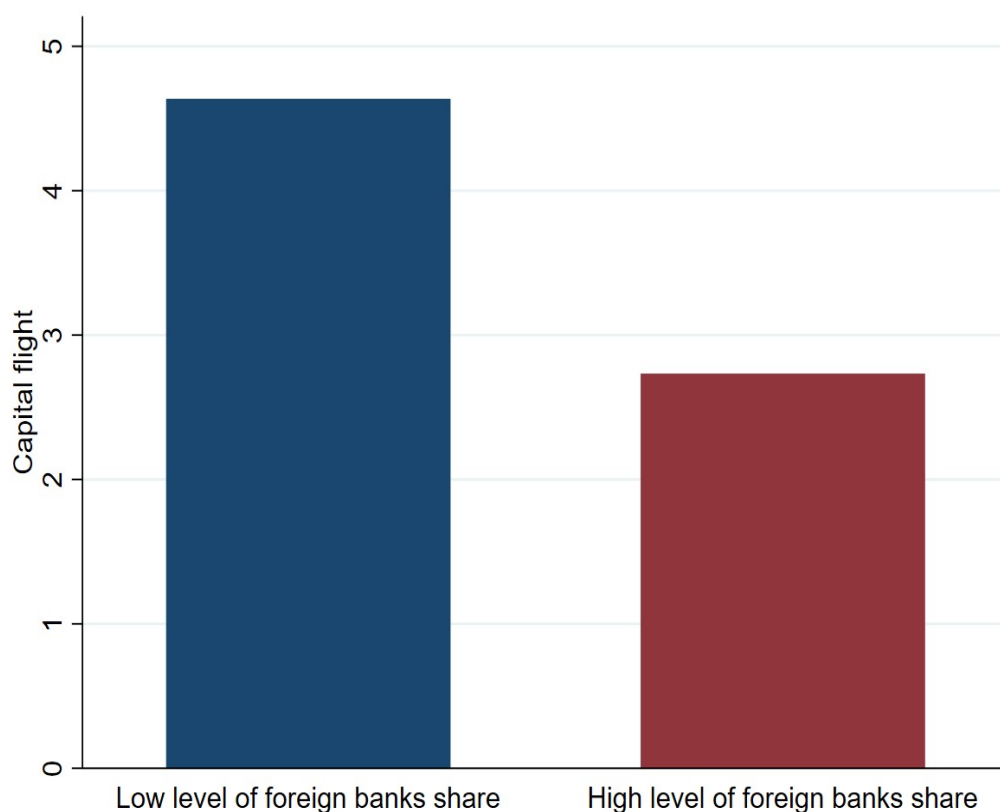
Figure 4.2 Capital flight by bank deposit insurance protection category.

Source: Ndikumana and Boyce database from World Bank data, Banking regulation and supervision data from World Bank.

Bank deposit insurance schemes are a mechanism to address the risk of bankruptcy of financial institutions receiving deposits. In practice, deposit insurance schemes guarantee deposits and thus reduce or eliminate the risk of loss for any depositors holding their funds in a financial institution. By preventing the possibility of losses to individual depositors, their incentive to withdraw deposits in advance of other depositors is limited if a deposit insurance scheme is in place Diamond and Dybvig (1983). Deposit insurance schemes prevent the spread of troubles from one bank to the whole industry. Given the integrated global nature of capital markets in today's world, a country without a deposit insurance system may face significant capital flight Barth et al. (2021); Kleimeier et al. (2019). This is due to the fact that if deposit insurance protection systems are non-existent in a given country, depositors may find it more attractive and safer to keep their assets outside the country.

Figure 3 compares capital flight between countries with a high foreign bank presence and countries with a low foreign bank presence. Foreign bank presence is perceived as a degree of banking competition in a country.

Figure 4.3 Banking competition and capital flight.



Source: Ndikumana and Boyce database from World Bank data, Banking regulation and supervision data from World Bank.

Capital flight is higher in countries with low foreign banks presence. One explanation behind this is that domestic residents generally perceive foreign banks as safer than domestic banks, as the former benefit from the external support of their home banks. Therefore, they may shift their deposits from domestic banks to foreign banks in their country instead of engaging in capital flight abroad.

4.3 Litterature review.

Portfolio choice theory Markowitz (1999) provides the conceptual analytical framework allowing to understand the motivations behind capital flight in the context of an increasingly globalised economy. The main idea behind this theory is that the assets held by agents domestically reflect a portfolio choice. The decision which amount of a particular asset to hold will be determined by both the relative attractiveness of that asset and its value. Similarly, the amount of assets held abroad will be determined by both the relative attractiveness of domestic and foreign assets and the overall wealth endowment. Therefore, when domestic agents are exposed to an environment of high risk and uncertainty, the value of financial assets held in a domestic economy may be expected to erode, leading to capital volatility and outward movement. The literature on capital flight is based on this theory. Alesina and Tabellini (1989); Bhattacharya (1999); Dooley (1988); Hermes et al. (2004); Tornell and Velasco (1992) argued that capital flight is the result of domestic investors' desire to maximise their profits by allocating their funds between the domestic and foreign markets. In developing countries, capital flight is quite pronounced due to the existence of a risky environment, which results in a net decrease in risk-adjusted returns. This may explain why capital often moves from developing to developed countries Lucas (1990).

4.3.1 Determinants of capital flight: the role of institutions.

Institutions play a fundamental role in creating a favourable climate for domestic investment in all countries. The role of institutions in countries' economic performance has been discussed in several theoretical and empirical studies. North (1986) found that well-developed institutions increase directly the potential of higher returns in domestic economies by lowering transaction costs. Acemoglu et al. (2001) argued that institutions directly influence the willingness and ability of economic agents to engage in productive investment. In the

literature, researchers have come to a consensus that capital flight is symptomatic of an environment characterised by weak institutions. Political instability, for example, can undermine a country's economic performance and lead to capital flight Gibson and Tsakalotos (1993); Le and Zak (2006); Lensink et al. (2000); Schineller (1997). In the case of political regime change, for example, there is a risk of repudiation of previous contracts with foreign companies, but also an increased risk of expropriation. In an environment where the direction of public policies is uncertain, domestic investors will be uncertain on what impact these policies will have on the real value of assets held in this country, increasing the possibility of capital flight Hermes and Lensink (2001). Empirically Sheets (1995) finds that policy uncertainty positively affected capital flight in the former communist countries of Eastern Europe that were transitioning to market economies. His study showed that the shock therapy implemented by these countries led to massive capital flight as the policy reforms initially generated higher uncertainty. In Russia after the political instability in 1998, the country experienced the largest amount of capital flight among all transition economies Loungani and Mauro (2000). Makoche Kanwa (2007) shows that the uncertainty associated with political instability in Zimbabwe following land reforms contributed strongly to stimulating capital flight in this country.

In the literature, there is also a consensus on the role of corruption facilitating capital flight. Empirically, Cerra et al. (2008) examined, through a panel approach, the role of corruption in capital flight in developing countries. Their study finds a positive and significant effect of corruption on capital flight. In the same logic and through a dynamic panel analysis on the determinants of capital flight in the common market of Eastern and Southern African member countries, Collier et al. (2004) found a positive and statistically significant effect of corruption on capital flight. Other studies by Lawanson (2006); Ndiaye (2009) have also found a positive relationship between corruption and capital flight in developing countries. Baek and Yang (2008); Ndikumana (2006, 2014) examined the determinants of capital flight using panel data

for 53 developing and 23 developed countries over the period 1984-2004. Their empirical results showed that corruption and capital flight were positively and significantly related.

