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The role of foreign aid in the nexus between capital flight and unemployment in sub-Saharan Africa

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The role of foreign aid in the nexus between capital flight and unemployment in sub-Saharan Africa

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Research Department

The role of foreign aid in the nexus between capital flight and unemployment in sub-Saharan Africa**Simplice Asongu & Nicholas M. Odhiambo****Abstract**

This study assesses the relevance of foreign aid in the incidence of capital flight on unemployment in 20 countries in sub-Saharan Africa. The study is for the period 1996-2018, and the empirical evidence is based on interactive quantile regressions in order to assess the nexuses throughout the conditional distribution of the unemployment outcome variable. From the findings, capital flight has a positive unconditional incidence on unemployment, while foreign aid dampens the underlying positive unconditional nexus. Moreover, in order for the positive incidence of capital flight to be completely dampened, foreign aid thresholds of 2.230 and 3.964 (% of GDP) are needed at the 10th and 25th quantiles, respectively, of the conditional distribution of unemployment. It follows that the relevance of foreign aid in crowding out the unfavorable incidence of capital flight on unemployment is significantly apparent only in bottom quantiles or countries with below-median levels of unemployment. Policy implications are discussed. The study complements the extant literature by assessing the importance of development assistance in how capital flight affects unemployment in sub-Saharan Africa.

Keywords: foreign aid; capital flight; unemployment; Sub-Saharan Africa

JEL Classification: C50; D74; F23; N40; O55

1. Introduction

Some of the major challenges affecting economic development in sub-Saharan Africa are capital flight and unemployment (Boyce & Ndikumana, 2022). The former is understood in the form of an outflow of assets or capital that prevents the region from the economic development it deserves, especially as it pertains to using the corresponding capital to address socio-economic issues such as high unemployment (Agyeman *et al.*, 2022). The latter, or unemployment, can lead to social unrest, such as the 2011 Arab Spring (Asongu & Nwachukwu, 2016a). It follows that with capital flight, possibilities of investing in sectors that can fight unemployment are limited and hence, preventing capital flight provides financial possibilities by which to fund economic activities that ultimately engender employment opportunities. The importance of foreign aid in providing complementary funding opportunities the sub-region remains widely debated (Pickbourn *et al.*, 2022). This study is motivated by three fundamental factors in the policy and scholarly contemporary Africa-centric literature, notably: (i) increasing capital flight levels. (ii) The debate on the relevance of foreign aid. (iii) Gaps in the attendant literature. These three motivational factors are expanded in the same order as highlighted.

First, consistent with contemporary capital flight literature focusing on the African continent, over the past decades (precisely between 1970 and 2010), about 33 countries in the sub-Saharan African region lost about 814 billion US Dollars (in constant of 2010 US Dollars) (Asongu *et al.*, 2022). The narrative maintains that the underlying amount lost to capital flight is higher than attendant external flows such as foreign direct investment (FDI) and foreign aid obtained during the same period, which stood at 659 billion USD (Asongu *et al.*, 2022). This is consistent with the stream of literature that capital flight has been one of the principal causes of the comparative less economic development in the continent in general and sub-Saharan Africa in particular (Ngono, 2022; Agyeman *et al.*, 2022). This is against the backdrop of the role of foreign aid in the development of the continent, which remains a highly debated topic.

Second, the literature on the relevance of foreign aid in development outcomes has largely been oriented along three main tendencies, *inter alia*: (i) the nexus between development assistance and economic development. (ii) Assessment of the concern as to whether foreign aid can be employed to transform institutions in recipient countries. (iii) Strategies that can be used by donor agencies and more technically advanced countries in order to use foreign aid as a means by which institutions and economic development can be improved in the recipient nations (Asongu, 2015; Asatullaeva *et al.*, 2021).

