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Fill the infrastructure gap and maintain macroeconomic stability in Africa

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Advanced Master in International and Development Economics

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**FILL THE INFRASTRUCTURE GAP AND MAINTAIN
MACROECONOMIC STABILITY IN AFRICA**

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0. Acronyms and abbreviations

List of acronyms

AfDB	African Development Bank
AICD	Africa Infrastructure Country Diagnostic
DRC	Democratic republic of Congo
DSA	Debt sustainability analysis
ECG	Electricity Company of Ghana
EUR	Euro
EURGHC	Euro to Ghana cedi exchange rate
FDI	Foreign direct investment
GDP	Gross domestic product
GHC	Ghana cedi currency
HIPCs	Highly indebted poor countries
ICA	Infrastructure consortium for Africa
IFC	International finance corporation
IMF	International monetary fund
LIC	Low income country
LMICs	Low-Middle income country
MDRI	Multilateral Debt Relief Initiative
MIC	Middle income country
MW	Megawatt
ODA	Official development assistance
ODF	Official development finance
OECD	Organization for Economic Cooperation and Development
PPPs	Public-Private Partnerships
SSA	Sub-Sahara Africa
S & P	Standards & Poor's
USD	United states Dollars
WB	World bank

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II. Introduction

For several decades, the African continent has been characterized by successive wars and political crises of all kinds that have destroyed its economy and made the continent very poor. African countries are currently among the poorest in the world with a very high investment need to fight poverty and return on the growth path.

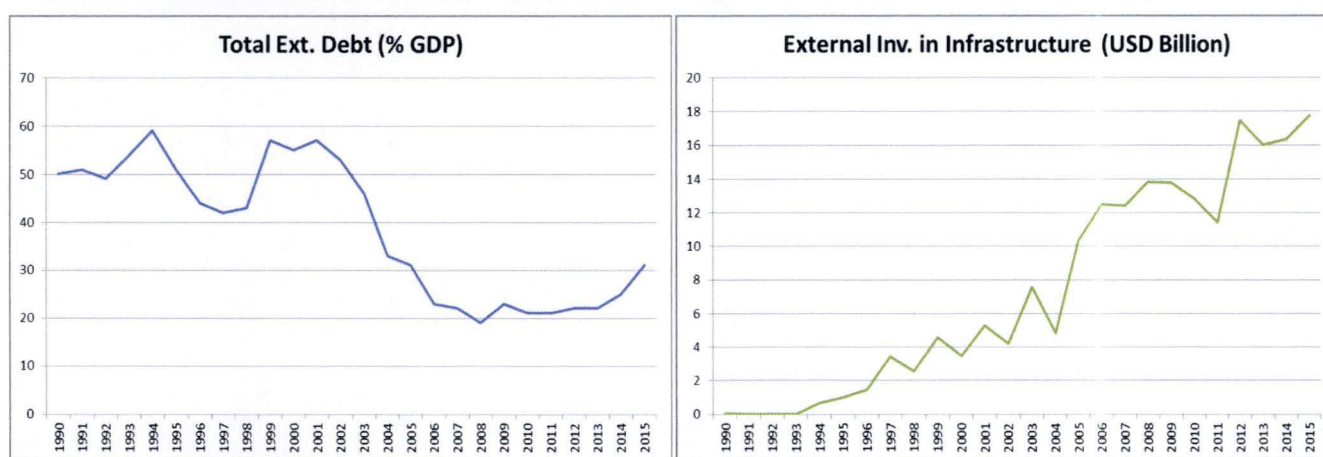
During the last decade, Infrastructure has been responsible for more than half of Africa's recent improved growth performance and has the potential to contribute even more in the future, states the IMF. In fact, nowhere is lack of infrastructure more crucial and potentially transformational than in sub-Saharan Africa. According to the Africa Infrastructure Country Diagnostic (AICD), a project published in 2008 by the World Bank that offers baselines and benchmarks of infrastructure needs and improvements, the annual funding gap for infrastructure projects in sub-Saharan Africa is about USD 93 billion a year for both capital expenditures and maintenance, only USD 45 billion is being mobilized, domestically financed mainly, with the central government budget being the main driver of infrastructure investment, leaving a gap of close to USD 50 billion a year.

By convention, infrastructure is broadly divided into two categories: economic and social. The former conventionally includes transport, communications, power generation, water supply and sanitation facilities, while the latter includes educational and health-care facilities, though some authors include cultural and recreational facilities (DBSA, 1998). Infrastructure spending is therefore defined as capital expenditure by government to provide public goods and facilitate transactions (Gramlich, 1994).

Most African countries are post conflicts countries, in the group of Low and/or middle Income Country with a high level of poverty rate and an insufficient tax base to fund all the government needs for such capital expenditure. In addition, institutional problems linked to the corruption and management of those countries does not allow an optimal revenue collection which can help countries have sufficient funds to implement their policy. Moreover, official development finance to Africa's infrastructure is unlikely going to increase further significantly and their actual proportions in total spending are still modest compare to the global need in this sector. There's therefore a significant funding gap to be fulfilled in the continent.

For these reasons among many others, most of African countries have had an excessive use of external financing, in the form of loans, to finance their projects (political or economic) which increase African countries debts level so high that it became unsustainable. Through the HIPC initiative launched by the World Bank and the IMF in 1996, many African countries have seen their debts erased up to 90% upon reaching the completion point. The following graphs illustrate the average trend evolution of external debt stock ratio to GDP in SSA countries and the total foreign investment stock in infrastructure (transport, electricity, water supply and sanitation, telecommunication, etc.) in SSA countries from 1990 to 2015.

Figure 1. Total external debt to GDP ratio in SSA **Figure 2. Foreign Investment in Infrastru. of SSA**

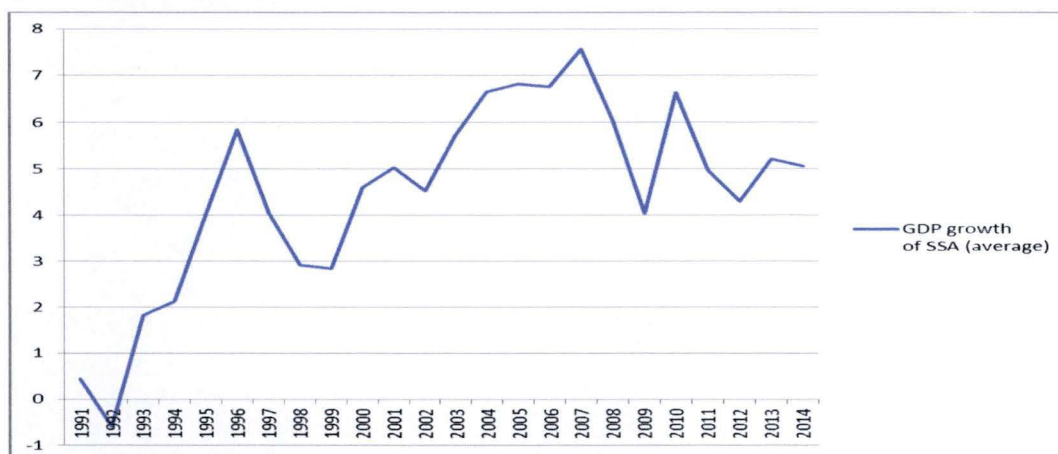


Source: Author from data of World Bank and Economic watch online statistics portal

Since 1997, more and more public funds started being oriented in infrastructure development projects in Africa. In fact, Sub-Sahara African countries have, thanks to the debt relieve initiative, enough fiscal space to be used for external borrowing and became highly tempted to external borrowing for funding their development projects.