4.3.2 Determinants of capital flight: the role of macroeconomic environment.

Macroeconomic factors like exchange rate fluctuations, inflation, fiscal deficit, financial development, economic growth, current account position have been identified as factors influencing capital flight. An overvalued exchange rate is often considered as a major determinant of capital flight as the degree of currency overvaluation is an indicator influencing the rate of return for domestic and foreign investors. An overvalued exchange rate leads to higher expectations of depreciation in the near future. So to avoid future wealth losses, residents will be motivated to transfer at least part of their assets abroad. The empirical evidence on the effects of exchange rate misalignments on capital flight is however mixed. While Al-basheer et al. (2016); Aziz et al. (2014); Forson et al. (2017); Hermes and Lensink (2001) found a positive link between the real effective exchange rate and capital flight, other studies, Lensink et al. (1998); Ng'eno (2000) found no statistical relationship between the two variables. High inflation directly erodes real value of domestic assets, leading residents to hold assets outside the country. High inflation leads domestic asset holders to respond to the real value erosion of their assets by transferring their assets abroad. Moreover, as inflation is often seen as an indicator of the government's overall ability to manage the economy, its rise tends to undermine such ability and create an uncertain environment that encourages capital flight. Empirically, Dooley (1988); Lensink et al. (2000); Liew et al. (2016) have found that uncertainty related to inflation has a positive effect on capital flight. Ndikumana and Boyce (2003); Nyoni (2000) find that the relationship was not statistically significant. Fiscal deficits, as a source of public sector debt, may encourage capital flight. It raises domestic economic agents' expectations of future tax increases to satisfy public debt repayment obligations,

leading to capital flight. Empirically, Auzairy and Sopian (2017) found a positive relationship between fiscal deficit and capital flight for Malaysia. Uddin et al. (2017) found a positive relationship between fiscal deficit and capital flight for Bangladesh from 1973 to 2013. Ndikumana and Boyce (2003) found a positive correlation between budget deficits and capital flight in 30 African countries. High GDP growth rates reflect the presence of domestic investment opportunities, which encourage economic agents to undertake more investment, leading to reduced capital flight from the country. Auzairy and Sopian (2017); Tornell and Velasco (1992) find that, in an economy characterised by capital account openness, the rate of economic growth and the magnitude of capital flight are negatively related. Ajayi (1995), in his study on the determinants of capital flight in Nigeria, found that low economic growth leads to capital flight. Ndikumana (2006) found a negative relationship between growth rate and capital flight from Sub-Saharan African countries. The market theory of financial markets predicts that capital will flow to countries with a developed financial system and which offer higher investment returns. Consequently, low levels of financial development and higher real interest rate differentials between countries may contribute to capital flight. With relatively low rates of return on domestic investments, investors are more likely to transfer their capital to countries offering higher returns Auzairy and Sopian (2017); Deppler and Williamson (1987).

4.3.3 Banking system and capital flight.

Banks and financial institutions can play an important role in capital flight. However, systematic studies on the involvement of the banking sector in facilitating capital flight from developing countries are limited. The existing literature identifies the following factors as being important: the existence of high banking secrecy, the absence of comprehensive or credible deposit insurance, weak banking regulation and supervision, a strong presence of foreign banks, weak central bank independence, capital controls.

The existence of a comprehensive or credible deposit insurance system for assets held in the domestic banking sector is recognised as one of the characteristics of a domestic financial system that discourages capital flight. The reason is that if deposit insurance protection systems in a given country do not exist, weakly credible or highly ineffective, depositors may be motivated to move to more attractive and safer countries rather than deposit their money in domestic banks. Empirically, Ajayi (1995); Allen et al. (2010) find a positive relationship between a weak deposit protection system and capital flight in developing countries. Similarly, an underdeveloped banking sector in a given country can lead to capital flight. If the level of banking sector development provides only a limited variety of financial instruments for holding assets, local agents may be expected to seek other countries where their assets will be better remunerated. Data on capital flight in developing countries reported by Mu et al. (2013); Ndikumana (2014) confirm this hypothesis. Bank secrecy, the principle by which banks are not allowed to reveal the existence of an account or disclose account information about their clients, is one of the features of a financial system that is most likely to encourage the flight of legally or illegally acquired funds. It restricts access to bank information by national and international authorities. Under high bank secrecy, the incentives for banks to undertake reasonable controls on their customers are low. They will have an incentive to help wealthy clients to manage their assets secretly. Heggstad and Fjeldstad (2010); Palmer and Cerruti (2009); ? have shown that high-ranking politicians in several countries have been helped by banks to transfer large amounts of public money out of their countries. In some countries, secrecy jurisdictions are sources of tax evasion, money laundering and terrorist financing. In the report *"The morning after the night before. The impact of the financial crisis on developing countries"*, Aid (2009) explains how the lack of transparency in financial centres and bank secrecy have contributed to create turbulence in the global financial market by facilitating capital flight. Previous publications have also

highlighted the harmful effects of bank secrecy Owens and Saint-Amans (2009); Witness (2009).

In the literature, it has been stated that the lack of adequate regulatory and supervisory frameworks for banks may encourage capital flight. Banks are acting for profit, their operations are not always in the interest of the banking system or society in general. They may therefore be willing to take risks and facilitate capital flight if they are weakly regulated. Regulation and supervision of banks is therefore extremely important to ensure the stability of banking system in the context of overall economic stability, which is necessary to limit the occurrence of financial crises that cause capital flight Ndikumana (2014). Good regulation and supervision ensures the safety of depositors, through various channels such as transparency of banking operations via reporting and recording requirements, but also the safety of the banks themselves, through prudent lending and capital controls. In several countries, the central bank is the body responsible for supervising commercial banks for prudential reasons and for preventing capital flight. The lack of independence of central banks from political powers can therefore weaken their authority and their ability to prevent capital flight. In the worst case, the central bank may even play an active role in facilitating capital flight Massa (2014).

A significant presence of foreign banks in a country is likely to encourage capital flight. In developing countries the financial systems of many countries are dominated by foreign bank branches, which have grown considerably over the past decades. Foreign banks acquired a significant market share when local banking systems were restructured and state-owned banks were privatised. Roldós and J. (2001), shows that the presence of foreign banks leads to what has been defined as "internal capital flight". This means that local residents generally perceive foreign bank branches as safer than domestic banks, as the former benefit from the external support of their mother banks. They can therefore transfer their deposits from domestic to foreign banks in case of a crisis Massa (2014). In this way, they facilitate capital

flight. Branches or subsidiaries of foreign banks can also facilitate the transfer of illegally acquired local funds abroad.

4.4 Data

The data used in this study are collected from the Bank Regulation and Supervision Survey² of the World Bank (a data on how banks are regulated and supervised around the world), the Global Financial Development data of World Bank, the World Development Indicators (WDI) database of the World Bank, Léonce Ndikumana and James K. Boyce database on capital flight on African countries (based on World Bank data), Milesi-Ferretti database on the external wealth of nations, the United Nations Conference on Trade and Development (UNCTAD), the Investment capital stock database of the International Monetary Fund (IMF). Additional sources for the database are from Policy IV and ICRG. A major effort has been made to construct a panel for the 21 African countries covering the period 2000-2017. Two fundamental reasons motivated the choice of the 2000-2017 period. First, it corresponds to the post-liberalisation period, which was strongly marked by the removal of restrictions on banking activities and capital flows imposed by Sub-Saharan African governments. Secondly, it is due to the constraint of banking data: the Bank of Regulation and Supervision Survey of the World Bank is in fact built on the basis of the World Bank's survey of banks that began in 2000.

4.4.1 Measurement of capital flight.

Capital flight statistics are not readily available, and must be constructed. Since there is no universal definition of capital flight, the literature proposes several different approaches to measure it. We use the measure developed by Ndikumana and Boyce (2018), based on

²A data set on how banks are regulated and supervised around the world

the World Bank's residual method. This approach calculates capital flight as the residual difference between registered capital inflows and outflows of foreign exchange. It uses balance of payments statistics to indirectly measures capital flight by comparing the sources of capital entering the country, on the one hand (i.e. net increases in external debt and net inflows of foreign direct investment), and the uses of finance, on the other hand (i.e. current account deficit, official foreign reserve accumulation, private capital outflows). If the sources from the World Bank debt data exceed the uses of capital inflows, this difference is often referred to as capital flight.

$$CF_{it} = \Delta EXD_{it} + FDI_{it} + PI_{it} + OI_{it} - (CA_{it} + \Delta FR_{it}) + MISINV_{it} \quad (4.1)$$

Where CF_{it} denotes capital flight, ΔEXD_{it} external debt, FDI_{it} foreign direct investment, CA_{it} current account surplus and ΔFR_{it} , PI_{it} is portfolio investment, OI_{it} is other investments change in foreign reserves, $MISINV_{it}$ is net trade misinvoicing.

$$MISINV_{it} = \frac{DXIC_{it}}{ICXS_{it}} + \frac{DMIC_{it}}{ICMS_{it}} \quad (4.2)$$

Where ICXS represents IC's share in the sum of country's exports to advanced economies and exports to emerging and developing countries. ICMS is IC's share in the sum of country's imports from advanced economies and imports to emerging and developing countries.