What is apparent from the attendant literature is that the present exposition is premised both on the second and third strands of the foreign aid debate. With respect to the second strand, it focuses on how foreign aid can be employed to influence a development outcome in SSA. With regard to the third strand, the empirical strategy is tailored such that there is an assessment of how foreign aid can be employed as a moderating variable in the nexus between capital flight and employment in SSA. In essence, the study is oriented such that thresholds of foreign aid that are needed in favourably influencing the nexus between capital flight and employment are provided. It is worthwhile to note that, as discussed in Section 2, there is an underlying assumption that capital flight is detrimental to employment prospects in the sub-region while foreign aid mitigates the positive incidence of capital flight on unemployment. It is also assumed that there are critical levels of foreign aid that are needed in order for the positive incidence of capital flight on unemployment to be completely mitigated. Accordingly, above the critical levels or thresholds of foreign aid, the positive incidence of capital flight on unemployment is no longer apparent.

Considering the above, granting that the intuition for the present study withstands empirical scrutiny, the policy importance of this study is based on the perspective that the negative consequence of capital flight in SSA, especially as it pertains to employment opportunities can be offset by some critical levels of foreign aid. It is also worthwhile to note that this policy prescription is not a call for the promotion of foreign aid in exchange for capital flight. On the contrary, it can also be seen as a thesis supporting the perspective that illicit capital that leaves the African continent can be offset with foreign aid. In the same vein, policies which are directed to compensate capital flight with foreign aid are not designed to help SSA countries, not least because it can be understood as worthwhile economics.

The above study departs from the extant African-centric employment literature that has largely focused on *inter alia*, nexuses between information technology, financial access and mobile money innovations for self-employment (Ngono, 2021); the importance of digital infrastructure in employment services (Ndubuisi *et al.*, 2021); understanding Africa's youth employment crisis (Sumberg *et al.*, 2021), especially in the light of the rural youths that are most affected (Carreras *et al.*, 2021; Dolislager *et al.*, 2021) and the nexus between foreign aid and employment in Africa (Nchofoung *et al.*, 2022). On the other hand, non-African gender-centric literature related to employment has largely been concerned with, *inter alia*, the incidence of technologies on employment (Filippi *et al.*, 2023; Tian, 2023), incidence of renewable energy

on employment (Liu et al., 2023) as well as how health care intensity (Simard-Duplain, 2022), internal competition (McKay, 2019) and artificial intelligence (Batiz-Lazo et al., 2022) affect employment.

Of the highlighted extant studies, the closest in the literature to the present positioning is Nchofoung *et al.* (2022) which has investigated linkages between foreign development aid and employment in Africa using the fixed effects, random effects, the Feasible Generalised Least Squares (FGLS), and the Driscoll/Kraay estimators to conclude that foreign aid overall harms employment in Africa, though the effect is also contingent on economic sectors and regions in the continent. The present study departs from the underlying study by conditioning the relationship between foreign aid and unemployment on the mechanism of capital flight. In doing so, the present study investigates the nexus between foreign aid and unemployment from an indirect premise. This distinguishing feature is further articulated in terms of foreign aid thresholds that are relevant in influencing the nexus between capital flight and unemployment in the desired direction. Accordingly, we argue that while direct linkages are worthwhile in terms of policy implications, tailoring the empirical analysis to provide policy makers with actionable foreign aid critical masses or thresholds is even more worthwhile.

A second distinguishing feature of this study with respect to the underlying study is that we argue that the investigated nexuses can be contingent on initial levels of unemployment such that countries with low, intermediate and high existing levels of unemployment respond differently to the considered linkages. It is in this respect that the empirical strategy adopted is an estimation approach that allows the investigated linkages to be considered throughout the conditional distribution of unemployment.

Whether the established linkages are sensitive to above- and below-medians of unemployment is a matter of empirical scrutiny, which has been presented in the empirical results section.

The rest of the study is organized in the following manner. The theoretical underpinnings and development of corresponding hypotheses are covered in Section 2. Section 3 discusses the data and methodology. Section 4 covers the empirical results. Section 5 concludes with implications and future research directions.