At the same time, we observed, as illustrated in the figure 3 below, that many Sub-Sahara African countries have been experiencing high rates of GDP growth since 1998 as a result among others of the debt relieve and the huge infrastructure investment performed in those countries. All these changes, along with the ongoing process of urbanization and modernization, have resulted in high demand for infrastructure funding.

Figure 3. **Growth rate of SSA (%)**



Source: Author from data of economy watch for Sub Saharan African

Initially the external financing of HIPC countries and/or Low-Income countries was comprised of grants, concessional loans and credit from bilateral and multilateral sources. One of the issues related to these concessional tools of financing is the fact that the allocation of multilateral aid to countries is largely on a “performance” basis (instead of taking more account of desperate funding needs of post-conflict and fragile states). Moreover, for most developing countries, aid has some key disadvantages, notably extensive use of policy and procedural conditions which can compromise national policymaking independence¹. In addition as mentioned earlier a small portion is available for infrastructure or agriculture.

The recent general trend of African countries financing is definitely to diversify their resource mobilization. Over the last decade, more and more African countries have mainly resorted to non-concessional borrowing from bilateral and multilateral agencies, to issue bonds on the international capital markets and contracted Public-Private Partnership for financing their development, as an alternative or complement to the relative scarcity and strict conditionality from official or natural donors.

The bilateral loans to African countries which increasingly evolved the past decade is the Chinese loan. Many Africans praise China’s contributions to their nations’ infrastructure, highlighting visible improvements that contribute to expanded economic activity, job creation for local workers, and tangible improvements to roads, rails, bridges, and other transportation

¹ Development finance international, Diversifying sources of financing for development, 2009, page 8, §2

networks. Most accept Chinese engagement on the continent as a positive development for African economic growth and are seeking ways to leverage the opportunity to their advantage.

In their search for innovative financing to finance major infrastructure projects, African countries have, since 2006, issued bonds on the international market. This new trend is mainly motivated by the rapid availability of capital to be able to respond as soon as possible to the needs of the rulers without prerequisites and conditionalities.

The Public-Private Partnerships are others new evolving trend of financing in SSA. These are contractual arrangements between the public and private sectors for delivering public use infrastructure projects efficiently and in a manner that reduces the costs to the end users (OECD, 2012). African countries are hoping that this development finance model — where the state shares risk and responsibility with private firms but ultimately retains control of assets — will improve services, while avoiding some of the pitfalls of privatization: unemployment, higher prices and corruption (Peter Farlam, 2005).

As Stiglitz and Rashid (2013) noted, it has become increasingly evident that the need for financing of infrastructure in African countries cannot be met by official development assistance and concessional loans available only. African governments are looking to these tools of funding to radically improve their economy and enhance the standard of living of their people. The challenge for these countries is therefore the right adjustment to accelerate the growth of their respective countries while maintaining their macroeconomic stability, which is a prerequisite for achieving and maintaining a solid economic growth. Indeed infrastructure projects which are expensive to develop and maintain can impact on debt dynamics and in some cases macroeconomic stability.

This paper will try to find out what can be the consequences, in a theoretical perspective, of those new tools of financing in macroeconomic stability, in the context of African countries. These new tools of financing are various and getting more and more innovative as its structures kept evolving over time with respect to the commitment taken by African countries in order to benefit from the funds. We will try then to find out the kind of long term commitments that African countries are taking in relation to the financing tools and how these commitments can affect the macroeconomic stability in the long run.

Our paper will thus focus on how African countries can finance a massive investment program from a macroeconomic point of view in order to maintain sustainability, in relation to their borrowing process, being able to repay borrowings without jeopardizing the pursuit of a sustainable fiscal policy of the country in the long run.

a. Objectives

With respect to the research question, our paper will begin by analyzing how the main sources of infrastructure financing have evolved over the last years, the distribution of that financing on the overall type of financing over the past years and based on that will provide an impartial assessment of the benefits and incurred risks of the use of these new various types of financing for Africa development and the second, will be based on this assessment, to suggest actions countries can take for themselves to facilitate diversification while ensuring the highest-quality finance and maximum development results by targeting the risks which can be related to each tool.

This paper will at the end offers recommendations on how to better exploit financial synergies needed to address the infrastructure gap. Our purpose is therefore to look for how to finance an expansionary policy while ensuring that it produces the expected effects. We will retain and focus our analysis on non-concessional loans and Public-Private Partnerships as new funding tools used by African countries. We will make an assumption that these funding are well used by the governments for fulfilling the objectives on which they have been raised.

The subject will therefore be focused solely on different kind of funding by trying to find a balance between expansion and stability, on how an African state will be able to carry its own development program by using fiscal policy instruments in its possession and won't dwell on institutional issues with respect to the effectiveness of capital spending.

The paper begins with an analysis of the three major sources of external financing: official Chinese financing, bonds on the international market and private participation in infrastructure (PPI) investments then will follow a case study on an African country to assess the facts analyzed earlier in the paper. The choice of analyzing these three sources of financing results on the fact that those are in somehow the new emerging trend of SSA means of financing , in fact more and more Africa countries resort to these new tools which are not directly managed and monitored by IMF and WorldBank.

b. Literature reviews

The relationship between infrastructure and economic growth is quite complex. Although infrastructure development is important and necessary for industrial take-off and economic growth, the desire for growth does not necessarily mean higher or increased need for infrastructure and more infrastructures does not necessarily guarantee more economic growth (Romp and de Haan, 2005).

An increase in public infrastructure investment affects the economy in two ways. First, similar to other government spending, it boosts aggregate demand through the short term fiscal multiplier, whose magnitude may vary with the state of the economy. It may also crowd in private investment, given the highly complementary nature of infrastructure services. The increase in government spending will also affect the debt-to-GDP ratio, which may increase or decrease depending on the size of the fiscal multiplier and on the elasticity of revenues to output (Auerbach and Gorodnichenko, 2013).

Over time, there is also a supply-side effect of public infrastructure investment as the productive capacity of the economy increases with the higher infrastructure capital stock. The efficiency of investment is central to determining how large this supply-side effect will be. Inefficiencies in the public investment process, such as poor project selection, implementation, and monitoring, can result in only a fraction of public investment translating into productive infrastructure, limiting the long-term output gains (Pritchett 2000; Caselli 2005)

Whether infrastructure investment is funded by the public or private sector, the source of funds for this investment has a crucial importance, as funding decisions may have significant and sometimes detrimental macroeconomic effects. Ultimately, policy-makers must carefully consider the available funding schemes and attempt to choose that which has the least disruptive effect on the economy as a whole. (Frankel, et al, 2006)

The extent to which increases in public capital can raise potential output is a key factor in determining the evolution of the public-debt-to-GDP ratio over the medium and long term. The debt-to-GDP ratio measure is the percentage using total debt outstanding over the size of GDP of a given country. This indicator is used to measure the government's ability to face its engagement in term of debt and/or public spending by using taxes. The taxes that can be

collected depend on the total of all economic activity, in fact the higher GDP is, the more it is assumed the government has an ability to collect taxes and face its engagements. Thus when the ratio is higher, it indicates that a lot of debt is outstanding and that implies a lot in interest payments. So, it is assumed by many that a higher debt-to-GDP ratio means interest payments are likely a greater burden and thus the chance of eventual default higher.

There is no a specific threshold of debt-to-GDP ratio as being ideal, and instead focus on the sustainability of certain debt levels. If a country can continue to pay interest on its debt without refinancing or harming economic growth, it is generally considered to be stable such as Japan, Belgium or USA which experienced a debt-to-GDP over 100% for years but are still considered as stable countries economically speaking because of their capacity to smooth eventual external shocks. However, according to a study on Modernizing the Framework for Fiscal Policy and Public Debt Sustainability Analysis led by the IMF in 2013, it was reported that a debt-to-GDP ratios of 60% is noted as a prudential limit for developed countries. This suggests that crossing this limit will threaten fiscal sustainability. For developing and emerging economies, 40% is the suggested debt-to-GDP ratio that should not be breached on a long-term basis.