Export misinvoicing:

$$DXIC_{it} = MIC_{it} - cif * (X_{i,IC,t} + X_{i,IC,t}^U) \quad (4.3)$$

Import misinvoicing:

$$DMIC_{it} = (M_{i,IC,t} + M_{i,IC,t}^U) - cif * (X_{IC,it} + X_{i,IC,t}) \quad (4.4)$$

The terms $X_{i,IC,t}^U$ and $M_{i,IC,t}^U$ represent the amounts of exports and imports recorded under ‘unspecified areas’ that are allocated to ICs based on the latter’s shares in the African country’s total exports and imports.

4.4.2 Banking environment variables.

There are a variety of instruments developed by the Basel Committee that regulatory authorities can use to regulate banks. These instruments range from restrictions on asset holding and activities, separation of traditional banking from other financial services sectors, limits on competition, capital requirements, imposition of a risk-based deposit insurance premium and disclosure requirements, licensing of banks and examination of banks. The imposition of a capital requirement is one of the most common forms of regulation. It usually takes the form of a capital adequacy ratio. The restriction aims to ensure that banks hold enough capital to remain solvent at all times, i.e. to withstand unexpected shocks. In this chapter, we use three indicators that allow us to measure banking regulation and supervision: the z-score (banking system insolvency index), the availability of a deposit protection insurance scheme, the banking competition regulation (the banking concentration index, and the share of foreign banks in domestic banking assets).

The z-score has been widely used in the empirical banking literature to measure the risk of bank insolvency, based on the experience of the 2007-2008 financial crisis in the US and Europe. The attractiveness of this index is based on its close link with the probability of bank insolvency, i.e. the probability that the value of their assets is insufficient to cover losses Laeven and Levine (2007); Schaeck et al. (2006). It is one of the indicators used by the World Bank to measure the effect of banking regulation on the soundness of banking institutions in each country. The widespread use of Z-scores can be explained by their relative simplicity and the fact that they require only accounting information for their calculation. For our study, its use is appropriate for two reasons. First, it allows us to take into account the importance

of the constraints of banking regulation on regulatory capital faced by banks. Second, it allows us to take the return on invested capital under the constraints of the banking regulation in force in the country. In terms of interpretation, a high value of the z-score means that the quality of banking regulation is high and the risk of failure of the banking system is expected to be quite low. Conversely, a low z-score value is an indication of low regulatory quality and a high probability of default of the banking system. Our hypothesis is that good regulation reduces the risk of bank failure and increases the confidence of domestic agents in the banking system, thereby keeping their capital in place. It is taken from the World Bank's Banking Regulation and Supervision database.

The z-score is presented in the following form:

$$Z - score = \frac{CAR + \mu_{ROA}}{\sigma_{ROA}} \quad (4.5)$$

CAR the banking capital-asset ratio and ROA its return on assets.

$$P(ROA \leq -CAR) \leq (1 + Z^2)^{-1} < 1$$

μ_{ROA} is a mean of ROA and σ_{ROA} its standard deviation. In this sense, a high z-score can thus be argued to correspond to a low probability of insolvency associated to good regulation.

In the equation CAR represents capital requirement which is a tool used by banking authorities to regulate the banking system. It usually takes the form of an amount of capital that banks must hold in relation to total (risk-weighted) assets. In the absence of minimum regulatory requirements for capital adequacy, banks may have an incentive to maintain socially inadequate capital ratios. This can threaten the stability of the financial system and lead to capital flight Massa (2014). One of the main reasons why banks fail to raise sufficient capital is the presence of negative externalities when a bank fails Calomiris and Haber (2015). Bank failure entails significant private and social costs in the form of credit supply contraction and loss of economic output, which are not internalised by bank managers

or shareholders. A second reason why banks may not hold sufficient capital stems from the presence of safety nets such as deposit insurance and bailouts. Safety nets protect depositors, but they also indirectly subsidise bank risk-taking, as depositors no longer need to monitor or discipline banks. To the extent that other uninsured creditors are protected, supervision is even weaker. Thus, safety nets weaken the market's role in encouraging banks to maintain adequate capital Calomiris and Haber (2015).

Deposit insurance is an important regulatory tool in modern banking systems. Its main function is to insure unsuspecting depositors against the risk of bankruptcy and massive capital flight from a country. As a result, it greatly reduces the possibility of massive withdrawals in the event of problems in the banking system Diamond and Dybvig (1983). The imposition of risk-based deposit insurance premiums ensures that banks assess risk correctly by limiting the possibility of a banking crisis while increasing the confidence of domestic agents in the banking system that keeps their capital in place. In the presence of deposit insurance, banks are more likely to engage in risky activities Allen et al. (2010); Diamond and Dybvig (2008), which may increase the possibility of a banking crisis and lead to capital flight. We have extracted it from the Banking regulation and survey database of the World Bank.

Restriction of competition aims to prevent banks from taking more risks that threaten the stability of the banking system. When the level of competition is intense, banks may engage in excessive risky behavior in order to maintain their profits. This can cause a crisis and generate instability in the financial system and a loss of confidence of domestic agents in the banking system. Limitations of competition can take many forms, including, but not limited to, barriers to entry of foreign banks into the domestic banking system, limits on the total number of banks in a given region, etc., and restrictions on the number of branch openings. We use two indices to measure the degree of banking competition regulation. The

bank concentration index, and the share of foreign banks in domestic banking assets. We extracted them from the World Bank's Global Financial Development database.

4.4.3 Macroeconomic and institutional environment variables.

Our control variables are: inflation, debt, financial development, bank profitability, foreign direct investment inflows, domestic investment and domestic savings, economic growth, political stability.

Inflation is a variable that allows us to measure macroeconomic stability. High inflation directly erodes the real value of domestic assets, encouraging residents to hold assets outside the country. Capital tends to flee abroad as the government depends on taxing domestic financial assets through money creation. A low level of financial development and higher real interest rate differentials between countries can contribute to capital flight. Faced with relatively low rates of return on domestic investments, investors are more likely to send their capital abroad to countries offering higher returns. We use the share of private sector credit to GDP as an indicator of financial sector development. In an environment of high external debt, residents are motivated to move their resources out of the country to foreign countries. The debt thesis, also known as the debt overhang thesis, states that capital flight reduces the incentive to save and invest. The assumption is that with a large foreign debt, devaluation of the exchange rate, a fiscal crisis, lower productivity, crowding out of domestic capital and expropriation of assets to pay the debt are expected. Foreign direct investment inflows can influence capital flight. Its impact, however, can be ambiguous. An increase in FDI inflows provides more resources, which may lead to greater capital flight Ajayi (1995). FDI can also be detrimental to the investment climate of recipient countries, encouraging corruption and rent-seeking Gani (2007). On the other hand, FDI can reduce capital flight through its beneficial effect on the domestic investment climate Kant (1996); Lensink et al. (2000). Capital flight is often associated with low levels of domestic investment and domestic

savings Ndiaye (2009); Ndikumana (2006). High rates of domestic investment and savings are interpreted as reflecting the existence of a better investment environment and a favorable tax climate in a country, thus providing incentives for domestic agents to keep capital in place to earn higher returns, protect their investments from instability, diversify their assets, or to benefit from privacy.

As an institutional variable, we use political stability and country investment environment quality index. Lack of confidence in a country's political system, coupled with weak governance institutions, can lead to capital flight. Political instability often leads to macroeconomic instability, including economic mismanagement, rent-seeking economic activities, and the illicit misuse of public funds. These factors, combined with weak institutions to protect property rights, ongoing political unrest, and a general sense of insecurity, can lead to capital flight.

The following table summarizes all the variables with their sources.