2. Theoretical underpinnings and hypotheses development

Given that capital flight and foreign aid, which are the main independent variables of interest in the study, constitute external flows, the theoretical underpinning of the present study is framed within the remit of dependency, endogenous and neoclassical theoretical perspectives (Asongu *et al.*, 2023; Ofori *et al.*, 2023). First, in the neoclassical growth theory of Solow (1956) and Swan (1956), there is an underlying acknowledgment that economic development substantially depends on external flows. The corresponding theoretical premise maintains that countries can boost their capital levels needed for the funding of domestic investments by relying on external flows. The theoretical underpinning, which is supported by Barro *et al.* (1992), maintain that such movements in external flows are facilitated by the globalization process. Hence, this theoretical underpinning is consistent with the present study because globalization, *inter alia*, has facilitated external flows to SSA for investment purposes which are correspondingly linked to illicit financial flows as well as foreign aid that can be used to mitigate the negative externalities for such flows on domestic economic development such as unemployment (Asongu & Nnanna, 2020).

Second, connected to the neoclassical theory is the endogenous growth theory which maintains that external flows have an influence on, *inter alia*, technological progress, physical capital stock and human capital stock (Grossman & Helpman, 1991; Krueger, 1998; Asongu *et al.*, 2023; Ofori *et al.*, 2023). The external flows, therefore, in the forms of capital flight and foreign aid are expected to have an incidence in the quality of competitive human capital within the remit of employment. Accordingly, improvement in endogenous dynamics owing to the enhancement of technological progress, *inter alia*, should engender growing returns in human capital which can be captured by employment opportunities (Rivera-Batiz & Romer, 1991; Borensztein *et al.*, 1998; Ofori *et al.*, 2023).

Third, according to the dependency theory, external flows have negative effects on socio-economic development and employment in developing countries (Girling, 1773). Such dependence can be on foreign investment, which engenders illicit capital flow or capital flight, as well as foreign aid for which the effect on recipient economies has not reached a consensus in the extant foreign aid literature (Asongu, 2015). According to the theoretical perspective, in the short term, external flows can engender production mismatches and high unemployment in the labour market owing to job losses (Asongu & Nwachukwu, 2016b; Ndikumana & Sarr, 2019). However, as maintained by Barro *et al.* (1992), in the long run, favorable socio-

economic outcomes can be expected in the domestic economy due to, *inter alia*, progress in technology and efficiency in investments.

In the light of the above, it is argued by the extant literature that development assistance is fundamental in international debates, especially as it pertains to decisions surrounding which developing countries should receive more or less foreign aid in the light of their initial levels of economic development as well as the intrinsic motivations of donor countries (Ruben, 2012). According to the narrative, the alignment and harmonisation of some policies and practices by donors are substantially contingent on fundamental features that drive the effectiveness of development assistance in achieving the targeted objectives for which the attendant assistance is delivered in the first place. Moreover, donor agencies, for the most part, base their decisions on transaction costs as well as comparative advantages in the decision of whether to allocate foreign aid to a poor country and not to another country. From a political perspective, concerns surrounding public accountability, public administration and the mobilization of domestic resources in terms of tax income are also fundamentally contingent on the capacities of recipient countries to effectively manage their financial resources (Ohno & Niiya, 2004). It follows that according to the narrative, whether development aid is provided or not is also contingent on existing economic development conditions, such as the extant levels of unemployment, not least because some aid is targeted to improve employment prospects and opportunities in recipient countries (Ruben, 2012; Nchofoung *et al.*, 2022).

The absence of capital for financing development projects can push poor countries to depend on foreign aid as a means of funding the corresponding development projects. This thus confirms the interconnection between capital flight and foreign aid in the achievement of development outcomes in poor countries. In other words, this motivates the interaction between foreign aid and capital flight within the remit of the empirical analysis, as supported by the motivation of this study and captured in the testable hypotheses that conclude this section. This intuition is consistent with the theoretical underpinnings discussed in the previous paragraph and is also in accordance with the extant literature on the subject. For instance, Njamen *et al.* (2020) have posited that in the absence of financial resources, especially as it is the case with most African countries, the attendant countries are constrained to resort to external debt and foreign aid as alternative mechanisms of funding development projects. Moreover, according to the narrative, the demand for foreign aid by these poor countries is consistent with the Keynesian theory of employment. In essence, this is consistent with a thesis developed by

Keynes supporting the view that demand affects production in every economy, especially as it pertains to the demand for higher employment levels. This theoretical postulation is apparent in how corporations anticipate demand and determine their output, in accordance with the position that employment is a function of expected demand from corporations (Nchofoung *et al.*, 2022).