Thus, there is a tendency to treat these benchmarks for debt-to-GDP ratios as optimal in the specific sense that crossing these thresholds can pose threats to the macroeconomic sustainability. Over time, the increase in public investment will affect the debt-to-GDP ratio by affecting countries annual debt-financing burden. In particular, in the long term, an increase in public investment will lead to an increase in potential output, which will generate long term future tax dividends but the tradeoff is the well management of the short and medium term for maintaining economic stability.

For low income countries, the debt-servicing problems are likely to arise when the costs of servicing domestic debt become very high because of the less effectiveness of tax collection capacity of those countries and other institutional problem such as corruption. (World Bank, October 2006). To support low-income countries in their efforts of financing without creating future debt problems, and to keep countries that have received debt relief under the HIPC Initiative on a sustainable track, the World Bank designs, on a country demand, a Debt Sustainability Framework of debt sustainability analysis (DSA). The objective of the World Bank is to assess whether a country's current borrowing strategy may lead to future debt-

servicing difficulties. As a result of this DSA, a country would be classified according to its risk of debt distress.

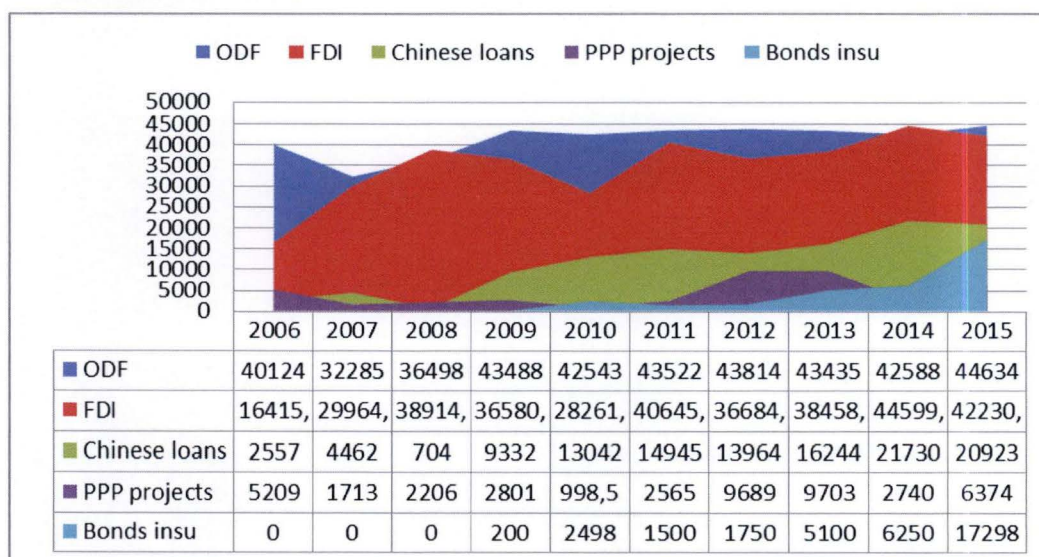
III. Public investment in Africa infrastructure

III.1. General Overview

Recognizing the economic importance of infrastructure development, many SSA countries have begun to devote greater resources to public infrastructure investment. In certain countries, especially those that have benefited from the Highly Indebted Poor Countries program and the Multilateral Debt Relief Initiative, much of this investment has been financed by increased borrowing. Some resource-rich countries such as DRC, Angola or Ghana have backed future exports to secure loans from non-traditional external partners, notably China. Besides, attracted by the exceptional liquidity of international markets, positive terms and lack of conditionality, SSA countries have started issuing bonds. They have prioritized the advantages to them of the lack of conditionality of sovereign bonds over the preferential cost and maturity of concessional financing. In parallel, the share of project financed by public private partnership has become more important.

This feature shows that the composition of Africa external financing offered by traditional and non-traditional partners and private sector sources is changing and the proportion of this diversification is evolving over the years. The following graph shows the trend of the foreign investment in SSA from 2006 to 2015.

Figure 4. **Foreign financing trend (USD billion)**



Sources: Author from data of AidData, OECD Stats, PPI WorldBank and ICA annual report

During this period, we can observe that:

- the level of overall ODF increased. ODF is essentially comprised of official development assistance and aid from OECD countries and some international organization such as the World Bank, the IMF and the African Development Bank. In 2007, we can see a decline of ODF due mainly to the global financial crisis which hits the world economy and so reduce the investment flow for SSA.
- the FDI inflows in SSA has more than double from 2006 to 2015 since Sub-Saharan Africa countries tend to have liberal policies favouring inward flows. The largest inflows are either in sectors in which the region has a comparative advantage (such as natural resources and agriculture) or where there is need for investment and returns are high, such as housing construction.
- China investment rapidly increased and become a major country of financing in SSA due to the important need of fund of SSA to finance their infrastructure projects and the appetite of China on natural resources. Indeed, the large share of China investment was made in resources rich countries.
- There is renewed interest in public-private partnerships for infrastructure in SSA. This is shown by the trend of infrastructure project financed by PPP deals across SSA. The private sector in the contract is whether a local (national) enterprise or an international one depending on the type of the project. The principal projects financed into PPP deal are roads, airports and ports.
- African countries start issuing bonds in the international market as another means of financing their projects. In fact since 2009, the level of financing from bond has significantly increased and more and more countries are willing to issue bonds on the internal market.

III.1.1. Evolution of the 3 tools of financing

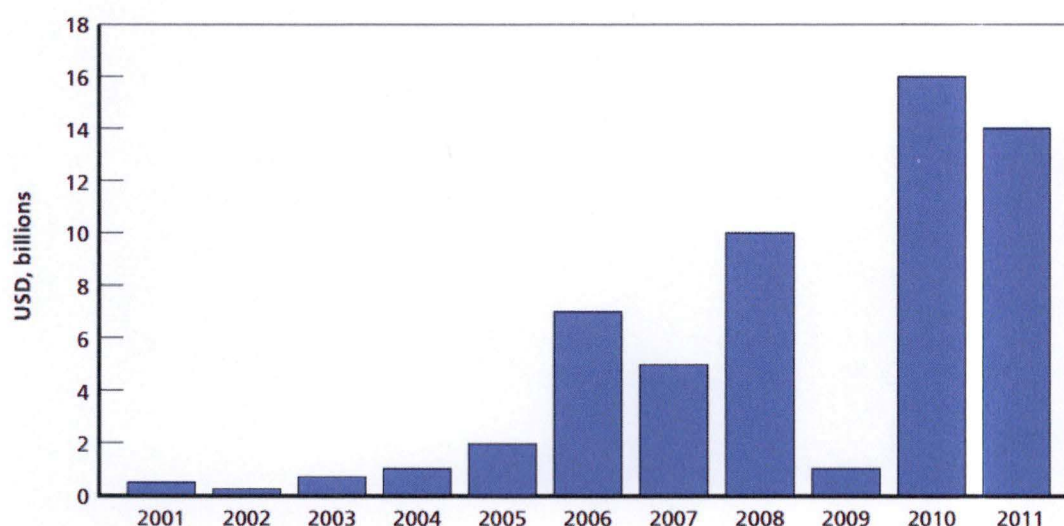
1. Chinese loans

The number of Africa's financing partners has been increasingly active in African countries' infrastructure sectors. Many bilateral governments and/or their agencies offer non-

concessional financing facilities, including export credits to African countries. According to the ICA report 2013, China remains by far the largest single source of funding, contributing over USD 13.9 billion in Africa in 2012 alone and more than USD 60 billion since 2006. Chinese support for Africa-based infrastructure has been weighted towards transportation sectors: rail, roads, airports and seaports.

