Procuring and Financing Airport Infrastructure Development in the developing world: China Debt or Public Private Partnerships? Case Study of Entebbe International Airport

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Abstract

Airports are an important asset for any country that seeks to develop or sustain development. Procuring and financing infrastructure has remained challenging. Budgetary allocations to airports are inadequate while Western financier appetite for developing world is declining as needs for procuring and financing infrastructure increase. China has exploited the gap by providing pre non-conditional debt. Existing studies indicate that China debt is easy to access but exiting has come with terrible consequences as post debt conditionalities risk the sovereignty of borrowers. Based on a peer reviewed literature, and documents and with a lens of events at Entebbe international Airport we find that post debt conditionalities are terrible and thus explore and analyze both China debt and the option of public private partnerships. The outcome of this study indicates that public private partnerships (PPP) are a better option than China debt for procuring and financing airport infrastructure. The paper contributes to the PPP body of knowledge by not only providing a comparative analysis of China debt and PPPs as a procurement and financing option but provides for consideration necessary for the uptake of PPPs as a tool in rehabilitating and enhancing airport infrastructure in the developing world. By providing this wisdom, we support policy makers to develop national assets while not risking the loss of their sovereignty, a feature that is associated with China debt.

Key words: Airport infrastructure, Entebbe International Airport, China debt, public private partnerships

Introduction

Public managers are faced with enormous pressure to deliver more services than ever before (Van Dooren, Bouckaert & Halligan, 2015; Vandenabeele, Ritz & Neumann, 2018). Similarly, business leaders are also facing equivalent pressure to deliver products and services of high-quality standards and at competitive prices. Government exerts additional pressure on business leaders like CEOs by expecting annual increases in tax revenue from the business community as public expenditure continues to take an upward shift. In turn, private sector actors under their industry associations are mounting pressure on the government to deliver not only more but much better, faster and in a reliable and efficient manner. The basis of these calls by the private sector is hinged on the view that the government has a role in creating a competitive environment for doing business. To deliver a competitive environment for doing business, the government must provide services like electricity, education, healthcare, transport and bailouts in some cases (Mindlin et al.,2018; Sen,2015; Gleason,2018; Martela et al., 2020; Kiel, Smith & Ubbels, 2014; Mullen & Marsden, 2015; General Motors, 2015; Nduhura et al.,

2017). Notably, creating a competitive environment requires significant resources that are not available.

Decreasing resources amidst rising expectations puts the government in a euphoric situation due to limited finance. To procure and finance infrastructure and services, developing countries like Uganda have traditionally turned to the West to secure aid and grants for national development. The aid and grants from the west has been used to exert conditions such as protection of human rights, democracy and good governance. While some African governments report compliance over the last decade, most governments seem not to have met the expectations. Surveilling the trends, China exploited the opportunity to position itself as an alternative for financing Africa's development agenda. Arguably, the ultimate long-term aim of China's approach to financing Africa is deemed to be a need to change the world's politics and power balance (Rice, 2002; Beeson, 2018; Alden, 2017; Brautigam, 2020: Graham, 2020). Conversely the hurriedly delivered syndicate financing in Africa has been associated with selfish gains driven by the need to get rid of excess capacity resulting in capital accumulation in China. This paper therefore argues that there is an alternative to the dual debts. A country may choose to negate both the western debt and the China debt since both may have inherent components that promote the lenders and not the borrowers' interests. Existing studies have focused investigation on the ills of the China debt in the developing world without providing alternatives. While attempts have been made by other studies on the adoption of PPPs for upscaling airport infrastructure, they have not provided analysis of other options. Beyond the analysis of the ills of China debt we provide PPPs as a desired procurement and financing option for airport infrastructure.

Given that PPPs elsewhere have been a very favorable source of financing, and the reservations regarding the Chinese debt, we examine the possibility that PPPs can be a better option than Chinese loans for financing the Entebbe International Airport (EIA) in Uganda. Thus, the study is guided by the following questions;

i. What is the comparison of using China Debt and PPPs as an airport infrastructure procuring and financing option?
ii. What are the PPP models for airport development and management that could procure and finance the EIA?

To answer these questions, we review the value and risks that the government faces from China debt at EIA. We compare the China debt with PPPs that have been adopted by the government to procure and finance infrastructure. Thereafter, we provide for the working of PPPs in the development of airports in order to learn lessons for the practice of PPPs for airports development and management in Uganda and other countries in Sub-Saharan Africa with debt stress. We acknowledge, however, that while loans are good, they should posit some challenges residing in them or their contexts. We then provide a conclusion and recommendations for the adoption of PPPs as an alternative sustainable option. The section that follows outlines the evolution of China loans to Africa.

Historical perspective and evolution of China loans in Africa

China, like any transition and developed economies has over the years amassed capital, creating a situation of overcapacity resulting from the over-accumulation of profits over the last decade. In an attempt to offload overcapacity from its market, China continues to seek market in developing Asia and Africa to absorb excess capital made in China (Zajontz, 2020). The objectives that have driven this trend include the need to develop an accumulation system that benefits China materially and discursively (Sum, 2019). According to Summers (2016), China's system of accumulation seeks to achieve an agenda of recycling capital in profitable markets while seeking to achieve three key goals, namely; finance, production and security. Existing literature indicates that Asia and African countries have remained key capital destination markets for China in its perceived debt-trap diplomacy (Ofstad & Tjønneland,2019).

In Africa, it is revealed that the 1st loan from China was in Guinea in 1960 (Moss & Rose, 2006; Reisen, 2007). Since that time, China has become a large debt financier in development markets (Moss *et al.*,2006; Reisen, 2007). Since 2016, it is opined that China's loan disbursements to Africa had surged up to USD$132 billion (Alden & Jiang,2019). Another study has put the total figure of loans from China to Africa at USD$148billion for the period 2000 to 2018 (Brautigam, Deborah, Huang, Yufan, Acker & Kevin,2020). While effort has been made to secure such figures, it is acknowledged that getting the nominal values can be quite challenging due to the opaqueness that defines China's global financial transactions (Brautigam, *et al.*,2020; Morris, Parks, Gardner & Parks,2020). This implies that the nominal figure could be even greater than what is provided by existing studies.