The narrative also maintains that the effectiveness of development assistance is fundamentally based on specific interventions as well as on trials to establish and fill gaps in development studies. As maintained by Milgrom and Roberts (1995), some organizational practices and activities tend to be adopted together because they are complementary from a policy standpoint. Hence, the underlying study is consistent with the positioning of the present study on interacting foreign aid with capital flight, not least because these are also broadly in line with the dependency, endogenous and neoclassical theoretical perspectives theories earlier discussed.

In the light of the above, the following testable hypotheses can be considered within the remit of the empirical section.

Hypothesis 1: capital flight increases unemployment while foreign aid dampens the positive incidence of capital flight on unemployment.

Hypothesis 2: there are critical levels or thresholds of foreign aid at which the positive incidence of capital flight on unemployment is completely mitigated.

It is worthwhile to articulate that development assistance is anticipated to boost employment because of the extant literature on the importance of foreign aid in providing employment opportunities. These studies include: Martínez-Zarzoso *et al.* (2016) on the conclusion that foreign aid affects employment and German exports. According to Gnanon (2018), development assistance tailored towards improving trade flows enhances the diversification of employment in various sectors (i.e., agriculture, industrial and service) in recipient countries. Gnanon (2020) has broadly been confirmed by Gnanon (2018), while Tanveer *et al.* (2019) have shown that in Pakistan, foreign boosts employment.

3. Data and methodology

3.1 Data

The study is focused on 20 countries in sub-Saharan Africa for the period 1996-2018¹. The choice of countries and attendant periodicity is motivated by constraints in the availability of data, especially as it pertains to the capital flight variable. The data are obtained from three main sources, notably: (i) World Development Indicators (WDI) of the World Bank; (ii) the Findex database of the International Monetary Fund (IMF) and (iii) the Political Economy Research Institute (PERI) of the University of Massachusetts.

Consistent with the motivation of the study, the main outcome variable is total unemployment (% of total labour force), the main mechanism is capital flight, while the moderating or policy variable is net official development assistance (% of GDP). In order to make the capital flight variable comparable with other variables in terms of mean values as well as avoid negative capital flight values for which logarithms cannot be taken, the natural logarithm of the capital flight variable is taken. This is done by taking the logarithm after adding 20 000 (i.e., in numbers) to all values of the capital flight variable across countries and years. 20 000 is chosen because the highest negative capital flight value is close to -20 000. This mode of transformation is informed by the extant capital flight literature in which such capital flight data are transformed prior to being employed in empirical analysis (Asongu *et al.*, 2022).

In order to account for variable omission bias, the study controls for the following factors in the light of the extant literature on employment and inclusive economic development (Duflo, 2012; Asongu & Odhiambo, 2020a; Ndubuisi *et al.*, 2021; Sumberg *et al.*, 2021; Ngono, 2021; Carreras *et al.*, 2021; Dolislager *et al.*, 2021; Nchofoung *et al.*, 2022), namely: remittances, foreign investment, inflation, trade openness, population growth and financial development. In essence, Nchofoung *et al.* (2022) have shown that trade and foreign direct investment in Africa reduce employment while inflation and population growth are intuitively connected to more prospects of unemployment. Accordingly, population is associated with more people that have to be employed, while inflation can translate into economic instability or a poor economic outlook that does not encourage investors to implement the much-needed investment activities that are essential for employment prospects. Remittances and financial development have also

¹ The 20 sampled countries are: Botswana, Burkina Faso, Cameroon, Congo Republic, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania and Uganda.

been recently established to drive industrialization and, by extension, employment in Africa (Efobi *et al.*, 2019; Asongu & Odhiambo, 2020b).