Chinese financing of infrastructure in Africa has emerged as a major component unique to the China-Africa relationship. As Figure 4 illustrates, Chinese infrastructure investment in Africa increased from around \$500 million in 2001 to \$14 billion in 2011.

Figure 5. **China infrastructure finance in Africa**



Sources: World Bank Report 2008; Standard Chartered Research 2012.

According to world bank (annual report 2008), two-thirds of Chinese infrastructure investment in Africa are driven to the power and transportation.

China's focus on infrastructure can be understood in an economic complementarities process. On the one hand, Africa remains perennially deficient in basic telecommunication, power, and transportation networks and doesn't have enough resources to finance all its development project, while China has developed one of the world's largest and most competitive construction industries and has at the same time a large surplus of financing to provide. On the other hand, as a result of globalization, China's fast-growing manufacturing economy is generating major demands for oil and mineral inputs that are rapidly outstripping the country's domestic resources and African countries are, for most of them, resource-rich countries.

Practically, the vast majority of these infrastructure arrangements are financed by the China Exim Bank, which is devoted primarily to providing export seller's and buyer's credits to support the trade of Chinese goods. In the deal structure, the repayment of the loan for infrastructure is made with future revenue from the sale of natural resources. In most cases, this arrangement is used for countries that cannot provide adequate financial guarantees to back their loan commitments and allows them to package natural resource exploitation and infrastructure development.

In 2004, the Exim Bank of China provided \$2 billion to Angola for infrastructure development in exchange for rights to crude oil. In 2011, China had provided \$14.5 billion in credit to Angola backed by oil exports and used primarily to fund infrastructure undertaken by Chinese companies. In 2007, the Chinese contractor Sinohydro began the construction of 400 MW dam in Ghana, of USD 562 million backed with guarantees through export sales of cocoa beans. In 2007, the China Railway Engineering Corporation and Sinohydro signed agreements with the government of the DRC for a major package to rehabilitate and develop infrastructure throughout the DRC backed with mineral resources on a joint venture exploitation of resources for 30 years.

2. Bonds in international markets

The last decade saw the emergence in Africa of a sovereign bond issuance trend. The most striking feature of this development is the share that SSA countries are increasingly taking, since the second half of the decade, in the cohort of countries on the continent that have successfully issued bonds on the financial markets from which they have been excluded for many years.

Seychelles was the first country in sub-Saharan Africa in 2006, after South Africa, to launch a sovereign issuance, through which a total of USD 200 million was raised. Ghana followed the next year (2007) with USD 750 million. Since then, Gabon, Republic of Congo, Senegal, Côte d'Ivoire, Nigeria, Namibia, Zambia, Tanzania and Rwanda have joined the sub-Saharan sovereign club. Almost USD 5 billion (USD 4.6 billion) was raised during 2013, equivalent to 12% of foreign direct investment and 20% of official development assistance².

² Willem te Velde, Dirk, Sovereign bonds in sub-Saharan Africa, ODI Breifing, n°87, April 2014

Table 1: Uses reserved for recently raised funds through international bond issues.

Country (year)	Value (in USD millions)	Use
Gabon (2013)	1,500	USD 610 million for debt management
Ghana (2013)	750	For capital expenditure and refinancing public debt to reduce the cost of borrowing
Nigeria (2013)	1,000	To finance projects in the electricity sector, which is undergoing privatisation; desire to shift from domestic borrowing towards cheaper foreign credit
Rwanda (2013)	400	Construction of a 28- megawatt hydropower plant, the construction of a hotel and pay off some of state-owned RwandAir's debt
South Africa (2013)	2,000	Extend maturity of debt, use low financing costs, finance roads and power
Zambia (2012)	750	To invest in infrastructure.

Source: Hou & alii (2014)

In general, the SSA countries have issued international obligations with various motivations. These motivations range from financing deficits, public debt management reasons, such as debt restructuring, but also for their public infrastructures needs. The previous table gives examples of usage reserved for the amounts of recent sovereign bond issues in SSA. This shows that public infrastructure financing is very well represented. Virtually all recent emissions are affected by this use of infrastructure expenditure.

In practice, a bond issue in a country begins with the recruitment of a financial advisor (much more important for the first-issuing countries) which plays the role of advisor throughout the process and helps to the recruitment of the legal advisor (who will in his turn help to the legal framework and the drafting of the strategic document) and the lead bank (which is the merchant bank which, together with other peer banks, will be in charge the issuance of securities and the research of investors who may subscribe) and finally the drafting of the document to promote the issue, technical analysis and determination of the terms of the issue, including pricing.

3. Public-Private Partnerships

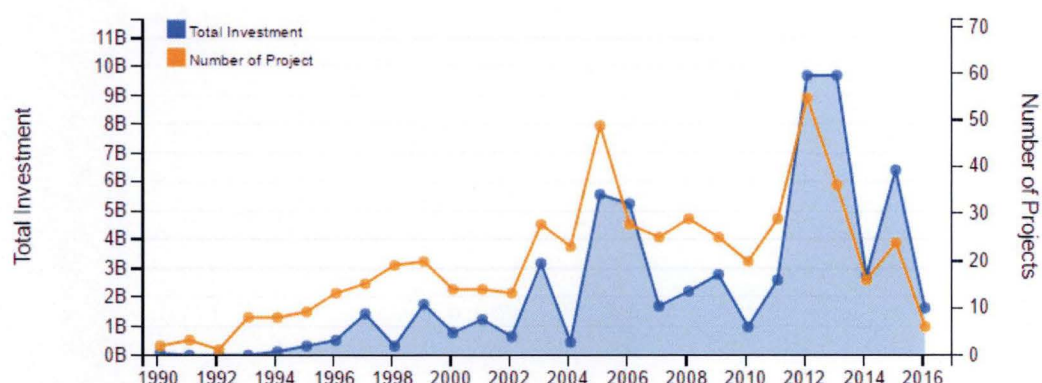
The Public-Private Partnerships have significantly emerged over the last decade. It's seen as one of the best ways to foster development, facilitated by insufficient investment, growing

pressures on government budgets and a general concern about service effectiveness and provision by state enterprises and agencies.

Most of the PPPs projects in Africa are generally in the infrastructure sector, such as port, power, transport, telecommunications, and water and sanitation. The desire of greater efficiency and better services, as well as the limited volume of public resources available to finance such services are now increasingly leading governments to enhance public-private partnerships approach. In fact, a PPP project does not incur direct budgetary debts or debt service costs and comes in various forms structure which are still involving over the time.

As the following graph illustrate, the trend of PPP financing project for infrastructure in Africa has increasing over the years from USD 0 fund project in 1992 to more USD 6 billions of funding project in 2015.

Figure 6. PPPs trend in Africa Infrastructure



Source: PPI worldbank, project timeseries

Practically, they consist of contracts between the government and private sector companies, under which the private sector financier, instead of charging the government for debts incurred, is repaid using, if it works well, other sources of revenue than government budget by operating during a specific time period for recovering its investment (like airport landing fees, road tolls, port management, etc). However, government provide its state payment guarantee to the private part with which it's contracting the agreement in case of default or non profitability of the project for assuring their investment recovery.