The perceived debt-traps notwithstanding, debts from China are believed to have enabled African governments to deliver infrastructure like roads, railways, ports, airports, and services that were either absent, limited or in bad shape. By positioning itself as Africa's new creditor, China's debt presents itchy questions for both the debtor and creditor (Alden *et al.*,2019). While China was welcomed, it seems that its position in providing debt for the development of infrastructure has grown and is currently being abused to create and dictate unfavorable terms.

This paper set out to explore debates on Africa's debt while providing an alternative to China's debt which exposes vulnerability of developing economies' sovereignty in the context of airport infrastructure development and management.

Some observers like Alden *et al* (2019) opined that through debt offloads, China has developed ties with Africa that have resulted in complex relationships. While this view has been held largely in scholarships and geopolitical debates, a positivist view exists. However, the setup of foreign China state-owned and private businesses is recognized for changing Africa's position in the global economy from a consumer to an exporter. Additionally, the China–Africa relationship has been deemed as a medium for securing debt with less conditionalities than the western loans and grants.

Nowadays, the China-Africa relationship that is glued by debt is challenged and surrounded by suspicion (Manji, Manji & Marks, 2007; Manji *et al.*,2007). The suspicion is

based on the paradigm that China seeks to exploit natural resources while rewinding efforts for good governance, democracy and respect for human rights. In fact, China –African relationships sustained by debts to Africa are deemed as a strategy designed and implemented by China in its self-interest to shift global power while reducing the dominance of western power globally. While China has to some extent contributed positively to the African economy in recent years, questions have arisen over the effectiveness of China's debt to Africa. To illuminate the challenge with China's debts in Africa, we discuss in the next session the China debt context in Africa using the example of Entebbe International Airport. This is because Uganda has enjoyed low debt sustainability stress (IMF,2016a:2021b), as shown in table 1,

Table 1: IMF Debt sustainability analysis

Low Risk (08)	Moderate Risk (20)	High Risk(07	In debt distress(02)
• Benin • Ethiopia • Liberia • Nigeria • Rwanda • Senegal • United Republic of Tanzania, • Uganda	• Angola • Burkina Faso, Cabo Verde • Cameroon • Comoros • Congo • Cote de Vorire • DRC • Gambia • Guinea Bissau • Lesotho • Malawi • Mali • Mozambique • Niger • Sirera Leone • South Africa • Togo • Zambia	• Burundi • Central African Republic • Chad • Djibouti • Ghana • Mauritania • Sao Tome and Principe	• Sudan • Zimbabwe

Source: in citation by Onjala (2018) and IMF (2020)

In Table 1, Uganda is cited as having low debt sustainability risk. This is maintained in a recent debt sustainability analysis report by the IMF (2020) and as compiled by Estavao, Fedelino & Lane (2020). However, the pace of debt borrowing as a fraction of GDP is increasing (Ministry of Finance Planning and Economic Development MoFPED,2021). Based on the analysis, there are more African countries in the high risk and in debt distress category than in the low debt distress risk category. While the highest number of countries resides in the moderate debt risk category, the Covid 19 pandemic, sluggish post Covid-19 recovery and Russian Invasion of Ukraine is likely to limit GDP growth, requiring the need for more debt piles. Specifically, in Uganda, emerging trends associated with China debt borrowing of USD$ 200 million under unfavorable terms could put it in a higher risk quartile (Onjala,2018; Wasswa,2022).

High debt stress to China has caused undesirable situations to some countries. For example, due to failure to repay the debt, the government of Sri Lanka ended up granting a

99-year lease for 110 hectares of land to China under the China Merchants Port Holdings with an 80 per cent stake and 15,000 acres of land around it, to be developed as an industrial zone for Chinese investors (Buheria,2018:173). Since this research is anchored on a case study that resides in Uganda, in the next section we provide a discussion of the events at Entebbe International Airport to understand the character of China loan concessions.

Case study: Entebbe International Airport

Entebbe international airport is the gateway to Uganda by air transport. The airport is a major gateway to the world connecting Uganda to its domestic geographies, East Africa and the world. According to UCAA (2015), imports grew at 10% while transit passengers increased by 31.46% in 2015/16 (140,678). Domestic passengers dropped by 18.83% in 2015/16 (14,186) compared to 2014/15 (17,476). Aeronautical revenue was the major contributor in FY2015/16 with a share of 78.53% (UGX154.62Bn). Passenger service charge (UGX85.14Bn) contributed the majority of this revenue during the period. According to the business plan for the EIA under section 2.6.2.2, the government of Uganda acquired long-term debt on favorable terms to support capital-intensive investment at the airport. Among the capital intensive investments includes; a) Expansion and Strengthening of Apron 1 (FY2016/17 – FY2018/19), (b) construction of a new passenger terminal complex (FY2016/17 – FY2020/21), strengthening and widening of runway 17/35 and its associated taxiways (FY2016/17 – FY2018/19, Rehabilitation of Runway 12/30 and Associated Taxiways (FY2016/17 – FY2018/19), strengthening and expansion of apron 4 (FY2016/17 – FY2017/18, replacing the obsolete NAVAIDs and Communication Systems (Commences FY2021/22) and establishment of a new cargo centre complex (FY2015/16 – FY2018/19). (UCAA,2015). The investments are deemed to be anchored on the need to support projected growth in traffic of passengers and cargo at EIA (UCAA,2015). Table 1 provides statistics of forecasts.