The definitions of the variables and corresponding sources are provided in Panel A of Appendix 1. Panel B of Appendix 1 shows the summary statistics. Panel C of Appendix 1 discloses the correlation matrix. Panel B of Appendix 1 is relevant in the computation of foreign aid thresholds, *inter alia*, because the computed thresholds should be within statistical range as apparent in the summary statistics. Moreover, in terms of mean values, the summary statistics only inform the study as to whether the considered variables are comparable, while the corresponding standard deviations show that reasonable expected linkages could be established from the empirical results.

3.2 Methodology

In order to assess the nexuses between capital flight, foreign aid and unemployment throughout the conditional distributional of unemployment, the methodology adopted is the quantile regressions empirical strategy. This is in accordance with contemporary literature on the importance of such an approach in articulating low, intermediate and high initial levels of the outcome variable (Asongu & Simo-Kengne, 2022). In essence, the choice of the estimation approach is premised on the supposition that the estimated linkages are contingent on initial levels of unemployment such that countries with various initial levels of unemployment respond differently to the interaction between foreign aid and capital flight.

It is important to articulate that the potential asymmetric incidence violates the assumption of normality and renders a distribution-free model like the quantile model a worthwhile empirical strategy that is consistent with the motivation of the study disclosed in the introduction. Moreover, the quantile regressions approach is robust to outliers (Koenker & Hallock, 2001), not least because it takes into account the whole conditional distribution of unemployment or the outcome variable (Powell, 2014, 2015; Asongu, 2017).

Considering that errors are distributed identically for the whole conditional distribution and acknowledging that slopes are different at various quantiles of the unemployment distribution, the model is represented by Koenker and Bassett (1978) as:

$$y_{it} = X_{it}\beta_{\theta} + \varepsilon_{\theta it} \text{ with } Quant_{\theta}(y_{it}/X_{it}) = X_{it}\beta_{\theta} \quad (1)$$

where y is the dependent variable, X is the vector of covariates, β is the vector of parameters, ε is the vector of error terms and $Quant_{\theta}(y_{it}/X_{it})$ determines the θ th conditional quantile of y given X .

We apply the quantile regression on the following unemployment equation:

$$Unemployment_{it} = \beta_0 + \beta_1 Capital\ flight_{it} + \beta_2 Aid_{it} + \beta_3 Remittances_{it} + \beta_4 FDI_{it} + \beta_5 Inflation_{it} + \beta_6 Trade_{it} + \beta_7 Population_{it} + \beta_8 Finance_{it} + \varepsilon_{it} \quad (2)$$

where i =country ($i = 1, \dots, N$) and t =year ($t = 1, \dots, T$), *Unemployment* is total unemployment (% of total labour force), *Capital flight* is the natural logarithm of real capital flight, *Aid* is net official development assistance (% of GDP), *Remittances* is remittances as a percentage of GDP, *FDI* is foreign direct investment (% of GDP), *Inflation* is consumer price (annual %), *Trade* is imports and exports (% of GDP), *Population* is population growth (% of annual) and *Finance* is the composite financial development index for financial dynamics of depth, access and efficiency. It is important to note that, consistent with extant literature focusing on quantile regressions (Asongu & Eita, 2023a, 2023b), preliminary tests such as unit roots and cointegration tests are not required for the implementation of the quantile regression approach because the empirical technique is employed on data in level series.