III.2. Addressing the risk of external financing

III.2.1. General Overview

Infrastructure is an input to a wide range of economic activities and, as such, an important driver of long-term growth. However, investments in infrastructure projects can threaten macroeconomic stability and not produce the expected results. See as such, risk in a given infrastructure investment can be defined as the measurable probability that the actual outcome will deviate from the expected outcome (OECD 2008).

Beyond many other risky which can affect any investment, there are some risks which make these new financing tools more risky than the traditional ones. Those are the volatility of market price, the fluctuation of the interest rate on the international market and the exchange rate on the receiving country. In fact, the Chinese loans used in Africa are backed on the natural resources exported to China. The contract periods of this loan are at least 10 years. There is therefore a huge probability that the price of those resources changes during the contracted period. Besides, the bond issuance on the international market are not raised on the country national currency nor on special drawing rights used by the World Bank and IMF but rather in dollars or euro and so the country is exposed to a sudden change of the exchange rate due whether on internal or external factors of the country.

These two elements if occurred will have a negative impact on the repayment process since the investment will be more costly than expected therefore potentially increase the public deficit of the country by raising its level of expenses.

In the financing process, some exogenous factors can cause those risks to occur in a country. Those factors are:

- External factors: These are beyond the control of individual countries and economies. In the case of a financial crisis on the international market for example. If the fund has been raised in the financial market, it may affect the country by a sudden increase of the interest rate for example which will have an impact on the annual coupon rate repayment. Basically, the country will pay more than planned which will have a consequence of increase its budget deficit.

- Internal factors: These are whether political or regulatory factor. A sudden political crisis or a change in the regulatory (law, importation rate, etc)) can reduce the profitability of an infrastructure investment in a country and have consequence on the macroeconomic framework of the country.
- Sectorial factor: These include economic or other factors that affect one sector more specifically than another in term of demand or volume of the market for example.

For African countries, especially those who benefited of HIPC initiatives, above the risks highlighted above, the most occur risks to occur are the debt sustainability risk and the inflation risk. In fact, through the impact of borrowing on debt dynamics, the demand for infrastructure investments is likely to grow faster than output, and therefore tax revenues which should cover the debt. Besides, the general increase of domestic spending or the potential depreciation of the real exchange rate might lead to the inflation.

In this section, we will try to highlight the impact that the new infrastructures financing trend might have on macroeconomic stability in short and long run. To do it, we will first give an overview possible impact each one of these financing might have and then illustrate it by basing our analysis on one country case which has benefit of this specific type of financing by seeing how macroeconomic variables evolved over the time and what can be the consequence in the long run.

III.2.2. Risk evaluation of new tools of financing

1. Chinese loans

Agreements pledging future exports as collateral for development loans require careful and objective scrutiny of their terms and provisions. In fact, African countries are most of them still fragile countries, not very diversified and so vulnerable to external shocks since their resilience in the event of a shock is more limited, the risks with china loan are essentially the exposure to the price volatility of the natural resources on which the fund has been guarantee which can lead to a fiscal sustainability risk.

In fact, infrastructure contracts with china are generally huge contracts in billions of dollars representing in many cases biggest part of country's recipient GDP. Large amounts of Chinese deals may undermine fiscal sustainability and reduce the room for maneuver when dealing

with external shocks. Indeed, since all this fund is guarantee by the revenue which will be generated from the natural resources, a decrease in the price of these resources will have a significant impact on the maturity yields therefore the project will take longer and will be higher costly than expected. And this might further be a burden which will be carried by these governments and have impact on the debt sustainability of these countries.

2. Bonds in international markets

The coupon rates of African bonds are well above the concessional borrowing rates which are recommended for African countries whose over-indebtedness is a risk more than elsewhere. Moreover, the maturity of bonds is shorter than concessional loans.

The following table provides a slight overview on coupon rate and maturity of some African bonds issuance.

Table 2. SSA bond issuance yields rate

Countries	Date	Yields	Maturity	Amt \$mn	Rating
Rwanda	4/25/13	7.00	10	400	B
Nigeria	7/2/13	6.74	10	500	BB-
Ghana	7/25/13	8.00	10	1000	B
Kenya	6/24/14	6.88	10	1500	B+
Côte d'Ivoire	7/23/14	5.63	10	750	
Senegal	7/30/14	6.25	10	500	B+
Ghana	9/11/14	8.25	11	1000	B-
Ethiopia	12/4/14	6.625	10	1000	B

Source: IMF & Moody's 2013.

Several types of risk which could affect the macroeconomic stability of African countries using this type of financing can be highlighted, but virtually all are linked to the systemic risk posed by the volatility of international financial markets as exogenous shocks on these countries. The following risks can therefore be analyzed, while bearing in mind that the volatility of financial flows can make them more or less important.

The first risk is the rapid increase in the level of debt and the increase in its weight; this can be considered as the risk of fiscal sustainability as well. In fact, the use of international bond issuance means, if successful, a loan without conditionality and on non-concessional terms for

countries which just benefited of HIPC's initiative. Due to market practices external bonds are issued in large amounts and due in a very short period as illustrated in the previous table. This can have a profound impact not only on the debt sustainability of these countries, but also hinder the formation of efficient debt portfolios. There are therefore relevant DSA vulnerabilities that need to be properly considered for the issuance.

For the funds finance infrastructure, implementation delays may occur as coupon payments and repayment are on the horizon. The increased risk of non-sustainability of the resulting debt is all the more real as the maturity may be shorter than those of the projects (maturity to the profitability of the projects). Moreover, investments may suffer from shortcomings in terms of profitability because of inadequate governance, administrative and engineering capacity in Africa. There will then be a problem of lack of resources to service the debt.

Another major risk that the international bond issue is running is foreign exchange rate risk. Exposure to exchange rate depreciation is the most prominent risk facing SSA countries. As mentioned in Das, Papaioannou, and Polan (2008) global bond issuance may worsen the currency mismatch of government liabilities and revenues, thus increasing the risk of a depreciation of the currency leading to high ex post debt servicing costs.

For African countries as a whole, it is the difficulty, if not the impossibility, of placing bonds in local currency on the international financial markets which is the major factor in changing the composition of the debt in terms of foreign exchange and the resulting vulnerability. The rise in currency risk is a major issue, as excessive exposure to the U.S. dollar in the past was the trigger of many debt crises. Given that the exchange rate in developing countries tends to be countercyclical (depreciating in bad times), a negative external shock could lead to a currency depreciation, GDP contraction, reduced or even negative growth and an increase in debt-to-GDP ratio, and debt servicing costs.

3. Public-Private Partnerships

The risk of this new tool of financing can mainly be linked to the uncertainty regarding the occurrence of certain events during the realization and their impact on the project and furthermore on the macroeconomic stability of the country depending on the depthless of the project. Indeed, PPPs contracts are generally long term contracts; therefore there is a

possibility of a number of different events occurring during the contracting period which can impacting on the effective delivery of the infrastructure service.

Market uncertainty is one of the risks which can arise in this case. In fact, the demand for the infrastructure selected (by the users) might be overestimated or so lower than expected and this can have an impact on the expected investment return and even cause in some extend the rise of tariff for the users of these infrastructures to cover the deficit, or even the transfer of the repayment burden to the state for supplying the gap. This was the case with Henri Konan Bedie Bridge in Cote d'Ivoire, a PPP project between Bouygues and Ivorian government of USD 365 million for 30 years of concession. The contract was built in such a way that the company could recover yearly its investment through toll collection. The estimation of the users was overestimated and so not sufficient to cover the investment return. As consequence, Ivorian government is supplying public fund to cover the deficit.