Table 1: Traffic Forecasts for 2017 to 2022

Nature of demand traffic	Estimated Forecast across Financial Year (FY)						
	Actual 2015/2016	Estimated 2016/2017	FY2017 / 18	FY2018 / 19	FY2019 / 20	FY2020 / 21	FY2021 / 22
International passengers	1,363,484	1,465,745	1,575,676	1,693,852	1,820,891	1,957,458	2,104,267
Domestic passengers	14,186	14,895	15,342	15,802	16,276	16,765	17,268
Imports	21,490	22,135	23,241	24,404	25,624	26,905	28,250
Exports	35,076	36,128	39,741	43,715	48,087	52,895	58,185
Overflights	14,394	15,546	16,012	16,492	16,987	17,497	18,022
Commercial flights	28,334	29,184	30,060	30,890	31,890	32847	33,852

Source: UCAA (2016)

Based on the forecasts in Table 1, it was anticipated that air traffic would increase and it did despite the global shocks such as the Covid-19 and the Russia Invasion of Ukraine. To serve this demand in line with UCAA's dream to improve airport infrastructure in Uganda, the Government of Uganda under the Ministry of Finance, it had been planned to borrow a

loan of USD$ 200 million from the China Exim Bank to support the expansion of Entebbe International airport (EIA). The expansion was to include rehabilitation of the airport parking apron and aircraft parking apron. It is documented that UCAA, through the Ministry of Finance Planning and Economic Development MoFPED, obtained a long term concessional loan, with favorable terms, to procure and finance the capital intensive airport infrastructure projects at EIA (UCAA,2016:74).

A recent scrutiny of the loan agreement by the Committee on Commissions, Statutory Authorities and State Enterprises (COSASE), reveals that Uganda borrowed USD$ 200 million with unfavorable terms from China Exim Bank (Onjala,2018; Wasswa,2022). While it is expected that loan money must attract interest estimated at UGX 11.5billion (USD$1.194million) based on the exchange rate provided in the Business plan (UCAA,2016), it is reported that some of the terms of the loan agreement, contravene what is deemed favorable terms for citizens. The unfavorable terms include

a) A requirement to open up an escrow account where all UCAA revenues were to be deposited and the financier retains powers to approve all expenditures
b) Approval of budgets by China Exim Bank
c) Imposition of loan Chinese jurisdiction on loan recovery mechanism and arbitration, and;
d) Waiver of international immunity for Uganda

Based on the above terms, this investigation was motivated to explore whether there exist alternative financing options that would provide better terms and comfort for airport infrastructure development. A preliminary review of literature indicates that airports are largely national assets and can be procured and financed through budgetary allocation, debt, bond finance, and project financing including PPPs. We find that pursuit of budgetary allocation was largely going to impact on the country's debt to GDP ratio that is currently getting out of shape since debt as a proportion of GDP is exceeding the recommended 50:50 ratios (WB, 2015). Bond markets remain weak in Uganda and largely in many developing countries. We find that PPPs could be a very appropriate option and thus we recommended financing remedy for such project undertaking.

Firstly, public-private partnerships are acceptable for developing infrastructure and services in Uganda (GoU, 2010:2015; 2019. A policy, legal and regulatory framework exists in Uganda for the adoption of PPPs (GoU,2015; GoU,2015; GoU,2019). Secondly, studies (Sgur,2021) indicate that PPPs have been tested for adoption in expanding, rehabilitating, managing and installing airport infrastructure across the world. In more developed countries, it is widely known that PPPs have been adopted for airport infrastructure across countries like the United Kingdom, Spain, Portugal, New Zealand, Peru, Italy and Japan. Transiting economies like Brazil and South Africa have also been recognized for the adopting PPPs in the aviation sector (Soliño & Vassallo,2009; Sambrani,2014; Engel, Fischer & Galetovic, 2018; Farrell & Vanelslander, 2015; Sengur,2020: Cruz & Sarmento, 2022).

PPPs in the East African aviation sector where Entebbe International Airport domiciled

are now adopted as a procurement and policy instrument to develop and enhance airport infrastructure. For example, in Rwanda PPPs are adopted for the construction of Bugesera International Airport, whereas in Tanzania, the Tanzania Airports Authority made a decision to procure a four-star hotel and expand an apron at Julius Nyerere International Airport Dar-es –Salam (TAA, 2022). While studies on the earlier experience of the adoption of PPPs for airport infrastructure development in East Africa remain scarce and perhaps too early to judge, experience elsewhere on the use of PPPs for infrastructure indicates that some benefits have been achieved (Sambrani,2014; Cruz *et al.*,2022).

Methods and Materials

This investigation adopted conceptual abstraction to collect and analyze data. According to Olsen (2002), Villani et al., (2019), conceptual abstraction is the discussion of concepts with the aim of directing attention in academic circles and research puzzles. Previous studies indicate that conceptual abstraction has been applied in political studies and public administration (Batini, Comerio & Viscusi ,2012; Janowski, Pardo & Davies,2012; Jreisat,2018).

In this study, we adopt conceptual abstraction because it explains and can guide the generation of cures to decision pitfalls and mistakes (Majone 2005; Brady and Collier 2004) which were done by the government of Uganda in pursuit of the China debt. We analyzed existing data on the concessional terms for the financing of EIA, public-private partnerships for airports and models for adoption of PPPs. Secondly, we deductively conceptualize the general context and character of China debts in Africa using the Entebbe International Airport as the unit of analysis.

We drew on secondary data such as official documents, scholarly publications and media reports to draw conclusions on the context of financing infrastructure in the transport sector, and risks associated with financing airport infrastructure using China debt. This enabled us to have a wider understanding of China debt, its potential risks and benefits for Africa which gave us ground to explore PPPs as the next possible alternative. To eliminate bias in the case study associated with the Western World and China geopolitics, we reviewed literature on China's debt finance in Africa using studies in China and the entire world.