Table 4.1 Summary of varibales.

Variables	Sources	Expected sign
Capital flight (CAF)	Ndikumana and Boyce database	
Portfolio investment outflows (POR)	Milesi-Ferretti database	
FDI outflows (FDO)	Milesi-Ferretti database	
DEBT outflows (DTO)	Milesi-Ferretti database	
Banking regulationg (BRE)	World Bank	-
Banking concentration (BCC)	World Bank	+/-
Banking profitabilty (BPF)	World Bank	+/-
Banking non interest income (BNI)	World Bank	+/-
Foreign bank (FRB)	World Bank	+/-
Bank deposit insurance (BDI)	World Bank	-
Debt (DEB)	World Bank	+
Financial developement (FIN)	World Bank	+/-
Inflation (INF)	World Bank	+/-
Foreign Direct Investment (FDI)	UNCTAD	+/-
Domestic private investmen ((PRI)	IMF	+
Domestic Saving (SAV)	World Bank	-
Political stability (POS)	Policy IV	+
Quality of investment environment	ICRG	-
Growth (GROW)	World Bank	+/-

Source: see above and complication by the authors.

Table 4.2 Descriptives statistics.

VARIABLES	N	mean	sd	min	max
CAF	378	4.881	14.39	-71.03	135.7
BRE	319	11.38	5.944	2.548	41.31
BCC	319	85.41	13.79	33.42	100
FRB	225	50.41	29.73	0	100
BDI	378	0.667	0.472	0	1
BNI	318	7.188	2.929	0.0687	15.428
BNI	297	5.524	3.907	0.211	20.098
DEB	378	35.45	21.54	3.684	128.0
FIN	297	27.20	43.80	1.095	257.2
INF	323	13.16	43.48	-72.73	550
FDI	342	31.24	33.79	0.561	299.2
PRI	342	12.11	6.832	0.424	33.37
SAV	243	16.81	11.54	-16.94	46.14
POS	266	0.722	1.577	0	7
INS	341	7.240	1.999	1	11.5
GROW	266	4.821	3.883	-12.67	26.42
POR	377	2.711	8.028	-0.007	49.643
FDO	377	2.956	7.438	-0.0030	78.122
DTO	377	12.929	12.323	1.509	106.607

Source: authors calculation from database.

4.5 Empirical methodology

In this section, we describe the model used to estimate the effect of bank regulation on capital flight. To specify our model, we draw on theoretical and empirical results on the factors that affect capital flight. We perform the regressions by adopting FGLS (Feasible Generalized Least Squares) and three alternative estimators: SUR (seemingly unrelated regression system), RE-GLS (Random Effects Generalized Least Squares) and GMM (Generalized Method of

Moments). The choice of these empirical strategy is motivated by at least three fundamental reasons.

Firstly, FGLS and RE-GLS will allow to account for heteroscedasticity, cross-sectional and serial correlations which are important problems in the error terms of panel regression models Newey and West (1987); White (1980). Two main reasons motivate the use of SUR. The first is to gain efficiency in estimation by combining information on different equations. In our case, this model will enable us to estimate the effect of banking regulation on several alternative indicators of capital flight by specifying several equations. The second motivation is that this estimator allows us to test restrictions that involve parameters in different equations according to Zellner (1962), since the seemingly unrelated regression system (SUR) comprises several individual relationships linked by the fact that their perturbations are correlated. The choice of GMM is justified by the fact that, on the one hand, capital flight can be a dynamic process. Indeed, the current level of capital flight can be explained by the level reached in the previous period, considering, for example, the inertia of agents' behavior. On the other hand, some explanatory variables may be endogenous. The use of GMM can also provide solutions to the problems of simultaneity bias, reverse causality and omitted variables. In our case, these problems can potentially be present since capital flight and banking regulation can influence each other in reciprocal ways.

We specify the model as follows:

$$CF_{i,t} = \beta_0 + \beta_1 BRE_{it} + \beta_2 INF_{it} + \beta_3 DEB_{it} + \beta_4 FDI_{it} + \beta_5 FIN_{it} + \beta_6 PRI_{it} + \beta_7 SAV_{it} + \beta_8 POS_{it} + \beta_9 GROW_{it} + \beta_{10} FRE_{it} + \zeta_{i,t}. (4.6)$$

with,

- CAF_{it} capital flight,
- BRE_{it} banking regulation index,
- FIN_{it} financial development,
- FDI_{it} foreign direct investment,
- INF_{it} inflation,
- PRI_{it} private investment,
- SAV_{it} domestic saving,
- FRE_{it} foreign banking share,
- BPF_{it} Banking profitability,
- BNI_{it} bank non interest income,
- $GROW_{it}$ growth,

4.6 Empirical results

This section presents estimation results our results. Firstly, our results confirm the empirical finding on the role of institutional environment quality as determinants of capital flight in developing countries. country investment environment quality is statistically significant and negatively related to capital flight (table 3 column 1 Annex 3). The reason behind this finding is that bad institutional environment is perceived as bad in any economy. It has an impact on the risks and uncertainties of the economic and political environment. Specifically, residents may decide to keep their assets abroad because of a lack of confidence in domestic political environment. This is consistent with portfolio choice theory, which suggests that capital flight is driven by the relative risk-adjusted expected return. A number of empirical studies

have provided considerable support to the hypothesis that bad institutions increase risk and encourage capital flight in developing countries. For example, Khan and Haque (1985) have shown that, because of bad institutions, the risks perceived by investors in developing countries are higher than those perceived in developed countries, due in particular to the risk of expropriation. This risk reflects the weak institutional and legal protection of private property in developing countries. Given this risk of expropriation, domestic residents prefer to hold their assets abroad, where they benefit from a more secure rate of return, and borrow external funds to finance domestic investment. Thanks to this strategy, capital flight increases as domestic agents reduce the vulnerability of their portfolios to taxation or expropriation Eaton (1987).

Turning to our variable of interest, we find a significant negative relationship between banking regulation and capital flight (table 3, columns 1 to 5 Annex 3). Thus, an improvement in the quality of banking regulation reduces capital flight. We explain this relationship by the fact that improving the quality of banking regulation by imposing constraints on bank funds for example strengthens the soundness of banking system. As a result, agents have more confidence in domestic banks. Furthermore, by comparing countries without deposit protection insurance systems (table 4, column 2) with those having deposit protection insurance (table 4, column 3 Annex 3), we find that the effect of regulation is much more pronounced for countries without a bank deposit protection insurance scheme. We can explain this result by the fact that extending insurance coverage to bank deposits helps to boost confidence in the banking sector by reducing the possibility of massive withdrawals in the event of problems in the sector. Deposit protection insurance is an important element in the regulation of modern banking systems. Its main function is to insure unsuspecting depositors against the risk of bankruptcy and massive capital flight from a country Boyd and De Nicolo (2005); Diamond and Dybvig (2008).

The Mexican financial crisis of 1982, the South-East Asian crisis of 1997, the global crisis of 2008 and the eurozone crisis of 2011 all highlighted the risk that a weakened banking system represents for capital flight. These crises have shown that weak regulation combined with banking fragility severely erodes the confidence of domestic agents in the financial system, leading to massive capital flight towards abroad.

The regulation and supervision of banks in Sub-Saharan African countries has been the subject of many discussions in recent years, largely as a result of the 2008 global financial crisis. A number of studies have highlighted weaknesses in regulation and supervision as a key factor in their fragility, particularly given their exposure to commodity prices. In some countries, regulatory and supervisory authorities are often subject to political interference and are therefore less effective and impartial, according to World Bank reports. The level of independence of central banks, which are often the supervisory body for the banking system, is low. In addition, according to World Bank banking regulations and supervision, auditors are not required to have a minimum level of experience in bank auditing. Financial disclosure is incomplete in several Sub-Saharan African countries: banks are not required to make their annual consolidated financial statements available to the public. Information on off-balance sheet items, governance, risk management frameworks and capital adequacy ratios is also not publicly available in several countries. These weaknesses are a source of loss of confidence in the banking systems of these countries. Consequently, improving the quality of banking regulation and supervision enhances the stability of the banking system, while strengthening the confidence of domestic agents in keeping their capital in the banking system.