Another risk linked to PPPs project in Africa is the financial risks. In fact, Infrastructure projects are impacted by financial risks such as exchange rate depreciation and changes in interest rates, which can have a substantial impact on costs and revenues. Most of African PPPs contracts are established in foreign currency (dollars or euro) while the return of investment expected from the users will be in local currency. A depreciation of local currency during the contracting period will have a significant impact of the capital recovery or be a burden which the state should carry to fill the gap.

Those risks, if occurred, can have a spillover effect on the national economy and jeopardize the macroeconomic stability of the country by affecting, the consumption, public savings and investment and leads to poor results.

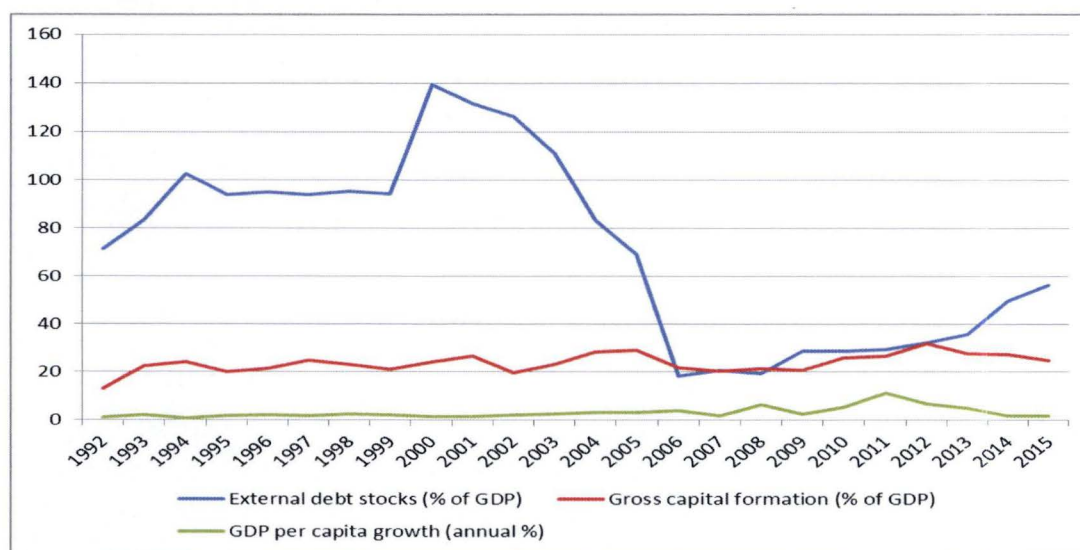
IV. Case of Ghana

IV.1. General Overview

Relying on both external loans and domestic borrowing to support its development made Ghana's debt rise over the years, reaching more than 100% of GDP in 2000. When the IMF and World Bank introduced the Highly Indebted Poor Countries (HIPC) initiative in 1999, Ghana was judged to be a HIPC with unsustainable debt. The country benefited from debt relief under the initiative in 2004 when it met the full policy conditions. Subsequently, in 2006, the country also benefitted from the Multilateral Debt Relief Initiative (MDRI), which offered total relief from debts owed to the IMF, the International Development Association (IDA) of the World Bank, and the African Development Bank (AfDB).

The HIPC and MDRI reliefs resulted in a sharp decline of Ghana's debt to about 20% of GDP, which was considered as a sustainable level. Subsequent to these reliefs, Ghana has been borrowing at a rapid pace to finance mainly infrastructure projects. The following graph illustrates the trend of Ghana government external debt to GDP and gross capital formation ratio from 1992 to 2015.

Figure 7. **Ghana External Government Debt ratio to GDP**



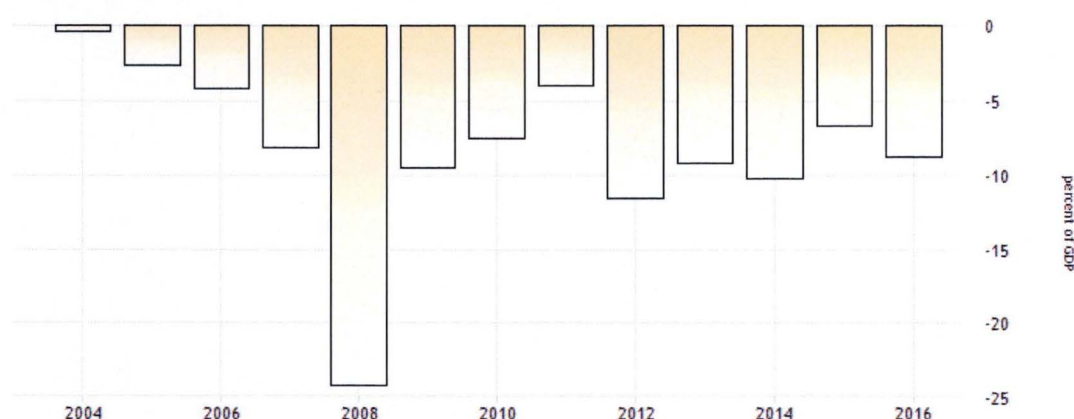
Source: Author, from data of World Bank

Ghana's total debt stock more than doubled from 2006 to 2015, from an equivalent of 26.2 percent of GDP at the end of the HIPC/MDRI period in 2006, the public debt-GDP ratio increased to 58 percent in 2015 reflecting the large fiscal deficit of 14.5 percent of GDP

posted in the year as well as the impact of the currency depreciation³ on the foreign debt-to-GDP ratio, making the country to face a high risk of debt distress and increased overall debt vulnerability

According to the DSA made by the IMF in early 2015, Ghana's fiscal and current account deficit widened significantly, leading to a rapid depreciation of the local currency, re-emergence of high inflation, which increasingly raised public debt. The intensification of external shocks, as well as the disruptions to gas supply and fall in commodity prices, increased debt service costs of the country.

Figure 8. **Ghana Government Budget Deficit (percent of GDP)**



Source: Trading Economics

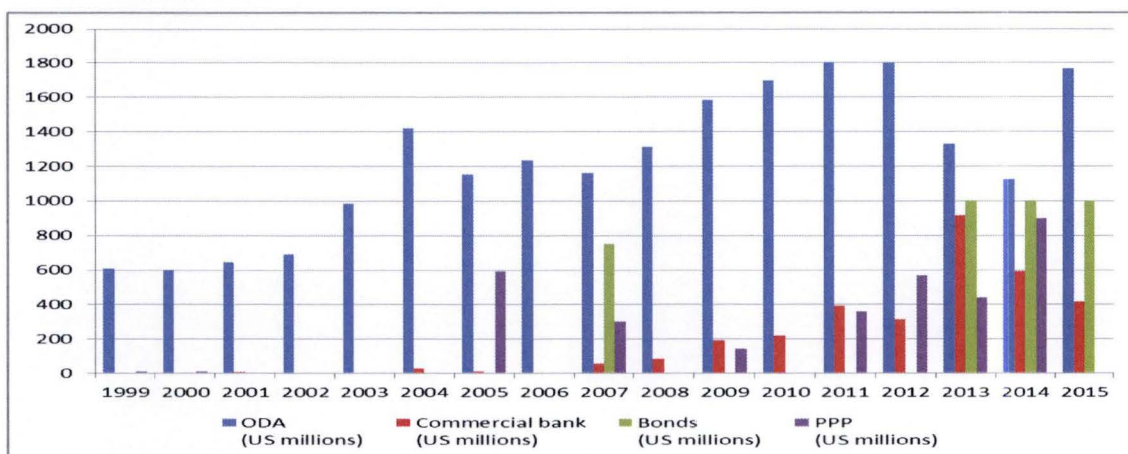
The large budget deficits registered over the years, were mainly financed by funds borrowed from foreign sources. In fact, during this period the country issued its first US\$750 million Eurobond at end-2007 and its second and third Eurobonds in 2013 and 2014, respectively, and has contracted various loans from the China through EXIM banks to finance infrastructure projects.