Results & discussion

To generate policy insights on the applicability of the feasibility of China debt and PPPs as financing options, we start by giving a background on the PPPs as an airport infrastructure financing option. We provide insights on the trends and the background of PPPs in the aviation sector. The results are discussed in chronological order of the research questions as subsections; 1) what is the comparison of using China Debt and PPPs as an airport infrastructure financing option and, 2) what are the PPP models for airport development and management?

Public Private Partnerships and Airports

According to Engel, Fischer and Galetovic (2020) public private partnerships are concessions between the public and private actors for the delivery of public services. In another study, PPPs are viewed as an alternative financing option used by the government to procure and finance public infrastructure investment (Yurdakul, Kamaşak & Öztürk, 2022; Hodge and Greve 2006). The World Bank (2019) defines a long- term contract between a private party and a government entity as a public asset or service in which the private party bears significant risk and management responsibility and remuneration is linked to performance.

Arguably, PPPs have been adopted as a means to improve policy outcomes and develop infrastructure across the social, infrastructure and health sectors in many countries (Weihe,2006). Klijn (2010) asserts that PPPs have been adopted by governments starting in the 1980s as part of the new public management agenda. NPM as a public sector reform seeks to adopt market-based practices and principles to improve public administration while delivering effective and efficient outcomes. While the concept of NPM has been widely critiqued for having no place in public administration, its strategies like PPPs have remained popular and widely adopted across the world (Castelblanco, Guevara, Mesa & Sanchez,2021). Callens, Verhoest & Boon, 2022), because they deliver better on time and cost outcomes (Verweij & van Meerkerk, 2021).

An empirical study by Nduhura (2019) in the energy sector indicates that PPPs reside with a potential to support governments in delivering services much earlier. In other studies, PPPs have been adopted for their ability to procure, finance and shift debt off national balance sheets (Hodge & Greve, 2021). The proponents of the economic benefits argue that while PPPs may not provide immediate financial benefits, they provide services like increased quantity and quality of the electricity, transport, education, health services provided by PPPs deliver spiral effects that can help to jumpstart other sectors of the economy. Traditionally, the adoption of PPPs as a mode of governing airports can be traced to the days of Reagan and Thatcher's government (Ishihara,2021; Gomes & Lisboa, 2021; Zaki & George, 2022), where government reformists sought to deliver efficient and efficient service across all spectrums of government including the management of airports and airlines.

Trends in the aviation sector play an important role in understanding the context within which PPPs have been adopted in the development and management of airport infrastructure (Graham, 2019). Findings from a study by Omid, Rouhani, Oliver Gao and Richard Geddes (2015) indicate that traditionally, procuring and financing airport infrastructure was a mandate of the government. However, the reformist agenda buoyed by Margaret Thatcher's government resulted in a dramatic shift in the development and management of infrastructure under the new invention of New Public Management (NPM).

Under the NPM philosophy, pressure to transform public administration and generally government resulted in the need to pull back the hands of public administration in the management of public affairs and operations.

This was because public administration was viewed to be unnecessarily bureaucratic, slow, inefficient and ineffective. Inadvertently, it is argued that sharp declines of funding sources for infrastructural development including airports, have required that governments rethink their funding options (Omid, *et al*.,2015). While China debt has been discussed, we now discuss PPPs before we proceed with comparing their use as financing options for airport infrastructure.

Beginning in the United Kingdom's debate to privatize British Airways and airports like Gatwick and Heathrow, the debate to liberalize and attract private investment through PPPs has dominated aviation practice and academia across the worldwide and for quite some time.

While the business of national airlines is quite known, airport management is seldom known and discussed. According to Cruz and Marques (2010), airports constitute two subsystems, namely; air side and landside. The airside consists of taxiways, runways and parking stands while the land side consists of terminal buildings, shopping facilities, hotel services, shopping including duty free shopping space, vehicle parking, kids play area, executive waiting lounges. While the airside system has remained under the monopoly of government, the land side has been left under a marketization system, with private operators. Therefore, it is usually the airside system that tends to attract private sector involvement through PPPs models (Cruz *et al*,2010) but has also attracted China debt (UCAA,2015). Both systems have over the recent years traditionally attracted budgetary allocations as a major means of financing, other financing options have taken up the cardinal financing option.

In Uganda, due to budget constraints, civil aviation infrastructure has either remained dilapidated or insufficient to meet rising demands evidenced by throughput and travel times across airports in the developed, transitioning and developing countries. The demand for air traffic growth has been due to a range of factors. Liberalization, route competition and hub choice competition to attract airline operator portfolios (Schulte,2009). It is further opined that airports are looking at diversifying their revenue models to include aeronautical charges to now parking, real estate and retailing (Schulte,2009).

Such trends have required that governments rehabilitate, develop and improve the capacity, aesthetics of airports to stay ahead of the competition and create hubs with high potential to attract transfer traffic. Infact such trends have necessitated that airport infrastructure is expanded and rehabilitated to meet not only the flows of passengers but the aesthetics of an airport. Historically, airport transport has been deemed the safest mode of transport. While air transport is acknowledged for being safe, it is also acknowledged for being the most expensive transport mode. Building the necessary safety character for airports, has come with the need for enormous investment. Key areas of investments have included, hangars, aprons, run - ways and other furniture like waiting lounges, retail shops, parking space for drop off and long stay passengers.