In our study we paid particular attention to the share of foreign banks in domestic banking assets. In the literature, foreign banks' share of domestic banking assets is considered as an indicator of banking competition regulation. A high share of foreign banks in a country's banking assets is a reflection of a banking regulation that promotes competition. We find a negative and statistically significant relationship between the increase in the share of foreign

bank assets and capital flight (table 3 columns 3 to 4 Annex 3.). This means that the presence of foreign banks limits capital flight in these countries. We can explain this result by the fact that foreign bank subsidiaries are generally more innovative and considered to be safer than domestic banks, as foreign banks benefit from the external support of their home banks Gelos and Roldos (2004). Their presence in a country can be perceived by domestic agents as a signal of banking system stability. One explanation may also be that foreign banks generally have more investment opportunities as they are more developed and innovative. They can therefore easily allocate local resources to better investment opportunities that limit capital flight. The financial systems of many Sub-Saharan African countries are dominated by branches or subsidiaries of foreign banks . Such branches have enhanced considerably over the past decades, as foreign banks gained a significant market share when local banking systems were restructured and national banks were privatised through several reforms in the 1990s.

Since in the literature some authors define capital flight as the normal outflow of capital, we have used the normal outflow indicators as alternative indicators and proxies for our capital flight indicator. These normal capital outflow indicators have been developed by Milesi-Ferretti to measure the external wealth of countries. These indicators are portfolio investment outflows, foreign direct investment outflows and debt outflows. The results are presented in the table 5 Annex 3 in column (2) for the effect of banking regulation on portfolio investment asset outflows, (3) the effect of banking regulation on foreign direct investment outflows and (4) the effect of banking regulation on debt asset outflows. Our coefficients are always negative and significant, confirming our previous results on the disincentive effect of the quality of banking regulation on capital flight.

4.6.1 Robustness

The degree to which banks are able to finance the economy depends critically on the degree of competition in the banking system. The more competitive the banking system is, the more viable projects banks can finance. But more competition can also lead to excessive risk-taking by banks. We use bank concentration as a proxy for the regulation of bank competition. We find a positive and significant relationship between bank concentration and capital flight in table 6 columns 1 to 4 Annex 3. In the context of Sub-Saharan Africa, we can explain this result by the fact that when banking systems are highly concentrated on a small number of banks, there are few opportunities for domestic agents to diversify their assets. This can be a source of capital flight, as domestic agents will seek to diversify their assets by investing them in other countries. In many Sub-Saharan African countries, banking concentration is very high (in our sample, the average banking assets held by the 5 largest banks is 85.41%, reflecting the high degree of banking concentration in these countries). We also explain this result by the fact that in a concentrated banking system, banks tend to take more risk which might affect the stability of the banking system as a whole Boyd and De Nicolo (2005); Diamond and Dybvig (2008). The regulation of banking competition is therefore a factor that can affect capital flight through its influence on banking stability by affecting the confidence of domestic agents. In fact, if higher banking concentration may bring benefits in terms of stability, mostly through diversification, cost reduction and productivity gains, it is also associated with less competition that may lead to riskier asset portfolios that threaten financial stability and encourage capital flight. In a concentrated environment, increased risk on the balance sheet of banks may be related to higher risk on the borrowers' side, facing higher interest rates in a less competitive market, or to less selective credit control, as dominant banks have less incentive to rationalise lending given the associated supervisory costs. As a consequence, banks are more exposed to aggregate risk, ultimately weakening their balance sheets and increasing their probability of default. Furthermore, when banking systems are

concentrated on too few groups, they can become so large and complex that their disorderly failures would cause other failures to spill over and sustainably damage the financial system. In terms of competition regulation, the banking sector in Sub-Saharan Africa has experienced changes over the past two decades. During the 1980s, the banking sector was dominated by state-owned banks. In recent years, financial liberalisation, institutional modernisation and regulation, and globalisation have changed the face of financial systems throughout the region. Despite these profound changes, problems of concentration, limited competition and high costs persist and are a source of vulnerability of banking systems Beck and Cull (2014).

Finally, we conducted another robustness test using alternative econometric methods. Firstly we have use Seemingly Unrelated Regression (SUR) using our main dependant variable, capital flight and others alternative variables from Milesi-Ferretti database, portfolio investment asset outflows, foreign direct investment outflows, debt outflows. In table 7 Annex 3, columns (1) and (2) present results respectively for capital flight and alternative portfolio investment asset outflows, columns (3) and (4) for capital flight and alternative foreign direct investment outflows, columns (5) and (5) for capital flight and debt outflows. Secondly we use RE-GLS etimator and GMM. Table 8 Annex 3 present the results. columns (1) to (3) present the results with RE-GLS respectively for ours variable of interest and two alternative variable of banking concentration. columns (4) present the result with GMM. For GMM The autocorrelation test is performed using the Arellano-Bond test for autocorrelation of first difference errors. The test fails to reject the null hypothesis of no autocorrelation in the second order AR (2) for all regressions indicating that the error terms are not correlated with each other. For this condition of no autocorrelation, the use of GMM estimation is satisfied. Our results are robust to these specifications.

Finally, we conducted another robustness test by excluding outliers countries in terms of capital flight from our sample. These countries are Malawi and Sierra Leone. Table 9 Annex

3 columns (2), (4) and (6) present respectively the result for the variable of interest and two banking concentration index. Our results are still robust to these exclusion.

4.7 Conclusion

The purpose of this paper was to investigate the relationship between banking regulation and supervision and financial flight in Sub-Saharan African economies. The aim was to understand whether well regulated and supervised banking environments contribute to the reduction of capital flight. To this end, we used We perform FGLS (Feasible Generalized Least Squares) and three alternative estimators: SUR (seemingly unrelated regression system), RE-GLS (Random Effects Generalized Least Squares) and GMM (Generalized Method of Moments) applied to a panel of 21 Sub-Saharan African countries over a period of 17 years. Results reveal that banking regulation and supervision have a negative effect on capital flight in Sub-Saharan African countries. In other words, the quality of banking regulation and supervision contributes to a reduction in capital flight. More specifically, we find that regulation of capital adequacy (through improving the soundness of banks), regulation of banking competition (reduction of bank concentration, increasing foreign banks entry), have a negative impact on capital flight. The effect of banking regulation and supervision on reducing capital flight is particularly large in countries without bank deposit insurance schemes. In light of the above findings, policy recommendations to improve the quality of banking regulation and supervision to ensure the stability of the banking and financial system and to improve its impact on reducing capital flight can be made. The establishment of rigorous supervision of the banking system through the promotion of restrictive asset holding and activity policies that prevent banks from engaging in excessive risk-taking is important. In order to achieve this goal, banks should be required to meet capital adequacy requirements (as part of the implementation of the Basel III regulations), which aim to ensure that banks hold sufficient capital to remain solvent at all times, i.e. to withstand unexpected

shocks. It is necessary to work on strengthening the soundness of the national banking system, developing well-regulated local financial markets while offering adequate protection to depositors. This is especially crucial in the current context where Sub-Saharan African countries are experiencing financial innovation through improvements in financial inclusion linked to the emergence of new financial processes and products such as mobile banking and credit derivatives. Policies that limit the degree of competition are also required for these countries as banking concentration encourages capital flight. However, it is important to ensure that improving the level of competition does not encourage banks to engage in excessive risk-taking behaviour in order to maintain their profits. The implementation of these policies requires independent supervisory agencies, sufficiently qualified staff and a high level of governance to ensure supervision. These policies need to be accompanied by institutional and macroeconomic reforms that promote political and macroeconomic stability and minimize capital flight. It involves the promotion of prudent and anti-inflationary monetary policies that, among other things, limit the uncertainties associated with high prices that can lead to excessively high real interest rates and create defaults and instability in bank credit markets.

4.8 Annex 3.

Table 4.3 Base line estimation results with FGLS.