4. Empirical results

The empirical results are presented in this section in Table 1, which is divided into six main columns, notably: the first column provides the variables and the corresponding information criteria needed for the validity of the models. The second column discloses the corresponding ordinary least squares (OLS) findings, while the third to the seventh columns disclose the quantile regressions estimates pertaining respectively to the 10th, 25th, 50th, 75th and 90th quantiles. It is worthwhile to also emphasize that as one moves from the 10th to the 90th quantile (in this order), existing levels of unemployment are higher. In other words, existing levels of unemployment are least in the 10th quantile while these are highest in the 90th quantile. In essence, the 10th quantile entails countries with the lowest levels of unemployment, while the 90th embodies countries with the highest levels of unemployment. This clarification is worthwhile, not least because a motivation for engaging the estimation approach is to consider assessing the nexuses throughout the conditional distribution of unemployment. It follows that emphasis is put on countries with low, intermediate and high initial levels of unemployment.

Prior to discussing the established findings, it is important to articulate that in accordance with the motivations underlying the choice of the empirical strategy, the estimated independent variables of interest are not consistently significant throughout the conditional

distribution of unemployment. This is evidence of the perspective that countries with below-median levels of unemployment respond differently to the considered mechanism (i.e., capital flight) and moderating variables (i.e., foreign aid) compared to countries with above-median levels of unemployment. Accordingly, the considered interactions for which thresholds can be computed are exclusively significant in bottom quantiles or the below-median distribution of unemployment. Moreover, the distinction in terms of significance as well as the magnitude of estimated coefficients between the OLS and quantile regression estimates also confirm the choice of the estimation approach. It is also worth articulating that the analytical approach departs from the empirical strategy employed by Nchofoung et al. (2022), which is based on mean values of the outcome variable. In other words, the OLS regressions are based on mean values of the unemployment outcome variables, whereas this is not the case with the quantile regressions estimates because the latter are assessed throughout the conditional distribution of unemployment.

In order to examine the investigated hypotheses provided in Section 2, two information criteria are worth articulating. On the one hand, for *Hypothesis 1* to be valid, the unconditional effect of capital flight on unemployment should be positive, whereas the corresponding conditional or interactive incidence (i.e., between capital flight and foreign aid) should be negative. The fulfilment of this criterion implies that capital flight unconditionally increases unemployment in the sampled countries while foreign aid mitigates the underlying positive incidence of capital flight on unemployment.

On the other hand, for *Hypothesis 2* to be valid, foreign aid thresholds at which foreign aid completely mitigates the positive incidence of capital flight on unemployment should be apparent. Moreover, the attendant thresholds should make economic sense in that they should be statistically relevant and policy worthwhile. Statistical relevance is premised on the fact that the computed threshold should be within statistical range (i.e., minimum to maximum levels of the attendant thresholds disclosed in the corresponding summary statistics) while being policy-worthy is the notion that the computed thresholds should be closer to the minimum range compared to the maximum range. Accordingly, when computed thresholds are closer to the minimum compared to the maximum range, it is an indication that it can be easily achieved by policy makers of sampled countries. Conversely, a threshold that is very close to the maximum value of the corresponding statistical range is an indication that much policy effort and resources are needed for sampled countries in order to make the recommended threshold actionable.

The following findings can be established from the results disclosed in Table 1. (i) *Hypothesis 1* is valid in the bottom quantiles because capital flight has a positive unconditional incidence on unemployment while foreign aid dampens the underlying positive unconditional nexus. *Hypothesis 2* is also valid in the bottom quantiles because in order for the positive incidence of capital flight to be completely dampened, foreign aid thresholds of 2.230 (i.e., 0.669/0.300) and 3.964 (i.e., 1.657/0.418) (% of GDP) are needed at the 10th and 25th quantiles, respectively of the conditional distribution on unemployment. Moreover, the foreign aid thresholds make economic sense and are policy-worthy because they are: (i) situated within the statistical range (-0.168 to 33.661) of foreign aid apparent in the summary statistics. (ii) These thresholds are closer to the minimum compared to the corresponding maximum value in the summary statistics. Most of the control variables are significant with the expected signs. This narrative on the computation of thresholds is consistent with contemporary interactive regression literature, *inter alia*: Tchamyou (2019), Nchofoung and Asongu (2022a, 2022b) and Nchofoung *et al.* (2021).