Recently, public calls for airport investment in countries like Tanzania indicate that amenities like hotels, commercial complex and associated facilities are considered as key components of airport infrastructure (Tanzania Airports Authority, 2022). Considering that

airport infrastructure development involves extremely long lead time in terms of planning, financing and construction, it is essential that airports keep investing to meet the future needs of airlines and passengers (Airbus,2015; UCAA,2016; UCAA,2016). This argument has been based on forecasts that indicate inward shift in demand for airport clients. For instance, 20 year forecast by Airbus (2015) indicates that global average traffic for air travelers shall increase by 4.5% with some countries like Turkey achieving an average growth of passenger traffic at a rate of 10% by 2030. In East Africa, airport traffic despite the interruptions with Covid 19 is likely to increase (International Air Transport Association IATA,2021) as the world gets back to normal.

To seize the value that resides with the forecasted flow of passengers and cargo, governments worldwide have set out to invest in expanding and rehabilitating their airport service infrastructure. In Africa, governments are keen on growing airports and their infrastructure using traditional and conventional financing options (budget allocations) which are under pressure and no longer sufficient to serve aviation needs. Next, we compare the use of China debt and Public-private partnerships as alternative financing options for the Entebbe International Airport Infrastructure.

Comparison of Use of China Debt Versus Public-Private Partnerships to procure and finance airport infrastructure

Although governments worldwide procure and finance infrastructural development using budgetary allocations, most African governments are now opting for China's debt to procure and finance airports and seaports (Brautingam,2020). Our choice for the review is informed by the increasing trend of adopting PPPs to procure and finance airport infrastructure. In the table 2 below, we compare and contrast PPPs and China debt as procurement and financing options for EIA that has chosen to adopt China debt for airport infrastructure.

Table 2: China Debt Versus Public Private Partnerships to procure and finance airport infrastructure

China debt		Public-Private Partnerships	
Advantages	**Disadvantages**	**Advantages**	**Disadvantages**
Limited restrictions and conditionalities of loan	Legal jurisdiction foreign law applicable, the China national law	The legal and regulatory framework requires that spv is registered in execution country and governance of PPP and special purpose vehicle (spv) by local laws (GoU, 2015)	Information asymmetry (Nduhura,2019)
Willingness to reschedule debt and thus no evidence for asset seizures (Morris, Parker, Gardner & Park,2020; Braugutingam, 2020)	Sovereignty; limited due to waiver of international immunity (Behuria, 2018).	Sovereignty is guaranteed since the country or its assets are not concessioned / collateralized.	Unrealistic/ poor forecasts can transfer avoidable demand guarantees fines to the government (Sengur, 2021).

China debt		Public-Private Partnerships	
Advantages	**Disadvantages**	**Advantages**	**Disadvantages**
		Government can support the private actor to renegotiate loan tenure (Nduhura, 2019)	
The market for Africa for example 28% of imports of gas and oil (Braugutingam, 2020)	Approval of budgets; approval of budgets by China Exim Bank and not the borrower (Wasswa, 2022).	Escrow accounts are governed by the contracting authority (borrower) and not the lender or its associates (Srivastava, 2017).	
Using China loans Africa is and has built roads ,airports & electricity,infrastructure (Braugutigam, Huang & Acker, 2020)	Usually, tagged to a Chinese firm for execution of a project benefitting from the loan (Wasswa, 2022)	Using PPPs, Africa has built roads, airports, hospitals, electricity dams, and distributed electricity (Kabanda, 2015).	
Attractive concessional terms better than in the lending marking (low interest rates, long maturities, and extended grace periods) [2% interest rate, 6-year grace periods, and 20-year maturities] reduces the likelihood of a debt crisis in borrower counties(Morris *et al.*, 2020)	Beneficiaries of contracts are usually foreign China backed state owned enterprises in the borrower's country (SOEs) (Zajontz,2020).	Contingent liabilities exist for deemed demand, political risks, industrial risk, early termination	Private investors do not take projects with negative Net Present Value, yet would be required by citizen (Cruz *et al.*,2010)
Interests free loans as part of global aid program (Brautigam *et al.*, 2020)	Loans signed are not usually fully dispersed and disbursement period , averaging 5 years and more for larger projects (Braugutigam *et al*,. 2020)	Liabilities off balance sheet of government (Cruz *et al.*,2010)	Allows some economically unviable projects to proceed (Cruz *et al.*, 2010)
	Lack of transparency; confidentiality requirements have made it difficult to undertake any deeper analysis of lending terms (Brautigam, Deborah,Hwang, Jyhjong, 2016; Morris *et al.*,2020; Strange, Dreher, Fuchs, Parks, & Tierney (2017).	Resides with the benefit of bringing infrastructure competition (Demsetz,1968)	In Africa, clauses and contracts remain confidential and restricted
	There is a strong requirement that a Chinese enterprise be selected as the contractor (Onjala,2018)		No requirement to select a bidder based on dictation of funders, source of materials for project development. Interest and loan repayments by private parties can be flexed with government guarantees and negotiations (Nduhura, 2019).

China debt		Public-Private Partnerships	
Advantages	**Disadvantages**	**Advantages**	**Disadvantages**
	There is tying of loans so that at least 50% of the equipment, materials, services or technology needed to implement the project are to be secured from China (Onjala,2018).		
	Smaller grant element compared to World Bank (23% versus 35%) (Zajontz,2020)		
	Shorter repayment period periods compared to World Bank (10-15years versus 20 to 50 years) (Zajontz,2020;6)		
	Overpriced to compensate generous terms if the net present value is discounted (Zajontz,2020)		

Source: Authors conceptualization based on review of literature

In table 2, a comparative analysis of the advantages and disadvantages of China debt and PPPs as infrastructural financing options has been undertaken.

From the analysis, we deduce that African countries have found it much easier to get money from China compared to Western sources. This has been due to limited conditionalities. According to Dreher, Fuchs, Parks, Strange & Tierney (2018) Zajontz (2020) Western development project finance is not tied to the protection of human rights, environment, democracy and rule of law. Findings further reveal additional perceived advantages for the use of China sourced loans compared to the use of PPPs and debt finance from the Western World.