VARIABLES	(1)	(2)	(3)	(4)	(5)
Banking regulation	-0.522*** (0.177)	-0.354* (0.206)	-0.472** (0.230)	-0.489** (0.232)	-0.447* (0.235)
Inflation	-0.00520 (0.0249)	-0.00954 (0.0392)	-0.0103 (0.0422)	-0.0102 (0.0423)	-0.00689 (0.0429)
Financial development	0.0221 (0.0245)	0.0168 (0.0293)	-0.0215 (0.0317)	-0.0179 (0.0351)	-0.0251 (0.0347)
Debt	-0.116** (0.0519)	-0.0660 (0.0568)	0.0389 (0.0540)	0.0381 (0.0532)	0.0390 (0.0526)
FDI	1.128 (1.218)	1.456 (1.119)	1.599 (1.092)	1.568 (1.112)	1.897* (1.140)
Saving	-0.0850 (0.0869)	0.0200 (0.0949)	0.0175 (0.0953)	0.0145 (0.0962)	0.0181 (0.0963)
Private investment	0.334** (0.168)	0.163 (0.186)	0.284 (0.206)	0.274 (0.213)	0.149 (0.224)
Growth	-0.278 (0.185)	-0.214 (0.206)	-0.104 (0.190)	-0.100 (0.193)	-0.146 (0.194)
Political stability	-0.313 (0.633)	-0.349 (0.735)	-0.941 (0.668)	-0.920 (0.708)	-0.952 (0.702)
Institutional quality	-1.379** (0.658)	-0.698 (0.731)	-0.0798 (0.686)	-0.131 (0.690)	0.356 (0.730)
Bank non interest income	0.617*** (0.199)	0.568*** (0.208)	0.0723 (0.221)	0.0754 (0.221)	0.177 (0.230)
Foreign banks			-0.0829** (0.0370)	-0.0823** (0.0367)	-0.0846** (0.0368)
Banking marging				0.0627 (0.291)	-0.0776 (0.305)
Population					1.158 (0.769)
Constant	18.51** (7.703)	13.74 (9.677)	16.74* (10.04)	16.85 (10.38)	11.69 (10.70)
Country FE	YES	YES	YES	YES	YES
Year FE	NO	YES	NO	YES	YES

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

Table 4.4 Regression comparing countries with deposit protection insurance and countries with no deposit protection insurance.

VARIABLES	(1)	(2)	(3)
Banking regulation	-0.447* (0.235)	-9.128** (4.521)	-0.215 (0.278)
Inflation	-0.00689 (0.0429)	-0.214*** (0.0476)	-0.243 (0.162)
Financial development	-0.0251 (0.0347)	1.519*** (0.446)	-0.0346 (0.0387)
Debt	0.0390 (0.0526)	-0.220 (0.429)	-0.116 (0.0785)
FDI	1.897* (1.140)	-14.75*** (4.397)	4.023*** (1.347)
Saving	0.0181 (0.0963)	-1.586** (0.620)	-0.0118 (0.141)
Private investment	0.149 (0.224)	4.445*** (1.384)	0.00784 (0.273)
Growth	-0.146 (0.194)	-1.320 (1.082)	-0.373 (0.246)
Political stability	-0.952 (0.702)	-1.126 (5.639)	-0.223 (0.800)
Institutional quality	0.356 (0.730)	10.39 (12.20)	0.853 (0.978)
Banking non interest income	0.177 (0.230)	-1.824*** (0.573)	0.469 (0.414)
Foreign banks	-0.0846** (0.0368)	-0.437*** (0.169)	-0.0551 (0.0575)
Banking marging	-0.0776 (0.305)	3.623** (1.594)	-0.338 (0.495)
Population	1.158 (0.769)	25.12*** (9.693)	1.553 (1.191)
Constant	11.69 (10.70)	-22.55 (33.82)	-0.0297 (14.09)
Country FE	YES	YES	YES
Year FE	YES	YES	YES

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

Table 4.5 Estimation using Milesi-Ferretti capital outflows indicators.

VARIABLES	(1)	(2)	(3)	(4)
Banking regulation	-0.431** (0.177)	-0.118* (0.0602)	-0.105*** (0.0329)	-0.271** (0.132)
Inflation	-0.00217 (0.0253)	0.00241 (0.0107)	0.0159 (0.0153)	-0.00865 (0.0548)
Financial development	0.0256 (0.0224)	0.209*** (0.0200)	0.150*** (0.0151)	-0.00453 (0.0201)
Debt	-0.166*** (0.0520)	0.00901 (0.0140)	0.00218 (0.00787)	0.0306 (0.0233)
FDI	2.006* (1.189)	0.0409 (0.344)	-0.292 (0.272)	2.433*** (0.747)
Saving	-0.161* (0.0896)	0.0710** (0.0282)	0.0321** (0.0144)	0.0213 (0.0529)
Private investment	0.264 (0.180)	0.00223 (0.0557)	0.0242 (0.0304)	-0.233** (0.0994)
Growth	-0.335* (0.178)	0.0578 (0.0719)	0.0527 (0.0393)	0.0749 (0.158)
Political stability	-0.506 (0.605)	0.0561 (0.191)	0.0445 (0.120)	-1.074*** (0.387)
Institutional quality	-0.913 (0.580)	-0.274 (0.234)	-0.209 (0.148)	1.044** (0.445)
Constant	20.74*** (7.596)	-1.052 (2.594)	1.063 (1.591)	8.721 (5.346)
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

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

Table 4.6 Robustness using banking concentration indexes.

VARIABLES	(1)	(2)	(3)	(4)
Banking regulation	0.149*** (0.0488)	0.176*** (0.0525)	0.136*** (0.0459)	0.152*** (0.0484)
Inflation	-0.00705 (0.0348)	-0.00716 (0.0313)	-0.00964 (0.0437)	-0.00783 (0.0429)
Financial development	-0.00235 (0.0240)	-0.0158 (0.0251)	-0.00272 (0.0281)	-0.0117 (0.0280)
Debt	-0.146*** (0.0535)	-0.146*** (0.0529)	-0.0913* (0.0552)	-0.0971* (0.0552)
FDI	1.127 (1.201)	1.351 (1.179)	0.999 (1.099)	1.314 (1.092)
Saving	-0.152 (0.0929)	-0.138 (0.0898)	-0.0242 (0.0929)	-0.0161 (0.0923)
Private investment	0.399** (0.192)	0.370** (0.185)	0.254 (0.189)	0.227 (0.186)
Growth	-0.298* (0.180)	-0.308* (0.180)	-0.241 (0.194)	-0.262 (0.193)
Political stability	-0.250 (0.613)	-0.345 (0.607)	-0.256 (0.676)	-0.273 (0.676)
Institutional quality	-1.062 (0.672)	-1.056 (0.654)	-0.594 (0.693)	-0.607 (0.693)
Banking non interest income	0.430** (0.196)	0.557*** (0.196)	0.421** (0.203)	0.534*** (0.198)
Constant	2.752 (6.654)	-2.311 (6.734)	1.537 (7.501)	-2.365 (7.612)
Country FE	YES	YES	YES	YES
Year FE	NO	NO	YES	YES

Table 4.7 Robustness with Seemingly Unrelated Regression (SUR).

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Banking regulation	-0.476* (0.270)	-0.228** (0.0912)	-0.476* (0.270)	-0.190** (0.0797)	-0.476* (0.270)	-0.187 (0.244)
Inflation	-0.0275 (0.0632)	-0.00806 (0.0213)	-0.0275 (0.0632)	0.00503 (0.0186)	-0.0275 (0.0632)	-0.0107 (0.0571)
Financial development	0.0148 (0.0437)	0.210*** (0.0147)	0.0148 (0.0437)	0.158*** (0.0129)	0.0148 (0.0437)	-0.0283 (0.0394)
Debt	-0.128** (0.0605)	-0.0218 (0.0204)	-0.128** (0.0605)	-0.00182 (0.0178)	-0.128** (0.0605)	0.00566 (0.0547)
FDI	2.818* (1.503)	0.642 (0.507)	2.818* (1.503)	-0.454 (0.443)	2.818* (1.503)	2.224 (1.357)
Saving	-0.292** (0.119)	0.158*** (0.0403)	-0.292** (0.119)	0.0666* (0.0352)	-0.292** (0.119)	-0.0770 (0.108)
Private investment	0.327 (0.233)	-0.0523 (0.0785)	0.327 (0.233)	0.0342 (0.0685)	0.327 (0.233)	-0.106 (0.210)
Growth	-0.546** (0.278)	0.104 (0.0940)	-0.546** (0.278)	0.146* (0.0821)	-0.546** (0.278)	0.532** (0.251)
Political stability	-0.208 (0.866)	0.128 (0.292)	-0.208 (0.866)	0.196 (0.255)	-0.208 (0.866)	-2.137*** (0.782)
Institutional quality	-0.537 (0.925)	0.740** (0.312)	-0.537 (0.925)	0.0773 (0.273)	-0.537 (0.925)	0.0986 (0.835)
Constant	16.23 (11.39)	-9.291** (3.842)	16.23 (11.39)	-1.280 (3.356)	16.23 (11.39)	26.55*** (10.28)
R-squared	0.133	0.767	0.133	0.662	0.133	0.109

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

Table 4.8 Robustness using alternative methods (RE-GLS and GMM).