In order to enhance readability and flow, it is worthwhile to further clarify the computation above with an example. Taking the 25th quantile for illustration, at the established 2.230 foreign aid (% of GDP) threshold, the overall effect of capital flight on unemployment is zero or $0.000 = ([2.230 \times -0.300] + [0.669])$. In the corresponding computation, 2.230 is the foreign aid threshold, 0.669 is the unconditional incidence of capital flight on unemployment, while -0.300 is the conditional or interactive incidence of capital flight on unemployment. It follows that if the level of foreign aid in the corresponding quantile is increased beyond the prescribed policy threshold, the overall incidence of capital flight on unemployment will be negative. Let us take another illustrative example: assuming that the targeted level of foreign aid is 2.500 (% of GDP), *ceteris paribus*, the corresponding net effect of capital flight of unemployment will be negative or $-0.081 = ([2.500 \times -0.300] + [0.669])$.

Table 1: Foreign aid, capital flight and unemployment (thresholds of foreign aid)

	Dependent variable: unemployment rate					
	OLS	Q.10	Q.25	Q.50	Q.75	Q.90
Constant	5.913 (0.429)	-3.606 (0.128)	-12.446* (0.055)	1.603 (0.913)	4.057 (0.857)	-7.340 (0.674)
Capital Flight (CF)	0.123 (0.863)	0.669*** (0.001)	1.657** (0.011)	-0.050 (0.973)	0.297 (0.895)	2.067 (0.236)
Foreign Aid (FA)	1.291 (0.737)	2.875*** (0.001)	4.023* (0.080)	1.544 (0.767)	2.646 (0.741)	3.673 (0.552)
CF× FA	-0.165 (0.670)	-0.300*** (0.000)	-0.418* (0.071)	-0.167 (0.750)	-0.310 (0.700)	-0.431 (0.489)
Remittances	-1.142*** (0.000)	-0.234*** (0.000)	-0.303*** (0.009)	-0.752*** (0.005)	-1.077*** (0.008)	-0.157 (0.616)
Foreign Investment	-0.072 (0.277)	-0.026* (0.080)	-0.004 (0.918)	-0.038 (0.677)	-0.086 (0.543)	-0.120 (0.273)
Inflation	0.064*** (0.006)	0.020*** (0.003)	0.058*** (0.002)	0.098** (0.021)	0.065 (0.316)	0.074 (0.138)
Trade Openness	-0.0003 (0.981)	-0.003 (0.102)	0.002 (0.657)	0.034** (0.016)	0.084*** (0.000)	0.055*** (0.001)
Population growth	0.288 (0.577)	-0.116 (0.269)	-0.044 (0.879)	-0.256 (0.696)	-0.250 (0.804)	-0.274 (0.724)
Financial Development	25.894 (0.000)	5.417*** (0.000)	-1.953 (0.345)	36.338*** (0.000)	23.741 (0.001)	29.442*** (0.000)
Foreign aid thresholds	na	2.230	3.964	na	na	na
R ² /Pseudo R ²	0.397	0.120	0.053	0.157	0.349	0.368
Fisher	24.76***					
Observations	395	395	395	395	395	395

*, **, ***: significance levels of 10%, 5% and 1% respectively. OLS: Ordinary Least Squares. R² for OLS and Pseudo R² for quantile regression. Lower quantiles (e.g., Q 0.1) signify nations where unemployment rate is least. na: not applicable because at least one estimated coefficient needed for the computation of threshold is not significant. Differences in terms of observations in Table 1 and Appendix 2 are traceable to an unbalanced panel dataset that is used for the study. Accordingly, missing observations characterize an unbalanced panel data set.

It is important to note that while there is a positive and significant relationship between foreign aid and unemployment in Table 1, the investigated hypotheses are still justified. Accordingly, the foreign aid estimate cannot be interpreted in isolation because interactive regressions are not interpreted as in linear additive models (Brambor *et al.*, 2006). Moreover, within the context of the study, when the partial derivative of unemployment on capital flight is taken, the unconditional effect of foreign aid is zero. Accordingly, foreign aid is a moderating variable; hence, its unconditional effect is not considered in the computation of the foreign aid threshold. The computation of the foreign aid threshold involves the unconditional effect of capital flight divided by the conditional or interactive effect of capital flight.