From the summary of advantages and disadvantages on the use of China development finance to finance infrastructure, in table 2, we find that the China debt like other sources of finance have had some benefits but pose risks for African governments. This is due to short term loans, lack of transparency, shorter payback period. In some cases, it is revealed that loans may take up to 5 years to be fully dispersed, posit a small grant element and the conditionality of having a Chinese contractor to execute a contract financed by the loan. Other risks cited in literature is a requirement that escrow accounts created and approvals of expenses and revenue by the financier. An escrow account in this context, refers to a lender controlled revenue account (Gelpern, Horn, Morris, Parks & Trebesch,2021).

Additionally, a waiver of international immunity for the country in default if loan requirements are breached. Also it is opined that a requirement that natural resources in addition or other than asset or infrastructure financed be used in addition to recover the loan disbursed.

The confidential nature of clauses of financing agreements, policy influence and seniority used by financing agreements puts the borrower in a long tenure subordinate position. In addition, it is revealed that unrealistic forecasts by the state may attract transfers worth millions to the private actor. This is because the project size, costs and revenues, return on investment

are calculated based on forecasted revenue. For example, in a study by Sengur (2021).

It has been opined that when the borrower fails to pay, they can be interfaced with serious consequences. For instance, Behuria (2018) reveals that when the government of Sri Lanka failed to pay a debt acquired for financing sea port infrastructure.

Despite these constraints there exists the adoption of the use of PPPs to develop the airport and other infrastructures in Africa and Uganda. In table 2, we compared the China debt with PPPs. We find that PPPs are advantageous because they may provide a longer tenure of up to 50 years for the government to pay back the investment or through availability payments or guarantee the payment of user fees.

We also find that while loans are involved in PPPs transactions, loans are on the balance sheet of the private actor since it's the private actor that borrows as the government provides only guarantees as cushions of comfort for lenders.

Notwithstanding when the private actor defaults or in cases of early termination, the government will usually take over the assets and liabilities of the private actor. This implies that the government must safeguard against early termination if they are to sustainability reduce the risk of taking over third-party liabilities. Unlike China debt, it is also revealed that with PPP, there resides a requirement that bidders register a special purpose vehicle / special purpose company (local indigenous firm) made up of a firm(s) that won the PPP bid. Once registered the SPV/C is bound by the laws of the domestic government in which the PPP project is being executed. Compared to the China debt that provides for China's legal jurisdiction, PPPs therefore provide the host government with higher predictability of legal outcome in cases disputes between the public and private actors are escalated to courts of laws. Additionally, while the private actor is given land leases to enable them to secure additional funding at financial closure and afterwards, we conclude that these are guarantees of softer tone when compared to collaboration and collatorization of natural resources with China Debt that puts a borrower's sovereignty in jeopardy in the event of a dispute(Behuria,2018). The sweetness of China loans arises when China financiers have like the World Bank have in some instances waived debt and interest obligations (Cheelo, Hinefelaar & Ndulo,2020). Such trends may perhaps may influence the choice of China debt as a favorite path over PPPs. However, it is important to note that waver is only at the discretion of the financier and not part of the agreement. Therefore, the use of this excuse to pursue China's debt instead of adopting PPPs may be perceived as an unsustainable and misguided decision. There the adoption of PPPs to finance airport infrastructure may be considered based on the benefits they provide. While PPPs may be adopted, knowing how they can be structured and implemented in the aviation sector is important.

In the next session, we identify, discuss, and analyze the working of PPPs for airport development and management.

Models for PPPs for airport infrastructure development and management

Cruz *et al., (*2010) argues that the adoption of PPPs in aviation commenced with the privatization model. Under privatization, private actors take full ownership and control of airports, airlines and aviation infrastructure using a divestiture model that assumes "complete transfer of assets to the private actor from the public actors". This was followed with PPPs core model such as the institutional and contract models. Institutional models include the state and private actors as equity partners while with the contract model, the private actors(s) become exclusive equity investors leaving the state as roles of a client under agencification type of relationship and regulator. The examples of contractual PPP models include; outsourcing/subcontracting, leasing also known as "affermage", management concession, build own operate (BOO) and Build Own Operate Transfer (BOOT) (Cruz *et al.*, 2011:5). In other cases, a generalized approach for models has been adopted, namely, institutionalized or contract and or both. While PPPs have delivered to some extent, they have been critiqued. Hodge *et al* (2021) indicates that PPPs tend to borrow at 1.5% to 4% higher interest rates than governments. De Bettignies and Ross (2004) and Burgess & Zerbe (2011) indicate that PPPs have higher default risk debt payments unlike the government as a borrower that posits lower default risk since loan repayments are guaranteed by taxes. In Table 3, we summarize the PPP models used at different airports and airports across the world. Thereafter, we provide for a discussion of the structure and experiences of implementation of PPPs across airports in Africa.

Table 3: Examples of PPPs models adopted for airport in developed, transitioning and developing countries

Name of Airport	Model Of PPPS	Country	Structure of PPPS	Author
Newcastle	Institution-alized	United Kingdom	The company structure of Newcastle International Airport results from an agreement by the airport's seven local authority shareholders to enter into a PPP arrangement with Copenhagen Airports in May 2001. The local authority shareholders sold 49% of their shares to Copenhagen Airports and the Company has entered into a 15- year Technical Services Agreement with Copenhagen Airports	Cruz *et al.*,.2011:11)
Norwich	Institution-alized	United Kingdom	Norwich International Airport is owned 80.1% by Omniport (a private investor) and the remaining shares belong to Norwich City and County Council.	Cruz *et al.*,.2011:11)
Madrid-Barajas International Airport	Contrac-tual	Madrid	Operate and maintain: expand the subway network to the new Terminal T-4in Madrid-Barajas International Airport	Soliño, & Vassallo, (2009).