VARIABLES	(1)	(2)	(3)	(4)
Capital flight-1				0.242** (0.121)
Banking regulation	-0.461*** (0.177)	0.205** (0.0889)	0.243*** (0.0941)	-2.612* (1.582)
Inflation	-0.00909 (0.0278)	-0.0487 (0.0644)	-0.0432 (0.0640)	0.074 (0.234)
Financial development	0.0343 (0.0289)	-0.0493 (0.0570)	-0.0624 (0.0555)	1.023* (0.585)
Debt	-0.0911* (0.0510)	-0.0813 (0.0662)	-0.0798 (0.0651)	-0.352 (0.294)
FDI	1.033 (1.259)	0.930 (1.809)	1.452 (1.766)	13.137 (8.241)
Saving	-0.0608 (0.0925)	-0.358*** (0.132)	-0.326** (0.129)	-0.073 (0.846)
Private investment	0.249 (0.187)	0.677** (0.269)	0.581** (0.260)	-0.790 (0.858)
Growth	-0.272 (0.188)	-0.542** (0.274)	-0.541** (0.273)	-0.141 (1.067)
Political stability	-0.105 (0.690)	-0.707 (0.914)	-0.633 (0.901)	-2.979** (1.442)
Institutional quality	-1.190* (0.687)	-0.639 (1.089)	-0.572 (1.055)	0.000 (0.000)
Banking non interest income	0.611*** (0.206)	0.548 (0.384)	0.672* (0.379)	-2.955 (2.355)
Foreign banks				0.674 (0.869)
Banking marging	0.345 (0.299)			1.056 (1.590)
Constant	12.22 (8.872)	2.399 (10.87)	-7.219 (11.63)	
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
AR(1)				0.0630
AR(2)				0.292
Hasen				0.980
Sargan				0.574

Table 4.9 Robustness excluding outliers.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Banking regulation	-0.522*** (0.177)	-0.590*** (0.172)	0.149*** (0.0488)	0.148*** (0.0535)	0.176*** (0.0525)	0.170*** (0.0547)
Inflation	-0.00520 (0.0249)	-0.0111 (0.0241)	-0.00705 (0.0348)	-0.0107 (0.0350)	-0.00716 (0.0313)	-0.0108 (0.0312)
Financial development	0.0221 (0.0245)	0.0320 (0.0240)	-0.00235 (0.0240)	0.00460 (0.0237)	-0.0158 (0.0251)	-0.00737 (0.0248)
Debt	-0.116** (0.0519)	-0.175*** (0.0545)	-0.146*** (0.0535)	-0.212*** (0.0570)	-0.146*** (0.0529)	-0.211*** (0.0560)
FDI	1.128 (1.218)	0.998 (1.198)	1.127 (1.201)	1.334 (1.186)	1.351 (1.179)	1.534 (1.166)
Saving	-0.0850 (0.0869)	-0.0875 (0.0869)	-0.152 (0.0929)	-0.177* (0.0945)	-0.138 (0.0898)	-0.161* (0.0907)
Private investment	0.334** (0.168)	0.336** (0.166)	0.399** (0.192)	0.362* (0.191)	0.370** (0.185)	0.331* (0.184)
Growth	-0.278 (0.185)	-0.214 (0.188)	-0.298* (0.180)	-0.288 (0.187)	-0.308* (0.180)	-0.296 (0.187)
Political stability	-0.313 (0.633)	0.130 (0.623)	-0.250 (0.613)	0.154 (0.641)	-0.345 (0.607)	0.111 (0.634)
Institutional quality	-1.379** (0.658)	-1.724*** (0.647)	-1.062 (0.672)	-1.232* (0.670)	-1.056 (0.654)	-1.246* (0.654)
banknoninc	0.617*** (0.199)	0.720*** (0.198)	0.430** (0.196)	0.420** (0.200)	0.557*** (0.196)	0.559*** (0.198)
Constant	18.51** (7.703)	18.79** (7.555)	2.752 (6.654)	2.696 (6.715)	-2.311 (6.734)	-2.291 (6.731)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Table 4.10 List of countries.

Angola

Botswana

Burkina Faso

Cameroon

Congo. Dem. Rep.

Cote d'Ivoire

Ethiopia

Kenya

Madagascar

Malawi

Mauritania

Mozambique

Nigeria

Rwanda

Sierra Leone

South Africa

Sudan

Tanzania

Uganda

Zambia

Zimbabwe

5

General Conclusion

The objective of this thesis was to study private capital mobility and financial flows in Sub-Saharan African countries through three essays. The thesis, conducted in an economic context characterized by significant growth in private capital flows in Sub-Saharan African countries, addressed three main questions: What is the dynamic link between foreign direct investment flows and domestic private investment? How does weak banking and financial regulation influence capital flight? To what extent does local financial development contribute to an efficient allocation of migrant remittances via domestic private investment? To answer these questions, we mobilized literature, data and employed several empirical strategies organized in three respective chapters.

The first chapter examine the relationship between foreign direct investment and private investment in Sub-Saharan Africa with a sample of 40 countries over the period 1980-2017. In order to distinguish between short- and long-term dynamics, the analysis was based on panel error correction models (PMG, MG and DFE). The results suggest that foreign direct investment has little effect in the short term, but stimulates private investment in the long term. The results also suggest that foreign direct investment interacts with domestic public investment to reinforce these positive effects. Also, the results suggest that the impact of foreign direct investment on domestic private investment is stronger in diversified non-natural resource exporting in comparison to resource exporting countries.

The second chapter aimed to understand whether the development of the local financial sector is a precondition for migrant remittances to foster domestic private investment in the Sub-Saharan African region. A panel of 40 countries over the period 1980-2019 has been used through three econometric methods: FE, RE, FGLS and Quantile regression. A battery of financial development indicators such as the level of credit to the private sector, bank deposits, bank liquidity, the rate of bancarization and the degree of bank coverage were used. The empirical analysis showed, firstly, that remittances have a positive impact on private investment in the region. Secondly, the study shows that the marginal effect of remittances on investment decreases with the level of financial development of countries. Migrant remittances have a greater impact in countries where the financial sector is poorly developed, as they serve as a credit constraint. A high level of financial development reduces the role of remittances in investment.

The third chapter investigated the relationship between capital flight and banking regulation and supervision in Sub-Saharan African economies. A panel of 21 countries over the period 2000-2017 has been used through three econometric methods: FGLS, SUR, RE-GLS and GMM. The results indicate that the quality of banking regulation and supervision reduces the incentive of capital flight from Sub-Saharan African countries. More specifically, we find that regulation of capital adequacy (by improving bank soundness), regulation of banking competition (by reducing bank concentration and the entry of foreign banks), have a negative impact on capital flight. The effect of banking regulation and supervision on reducing capital flight is particularly pronounced in countries with no insurance schemes to protect bank deposits.

In the light of these results, economic policy recommendations can be made to improve the management of private capital mobility and financial flows in African countries, in order to increase their contribution to economic development in the countries of this region. These recommendations are structured as follows.