A major challenge to restoring and maintaining macroeconomic stability and growth in the country is therefore related to the mounting public debt. The debt-GDP ratio is not only rising astronomically but has almost reached a level considered to be above the sustainability threshold, posing serious headwinds to macroeconomic stability and growth. The IMF has projected that the country's public debt/GDP ratio will reach 72 percent by the end of 2017 (IMF, October 2015).

³ Ghana's external debt is denominated in three currencies: the special drawing rights, US dollar and Euro.

The following graph illustrates the flows of Ghanaian foreign investment trend from 1999 to 2015. Before the HIPC initiative, the external financing sources of Ghana were essentially comprised of official development assistance in a very large proportion. After 2004, the country started to diversify its source of financing even though the ODA still remained the important share.

Figure 9. Ghana External Financing trend (USD millions)



Source: World Bank data

IV.2. Assessing the risks of tools of financing in Ghana

1. Chinese loans

In term of the number and weight of infrastructure financed projects, China is the largest foreign investor in Ghana. As part of the deal, in exchange to these investments, China imports raw materials from Ghana. China's main imports from Ghana include: oil products, cotton, gold, aluminium, manganese, timber and cocoa beans. The table below illustrates the value and the type of infrastructures investment projects financed by China.

Table 3. Chinese infrastructure investment backed with natural resources in Ghana

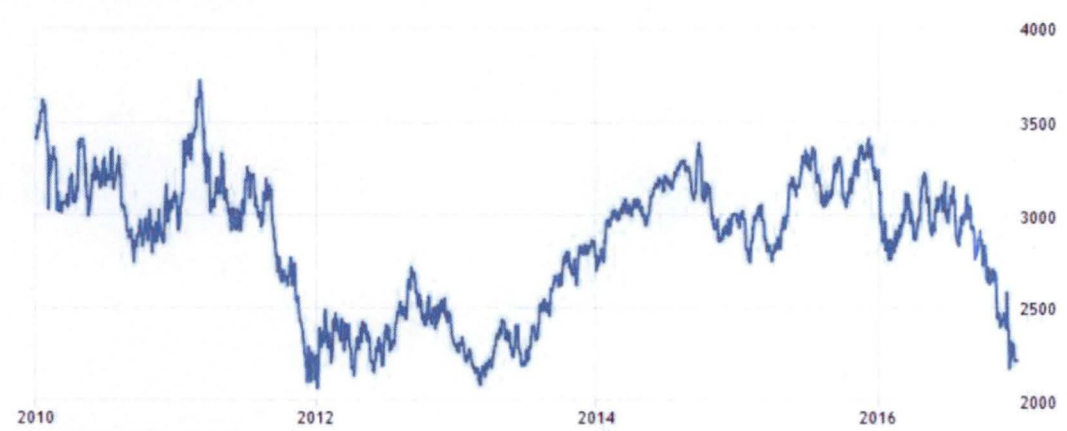
Years	Amount (USD)	Description
2003	28 million	construction of the 17.4 miles section of the Accra-Kumasi Road
2006	275 million	Construction of Takoradi stadium
2006	38.5 million	Construction of Tamale stadium
2007	662 million	Bui Dam energy project for 400 megawatts of electricity
2010	10.4 billion	Kumasi to Paga railway development, energy infrastructure
2011	3 billion	Infrastructure projects

Source: The Ghana Infrastructure Investment fund

The Bui Dam energy project is one of the largest Chinese-funded in Ghana. It cost USD 662 million in the form of commercial loans from China's Export-Import (ExIm) Bank with a 17-year payback. Payments from Ghana were backed by cocoa⁴ revenues which are deposited in an account in the ExIm Bank. In 2014, Ghana government negotiated a 5-year extension on the 17 contracted due to a slight decrease of the price of cocoa on the market and for the repayment not to become a burden for its others projects.

The price of cocoa is quite instable (as illustrated in the following graph) which has a considerable effect on the risk taken by the country. The uncertainty of the market can lead to a sudden change in term of decrease anytime. If this happen, the Ghanaian government will whether carry the surplus of the debt burden on its budget or increase the price of energy for the final users (households and firms) to smooth the shock. Both situations are not good, the first will impact on the government level of national expenditure while the second can have a snowball effect on the prices of goods and services since the higher cost of energy by firms will lead to a higher price of final goods and so might lead to inflation. This is of course a worst scenario that could happen and that deciders should take into account.

Figure 10. Cocoa Price trend (USD)



Source: Trading Economics

2. Bond issuance

In 2007, Ghana joined a growing list of LICs and LMICs in accessing international capital markets by issuing a sovereign bond. The 2007 bond issuance was not used in infrastructure sector but for rising civil servant salary.

⁴ Ghana is in fact the second world's producer of cocoa

In 2013, Ghana issued its second bond on the international market for a value of USD 1 billion. This fund was essentially used for infrastructures and in particular for the construction of Kasoa Bypass Road, the Kwame Nkrumah interchange, the Polo Ground Bypass Road and the Ayanfuri Road for a value of USD 780 million while the other USD 220 million were used to repay the first issuance of 2007. Compared to the other SSA countries, Ghana's yields rate issuance (as illustrated in the table 2 earlier) are relatively higher and so the country faces a higher repayment burden. This reflects the fact that the investors consider that the country has a high risk of default, due to its high debt ratios and the increase of fiscal deficit observed in the country.

As a matter of fact, whether the bond issuance funds were effectively used on the infrastructure or for other government expenses, we noticed that it's followed by a rapid increase of domestic inflation (as illustrated in the figure 10 below). As mentioned in the DSA of the IMF, the successive borrowing process of Ghana through the bond issuance on the international market widened significantly the fiscal and current account deficit, leading to a rapid depreciation of the local currency and a re-emergence of high inflation. And so a deep deficit observed on the above figure 8 in 2008 led to an increase of the inflation rate as shown on the figure 11 below on the years 2008 and 2009. The same pattern on the two figures is after the issuance of bonds on year 2013 and 2014.

Figure 11. Inflation rate in Ghana



Source: Trading Economics

According to the Bank of Ghana report of 2015, the value of the cedi⁵ against the euro has fallen by 50% from 2008 to 2014 (as illustrated in the figure 12 below). This has caused the

⁵ National Ghanaian currency

foreign currency denominated size of Ghana's economy. Because external debts are owed in dollars and euro or other foreign currencies, this has in turn increased the relative size of the debt and debt payments. External debt has grown from 30% of GDP in 2013 to an expected 56% in 2016.

This is a considerable concern with regard to external borrowing in currency depreciation, and Ghana's currency depreciated significantly. When Ghana launched its first bond in 2007, the cedi was virtually at parity with the dollar but in 2015, C1 became equivalent to only \$0.026. In other words, the \$750 million Eurobond, equivalent in 2007 to about C750 million, was in 2015 equivalent to a fiscal burden of about C3 billion. This picture shows that the infrastructure investment made through the bond issuance was not good for the Ghanaian external debt in particular and the Ghanaian economy in general.

T Velde (2013) reports that the debt service from the 2013 Ghanaian issue could rise by 7.875%, the coupon value, to about 22% simply because of an annual depreciation rate of 14% Observed since 2007. Moreover, dollar interest rates paid by the country are expected to increase as the US Federal Reserve continues to raise its rates.

One response to these economic shocks has been for the government to borrow more money, most visibly through USDs 1 billion of bond issues 2014 and 2015. These new issuances, according to the Ghanaian government, will essentially be used to make the external debt plugging the gap created by revenue being lower than expected and so only refinance existing debts on previous infrastructure that are maturing.