Name of Airport	Model Of PPPS	Country	Structure of PPPS	Author
Marseille Provence	Contrac-tual	France	The Airport is owned by the Marseille Provence Chamber of Commerce and Industry (CCI) that has managed the airport since 1934. Renewed in 1987 for 30 years).	Cruz *et al.*,.2011:11)
Nice & Cannes	Institution-alized	France	*The Aéroports de la Côte d'Azur is owned by the State (60%), the French Riviera Chamber of Commerce (25%), and 15% distributed equally between Region of Provence Alpes Côte d' Azur, Alpes-Maritimes Regional Councils and Urban Community of Nice*	Cruz *et al.*,.2011:11)
Bugesera International Airport	Contrac-tual	Rwanda	The government of Rwanda concessioned the airport under a build Own operate and Transfer arrangement for 25year with Qatar overseas development Company. Construction of International Airport-terminals, runway, hangers, aprons, parking spaces, commercial retail shops (green field)	Settumba, Nduhura, Nuwagaba Molokwane & Tshombe (2021)
Austrian airport operator of Vienna, Flughafen Wien AG	Institution-alized	Austria	Airport was privatized in 1992, and nowadays 50% of shares are in the hands of private shareholders, while the other 50% are divided between the province of Lower Austria (20%), city of Vienna (20%), and a private employee participation foundation (10%)	Cruz *et al.*,.2011:11)
Mwalimu Julius Nyerere International Airport	Contrac-tual	Tanzania	FBOOT: 4 star hotel ,construction of aprons	Tanzania Airports Authority (2022)

Name of Airport	Model Of PPPS	Country	Structure of PPPS	Author
Burgas	Contractual	Bulgaria	Fraport Twin Star Airport Management: At the end of year 2006 the German-Bulgarian consortium of the worldwide famous airport operator Fraport AG and the Bulgarian logistic company BM Star won the competition for the concession of Varna and Burgas airports – the air gateways to the popular Bulgarian Black Sea tourist region. During the 35-year concession period Fraport Twin Star Airport Management will operate and invest in the development of both costal airports. Concession contracts were signed in 2005 before the beginning of the busy summer season. The 35-year contract will have an option for a 15-year extension.	Cruz et al.,.2011:11)
Varna	Contractual	Bulgaria		
Berlin Brandenburg	Contractual	Germany	Concession was signed, for 99 years, for Berlin-Brandenburg new airport. The winning bid belongs to IVG Holding and Hochtief Airport, together in a consortium called Berlin-Brandenburg International Partner. In this greenfield project, the government role was to resettle the population in two small villages (Diepensee and Selchow) and build rail and road infrastructures.	Cruz *et al.*,.2011:14)
Frankfurt	Institutionalized	Germany	In Frankfurt's main airport, the manager/operator is Fraport, hold by the State of Hesse (31.52%), the city of Frankfurt (20.13%), and private corporations like Artio Global Investors (10.35%), Deutsche Lufthansa AG (5.01%), Taube Hodson Stonex Partners (3.59%), Arnhold and S. Bleichroeder Holdings, Inc. (2.98%) and Morgan Stanley (2.94%). 18.59% are in the hands of anonymous shareholders	Cruz *et al.*,.2011:14)

Name of Airport	Model Of PPPS	Country	Structure of PPPS	Author
El Loa Airport	Contract	Chile	A major extension of El Loa Airport in northern Chile was tendered as a PPP by the Ministry of Public Works in January, 2011, after the expiration of the first PPP contract. The El Loa airport serves about 1.2 million passengers a year. The project considered 8.100 m2 of new terminal space for shops and other ancillary businesses. Nonetheless, the winning firm concluded that the optimal increase in commercial space required an additional 2.000 m2. The concessionaire obtained permission from the ministry to build a larger terminal. According to the concessionaire, the enlargement of the commercial area played a major role in the high profits reported by the concession during 2014, its first year of operation.	Engel *et al.,(*2018)
Beijing International Airport Toll Express Highway	Contract	China	the Beijing International Airport Toll Express Highway, a PPP (concession) project	Zhang, Gao, Feng, & Sun (2015)
Perth Airport,	Contract	Australia	Build Operate Transfer (BOT), Rehabilitate Build Operate Transfer (RBOT)	Tomová (2009)
Santiago International Airport	Contract	Chile	Build Operate Transfer (BOT), Rehabilitate Build Operate Transfer (RBOT)	Tomová (2009)
El Dorado International Airport	Contract	Columbia	Build Operate Transfer (BOT), Rehabilitate Build Operate Transfer (RBOT)	Tomová (2009)
Mwalimu Julius Nyerere International Airport	Contract	Tanzania	Design-Build-Finance-Operate–Maintain and Transfer (DBFOMT) of commercial complex and associated facilities	Tanzania Aviation Authority TAA(2022)
Jomo Kenyatta International Airport	Contract	Kenya	Build Own Operate Transfer	Kenya Airports Authority (KAA) (2021)
General	Institution-alized / Contract	General	affermage", management concession, build own operate (BOO) and Build Own Operate Transfer (BOOT)	(Cruz *et al.*, 2011:5).

Source: Authors conceptualization from review of literature (2022)

The analysis in table 3, indicates that PPPs have been adopted across the world (Cruz *et al*.,2011; Emek,2015; Settumba *et al.*,2021). The choice for PPPs in airport management has largely been to reduce the pathologies of public administration, improve revenue and infrastructure, while gaining access to private finance (Sengur,2015).