Concerning FDI, we have seen that in Sub-Saharan African countries their positive effects are greater in an environment characterized by economic diversification and macroeconomic stability. It is therefore necessary to combine policies to attract FDI with structural policies to diversify economic activity. In the short term, macroeconomic policies have an essential role to play in enabling FDI-receiving countries to limit their exposure to undesirable effects such as exchange rate appreciation, and a deterioration in the competitiveness of domestic companies. These macro-economic policies must be healthy and focused on strong, sustainable economic growth, price stability and sustainable external accounts. Prudent fiscal policies that limit excessive fiscal deficits and indebtedness are particularly important to avoid crowding-out effects that put pressure on domestic interest rates. This means encouraging medium-term fiscal discipline, efficient and socially equitable tax systems, and prudent public sector debt management. It also means working to strengthen an appropriate institutional framework that guarantees the transparency and fiscal solvency of countries in the region, through the adoption of transparent and effective fiscal rules. The adoption of transparent fiscal rules will help avoid chronic budget deficits, which are a source of macroeconomic instability.

It is important to strengthen countries' internal financial systems, so that local financial resources can complement foreign investment. Priority must be given to the development of capital markets and financial instruments that encourage savings and ensure the efficient distribution of credit to domestic businesses. This will help to alleviate financing constraints in general, while enabling the development of local businesses to benefit from the opportunities offered by the activities of foreign companies. In the context of Sub-Saharan African countries, improving the climate for business is fundamental to attract FDI. To this end, efforts to promote good governance need to be stepped up, in particular by fighting corruption more actively and improving policy and regulatory frameworks to protect property rights, competition and intellectual property, in order to encourage dynamic domestic businesses.

When it comes to structural reform, the question of physical and technological infrastructure is crucial in Sub-Saharan African countries. The presence of such infrastructure is essential to attract multinational companies, to enable domestic companies to integrate technological spillovers generated by foreign-owned companies in the production process, and to promote their diffusion in the recipient economy.

In terms of economic diversification, a number of Sub-Saharan African countries are still heavily dependent on commodities. Countries such as Nigeria, Angola, Mauritania, Sudan, Guinea-Bissau and Chad are over 90% dependent on the export of natural resources. In this context, the high concentration of exports around a small number of basic products limits the ability of FDI to interact with domestic companies to boost domestic investment. High concentration can also be a source of macroeconomic instability, undermining the capacity of domestic companies. Sub-Saharan African countries therefore need to develop diversified economies through manufacturing and new technologies, which are more likely to attract FDI. The transition to a more diversified production and export structure offers a multitude of advantages. It reduces the probability of having FDI concentrated in a single sector, with little connection to domestic firms. Diversification also reduces the volatility of export revenues, which in turn reduces the volatility of public revenues needed for infrastructure investment to stimulate domestic investment. By reducing the instability of public revenues, diversification can also reduce the high tax burden on domestic companies, enabling them to increase their resilience in the face of FDI competition. As part of this diversification strategy, Sub-Saharan African countries need to focus on investments that introduce new technologies and know-how, enabling a complementary relationship to be established between foreign direct investment and domestic investment. Given that foreign direct investment interacts with public investment to boost domestic investment, it is necessary to promote public-private partnerships and mixed financing focused on project development in order to leverage foreign direct investment and thus facilitate a wider spread of the expected benefits. Small and

medium-sized enterprises are recognized as catalysts of economic growth and employment in Sub-Saharan Africa. They create around 80% of total employment and contribute over 50% of the continent's GDP. From this perspective, measures to channel investment flows towards the development of small and medium-sized enterprises could have a positive effect.

Regarding remittances, we have seen that they have a positive impact on private investment, and that this impact is greater in countries where the financial sector is underdeveloped, as they reduce credit constraints. In this context, two types of policy are needed. Policies to encourage migrant remittances, combined with policies to promote financial development. In Sub-Saharan African countries, the main challenge is to reduce the cost of remittances, which remains particularly high. The average cost in 2019 was just over 8%, while in most other developing regions it was below 8%. The costs of intra-African transfers are much higher still, averaging almost 14% (World Bank, 2019). Introducing measures to ensure competition in remittance markets could help reduce the costs of sending remittances to these countries, and thus increase remittance volumes. With the strong growth of the telecommunications sector and the development of mobile banking in Sub-Saharan Africa, measures to encourage competition between financial institutions and promote partnerships between banks and remittance companies are needed. Ensuring lower fees for sending money would certainly enable larger transfer flows to use the informal financial circuit, as the informal sector's share of the transfer market is very large, even if difficult to quantify. In particular, international institutions have an important role to play in convincing remittance-receiving countries to undertake or accelerate the necessary reforms. Given the high cost of remittances in sub-Saharan African countries, it is essential not to exert heavy fiscal pressure on remittances, as this could lead to a decline in transfer activity or increase transaction costs, diverting part of the flow from formal to informal channels. Consumption-based taxation, already in place in some countries, provides the incentive structure to maximize the benefits of remittances for households, while enabling recipient

countries to finance their budgetary expenditure with the least possible distortion to economic activity. Some countries, such as Nigeria, in collaboration with major banks such as Bank of America, Standard Bank of South Africa and Merrill Lynch, have begun issuing diaspora bonds to raise resources for investment. A diaspora bond is a retail savings instrument marketed exclusively to members of a diaspora. The Nigerian government has issued this bond as a new alternative to finance development projects. This is the first time that a Sub-Saharan African country has taken such a major step onto the stock market. These types of projects could be extended to other sub-Saharan African countries, to channel remittances into productive investments.

Private investment in Sub-Saharan African countries is low due to poor investment opportunities linked to the lack or poor functioning of certain infrastructures and the poor quality of institutions. So, to maximize the effect of remittances on domestic investment, it is necessary to maintain a stable macroeconomic environment through investment in infrastructure and public institutions. It is important to keep in mind that remittances can pose a moral hazard problem by reducing labor supply. Countries receiving remittances that rely too heavily on taxes on labor should adopt consumption-based tax systems to mitigate any negative effects. Transfers can also pose a moral hazard problem by reducing the political incentive to adopt public investment policies. Remittances that insure the public against adverse economic shocks, including those caused by poor economic policies and weak institutions, can reduce households' incentives to pressure their government to introduce the reforms needed to facilitate the development of an environment favorable to private investment.

Finally, we have seen that, in parallel with the rise of foreign direct investment and remittances, Sub-Saharan African countries are experiencing significant capital flight, and that the quality of banking regulation and supervision reduces the incentive of capital flight from these countries. In the context of Sub-Saharan Africa, capital protection and

improvement of business climates, transparency in the management of public funds and the creation of a stable political and economic environment are among the reforms that are essential in the fight against capital flight. Coordinated action at international level to combat tax evasion can also discourage illegal capital outflows. This means that these countries need to establish solid cooperation with their partners in the developed world. On the banking side, it is necessary to work towards strengthening the solidity of national banking systems, developing well-regulated local financial markets, while offering adequate protection to consumers. This is particularly crucial in the current context, where Sub-Saharan African countries are experiencing financial innovation through improved financial inclusion linked to the emergence of financial products such as mobile banking and microfinance credit. In this respect, we have seen that although deposit insurance is widespread in other parts of the world, its adoption is still limited in Sub-Saharan African countries. In the context of Sub-Saharan African countries, characterized by an economic environment with multiple uncertainties, its adoption will ensure the stability of banking systems and protect bank depositors against the risk of bankruptcy. Banking competition in Sub-Saharan Africa has improved over the past decade, but in some countries banking systems are still highly concentrated. Encouraging greater banking competition is necessary, because as we have seen, the presence of foreign banks discourages capital flight, as they are perceived as a factor of stability insofar as their subsidiaries established in the country are subject to their parent company's supervision and enjoy group solidarity, in terms of risk sharing or technology transfer. In the context of Sub-Saharan African countries, the implementation of rigorous supervision of banking systems by promoting restrictive asset and activity holding policies that prevent banks from engaging in excessive and risky activities. Respect of capital adequacy requirements, which aim to ensure that banks hold sufficient capital to remain solvent at all times, i.e. to withstand unexpected shocks. At the international level, a more transparent financial system that ensures cooperation with international supervisory authorities by providing relevant financial

information without hiding behind banking secrecy laws will benefit not only sub-Saharan African countries, but all developed and developing countries too.

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