Basically, Ghana will pay twice the interest to fund the same infrastructure. If this situation remains, it will lead to government spending cuts and/or tax increases, and will take demand out of the economy, thereby reducing growth and risking a classic debt trap where austerity leads to less growth, which in turn increases the relative size of the debt, which leads to more austerity and less growth, and so on.

Figure 12. EURGHC exchange rate



Source: Trading Economics

3. Public-Private Partnerships

Many projects in Ghana has been financed by partnership with private sector, such as the Accra-Kumasi highway, the Accra-Takoradi road project, the rehabilitation and expansion of the Takoradi Port, the Korle-Bu teaching hospital diagnostic centre, the Accra-Tema motorway project and the development of various airports in the country.

Prior to the development of PPP, Ghana created a Road Fund in 1985, funded by fuel levy, to improve the maintenance and capacity of the nation's highways. However, this fund provided only 5% of the Fund's revenues. Given the poor financial standing of the Road Fund, Ghana saw the PPP as of the alternatives.

The World Bank Ghana launched a PPP Diagnostic Study which played an important role in developing the country PPP guidance that helped the country to have strict steps to follow before signing any PPP contracts such as having a legislative, institutional, financial, fiduciary and technical framework to generate a pipeline of bankable PPP projects including prefeasibility studies in prior of all project to avoid market uncertainty on the project, etc. This framework helped the country to have fruitful PPP contracts. However, all these precaution don't make the PPP in country risk free.

One of the biggest ongoing PPP project in Ghana is the Cenpower project signed in 2009 for the development of independent power project of 340MW. The total cost of the project is USD 900 million. Cenpower is responsible for designing, building, financing and operating

the project for 20 years. During this period, Cenpower will sell its capacity and all energy produced to the Electricity Company of Ghana (ECG) under Power Purchase Agreement. If the ECG failed to insure the payment, the government guaranteed the repayment.

The ECG's latest published financial statements, for 2014, show that its net loss before tax increased from GHC 22 million in 2009 to GHC 148 million in 2014. Like many other state power-distribution companies in sub-Saharan Africa, ECG is suffering from a combination of low tariffs, power theft and non-payment (including non-payment by the government, its largest customer). Therefore, it's more likely that the ECG might fail on the repayment process. Since, the investment is stated guarantee; the burden of repayment will be carry by the country.

Besides, the contract signed and approved by the Ghanaian parliament was in US dollar whereas electricity tariff in the country is fixed in cedi and the payments of ECG to Cenpower are monthly made in Ghana cedi. There is therefore a long-term currency risk inherent in pricing the tariff in US dollars As can be seen from the historical exchange rates on figure 12, there has been a very large depreciation of the cedi in recent years. Basically, the depreciation of the Ghana cedi adds an extra burden on ECG's already weak finances and so an increase of uncertainty to insure the payment. This figure proves that the PPP project, even well managed ex ante, is not risk free and the country still run a risk by the guarantee given on the project.

V. Conclusion & Recommendations

In an environment characterized by constrained fiscal space, the challenge for governments pursuing economic growth through infrastructure development is to attract external sources of financing and maintain a stable macroeconomic framework. While there may be considerable longer-term capital in the hands of potential investors, the level of risk associated with investing in infrastructure has tended to make these investments challenging. The challenge is, therefore, to find ways both to reduce the overall riskiness associated with infrastructure investment and then benefit the higher growth that might bring those infrastructures while maintaining the macroeconomic stabilities of those countries. This was the spirit behind our approach in this project regarding the specific cases of SSA countries.

There is a need to improve the underlying infrastructure investment climate, planning, project prioritization and preparation to reduce risks. At the national level, this takes political commitment, technical and institutional capacity building, backed by adequate and predictable resources.

Ghana's macroeconomic situation illustrated in this study has worsened in recent years and the country now faces a high budget deficit as well as a high risk of debt distress. Total public debt service-to-revenue ratio is not only on a rapidly increasing path but has breached the indicative long term threshold. Debt service now absorbs a large part of domestic revenues, leaving the country vulnerable to shocks. However, Ghana is a Middle income Country and as such had better macroeconomic framework than many others SSA countries in the group of LIC. And so, if similar financing pattern is observed in those countries, consequences might be even worse than in Ghana. As recommendations to mitigate the risk on those imbalances, SSA can:

- develop the domestic capital market and issue fixed-rate long-term bonds denominated in domestic currency to provide budget insurance against supply and external shocks.
- issue bond in regional market instead of international one. For countries with well-developed regional markets (such as the UEMOA regional market) it is a much better option to issue on these markets, as interest rates might be below international markets, which will avoid the major expenses of credit ratings and bond issuance, and there is no exchange rate risk.

- boost invest in projects that have a high private or social return.
- develop strict steps to follow before signing any PPP contracts such as having a legislative, institutional, financial, fiduciary and technical framework to generate a pipeline of bankable PPP

VI. References

- Afdb (2013)**, *The Africa Competitiveness Report 2013*, chapter 2, p. 69.
- Claret consulting (2014)** *Africa PPP: Market update 2014*, Washington DC, 2014
- Commonwealth secretariat (2010)** *Public-Private Partnership and practice A reference Guide*, Marlborough House, UK, 2010
- FMI (2013)**, *Perspectives économiques régionales: Afrique sub-Saharienne*, april 2013.
- Financial Times**, *African countries race to issue bonds*, December 15, 2013.
- Heakal, Reem (2011)** *What is fiscal policy* (Online) October 15th 2014. Available at <http://www. /articles/04/051904.asp>
- Hou, Z., Keane, J., Kennan, J., Massa, I. and te Velde, D.W. (2014)** ‘Shockwatch bulletin: Global monetary shocks: impacts and policy responses in sub-Saharan Africa’, ODI Working Paper, March. London: Overseas Development Institute
- ICA (2015)** *Infrastructures financing trend in Africa*, Africa development bank, Cote d’ivoire
- IFC (2013)** *Advisory services in Pubic-Private Partnerships, creating opportunity where it’s needed most: PPPs in Africa*, May 31, 2013
- IMF (2013)** *Regional Economic Outlook: Sub-Saharan Africa. Building Momentum in a Multi-Speed World*, May. Washington DC: International Monetary Fund (<http://bit.ly/1abNvnU>).
- IMF (2016)** *Regional Economic Outlook: Sub-Saharan Africa. Building Momentum in a Multi-Speed World*, May. Washington DC: International Monetary Fund.
- José Antonio Ocampo (2003)** *Balance of payments dominance: its implications for macroeconomic policy*, Colombia, 2003
- Moody’s (2013)**, *International Sovereign Issuance in Africa 2013-14: A Rating Agency Perspective*, Special comment of october 2013.
- OECD (2012)** *Recommendation of the Council on Principles for Public Governance of Public-Private Partnerships*, May 2012
- Peter Farlam (2005)** *Working together, Assessing Public–Private Partnerships in Africa*, Nepad Policy Focus Report No. 2, Ferbruary 2005
- Ravinder Rena (2011)** *Restructuring a fiscal policy encourages economic growth*, Namibia, Journal of Economics and Business Volume XIV – 2011
- Stiglitz, Joseph & Hamid Rashid (2013)**, *Sub-Saharan Africa's Eurobond borrowing spree gathers pace*, TheGuardian.com, Wednesday 26 June 2013, link:

<http://www.theguardian.com/business/economics-blog/2013/jun/26/subsaharan-africa-eurobond-borrowing-debt>

Te Velde, D W (2013), *Sovereign bonds in sub-Saharan Africa: Good for growth or ahead of time?* ODI briefing n° 87. April 2014. Overseas Development Institute