It is important to note that PPPs can be adopted using two systems; the institutionalized model and the contractual model (Cruz *et al.*,2011). Using the institutionalized model involves equity sharing of a management company between the public and private actors. While a contractual PPP is where the airport management company is owned by the private actor without equity stakes by the government (Cruz *et al.*,2011; Cruz & Sarmento,2022). Studies indicate that non-aeronautical packages tend to provide higher revenue streams and higher revenue growth potential in Asia, US and Europe but lower revenues in Africa. This is explained by the fact that most Civil Aviation Authorities in Africa still man the aeronautical and may not in most cases reflect revenues generated in their accountability frameworks(Graham,2009). Since PPP investors rely on facts to commit their investment, non-aeronautical infrastructure is likely to be attractive for private actors. Among the contract forms of PPPs includes; Build Own Operate(BOT), Rehabilitate, Build Operate and Transfer(RBOT), management contracts and outsourcing.

The Build Own Operate(BOT) is one of the most popular models applied to the development and management of airport infrastructure. Under the BOT arrangements, the private sector is responsible for providing the service, financing the investments required. At the end of the concession, the assets installed are transferred to the government. This model has been applied in handing over airports in Spain and Turkey (Ülkü, 2015).

Another model adopted for airport PPP has been the Rehabilitate, Build, Operate and Transfer (RBOT) (Tomová ,2009; Zhang, Gao, Feng, & Sun ,2015). The model operates the same way as the BOT. The main differentiator is that RBOT constitutes of green field (installing new assets) and a brownfield (rehabilitating assets) after an agreed period of years, usually 15 to 30 years.

Management contracts are also a popular PPP contract type. Under a management contract the private sector manages the service for the "owner" based on pre-determined and agreed targets (Cruz & Marques, 2011). For instance, ground handling services, catering, and asset maintenance contracts may be signed off between the public and private sector actors under this arrangement.

In Tanzania, the government under the Tanzania Aviation Authority (2022) is adopting the Design-Build-Finance-Operate–Maintain and Transfer (DBFOMT) to develop a Commercial Complex and associated facilities at Julius Nyerere International Airport. Studies by Nduhura (2019), Molokwane, Nduhura, Tshombe and Nyongarwizi (2021) propose the Design Build Own Operate Transfer (DBOOT) model for adoption by governments to reduce design risks. While the DBFOMT has similarities with BOT/BOOT, the private actor assumes design risks. The idea to combine design with other functions is supported by evidence that when design is combined with the build function, projects have greater chance to complete ahead

of time at reduced design related costs (Hale et al., 2009; Tran, Molenaar & Gransberg, 2016; Lichtig,Holland & Allen, 2005; Park & Kwak,2017: Tran, Diraviam & Minchin Jr, 2018). It is envisaged that the private actor should be able to install that will improve government revenue, increase customers and create job opportunities (TAA,2022).

Conclusion

While attempts have been made by other studies on the adoption of PPPs for upscaling airport infrastructure, they have not provided analysis of other options like China debt before arriving at conclusion of the call for adoption of PPPs. Beyond the analysis of the ills of China debt, we provide PPPs as a desired procurement and financing option for airport infrastructure.

Drawing on existing studies, the study concurs with existing studies that while China debt has enabled countries to close infrastructural gaps including the enhancement of airport infrastructure, it may not be the best option. China debt should be used as a last resort because of sovereignty insecurities, financier controlled escrow account restrictions, short tenure of debt compared with other lenders like World Bank, IFC, waivers of international immunity, opaqueness of dealings and conditionalities related to governance, democracy, and human rights.

We advocate for the adoption of PPPs for airport infrastructure development and management because PPPs do mildly expose the government to debt, give more power to the government to control the private actor, do not come with strings attached that may compromise quality. Additionally, evidence indicates that PPPs have delivered at airports with limited challenges compared to other sectors such as energy and others. The study has found that BOT and LBOT, Operate and Maintain (OM) are popular models that have delivered quite well in the context of PPPs at airports.

While PPPs have some limitations, this study recommends a transparent bidding process, and developing capacity of bureaucrats to handle PPP negotiations. The success of PPPs depends on macro-economic and political stability. Therefore, governments must invest in policies that seek to develop macro-economic stability and promote democracy. Other factors like security, demand and revenue may as well be considered in deciding whether to deploy PPPs for aeronautical or non-aeronautical systems.

As much as the study was scoped on PPP for airports, exogenous demand triggers (incentive for PPI for airports) have the opportunity to be concessioned under PPPs. For instance, express by pass roads, train metros, hotel accommodation near or within airports provide additional opportunities for the engagement of private actors under PPP triggers. Depending on market outlook and capacity of investors, such triggers can be packaged as additional PPP pipeline projects or packaged as part of the entire PPP project that include mainstream aeronautical and non-aeronautical packages.

PPPs are recommended because airports like EIA are experiencing and have high prospects for growth. Evidence further reveals that the non-aeronautical infrastructure for EIA

and other airports tend to make even more revenue than national airlines. Therefore, since numbers define revenue, and that revenue defines the attractiveness of any investment, the adoption of PPPs for EIA and other airports is justified.

Non aeronautical infrastructural requirements provide higher revenue and exhibit higher revenue growth potential (Graham,2009; Puls & Lentz ,2018); Shin & Roh,2019). Mohamed & Eljalil,2021). Therefore, to engage PPPs, governments should consider Non aeronautical infrastructure development for services such as land composed of terminal buildings, shopping facilities, hotel services, shopping space, vehicle parking, children's play area and executive waiting lounges.

PPPs have been critiqued for putting private actor interests above public interests. To navigate this problem, it is important that the fees charged by the special purpose vehicle are regulated by the Civil Aviation Authorities. Additionally, information asymmetry can be managed by developing the capacity of negotiation and supervision teams. An incentive framework that recognizes and rewards superior performance should be developed.

Study limitations and future studies

The study would have compared implications of debt default of China debt with Western Debt contracts. However, due to increased appetite for China debt due to lack of preconditions we only reviewed China debt implications against PPPs as an alternative. Future studies should focus on undertaking a comparative analysis of both China and Western debt options.

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