The findings broadly speak to the perspective that capital flight, which is understood as unrecorded cash flows from transactions between a given country and the rest of the world, can negatively affect the process of industrialization. This is essentially because such capital outflows limit the possibilities of investments that potentially generate employment (Naude *et al.*, 2013; Asongu & Odhiambo, 2019; Efobi *et al.*, 2019). This is even more apparent in terms of negative economic development externalities when the manufacturing sector is lacking in

capital, such as in the case of manufacturing sectors in sub-Saharan African countries (Gui-Diby & Renard, 2015).

In terms of foreign aid, it is worthwhile to also articulate that the findings within the remit of sub-Saharan Africa are consistent with a strand of non-African centric literature that has established that foreign aid can improve employment opportunities. Accordingly, Martínez-Zarzoso *et al.* (2016) have investigated how development aid influences German exports and employment. Gnanngnon (2018) has shown that aid for trade inflows boosts the diversification of employment in the service, industrial and agricultural sectors of recipient counties. Gnanngnon (2020) has further established that the underlying nexus in Gnanngnon (2018) can be contingent on the values of the manufacturing sector and exchange rate. Tanveer *et al.* (2019) posit for the positive incidence of foreign aid in employment in Pakistan.

5. Concluding implications and future research directions

This study has assessed the relevance of foreign aid in the incidence of capital flight on unemployment in 20 countries in sub-Saharan Africa. The study is for the period 1996-2018 and the empirical evidence is based on interactive quantile regressions in order to assess the nexuses throughout the conditional distribution of the unemployment outcome variable. From the findings, capital flight has a positive unconditional incidence on unemployment, while foreign aid dampens the underlying positive unconditional nexus. Moreover, in order for the positive incidence of capital flight to be completely dampened, foreign aid thresholds of 2.230 and 3.964 (% of GDP) are needed at the 10th and 25th quantiles, respectively, of the conditional distribution of unemployment. It follows that the relevance of foreign aid in crowding out the positive incidence of capital flight on unemployment is significantly apparent only in bottom quantiles or countries with below-median levels of unemployment. Policy implications are discussed in what follows.

First, capital flight remains a concerning policy syndrome that has to be significantly dealt with if unemployment levels are to be reduced in SSA, especially in the light of the growing population and corresponding unemployment associated with such a growing population. It is important to note that SSA is projected to represent a significant part of the population of the world by 2050. The corresponding projection is an indication that fighting capital flight remains one of the mechanisms by which socio-economic crises resulting from the attendant demographic change can be arrested now, in the near future, and in the distant future. Moreover,

fighting capital flight would require global as well as African continental action and coordination in terms of policies designed to stop illicit financial flows.

Second, the use of foreign aid as a moderating or policy variable has shown that while foreign aid is relevant in compensating for the positive effect of capital flight on unemployment, it is not a necessary and sufficient condition to completely dampen the unfavorable incidence of capital flight, unless some critical levels of foreign aid are reached. The thresholds or critical levels of foreign aid directly speak to both national and international policy makers because these policy makers are provided in this study with actionable critical levels of foreign aid (% of GDP) that are worthwhile in reducing unemployment, contingent on the policy syndrome of capital flight. Development assistance can be utilized to create jobs if the underlying aid is allocated to funding investments in a sector that potentially engenders employment opportunities. For instance, it has been argued by Boone (1996) that when development assistance is used to fund investments instead of consumption activities, externalities in terms of employment opportunities are more apparent. Moreover, foreign aid for employment purposes can be allocated such that, in urban areas, such aid is tailored to promote a business-friendly atmosphere, while in rural areas, it is oriented towards providing local resources needed to consolidate local employment (Gamso & Yuldashev, 2018).

Third, the investigated nexuses for which thresholds can be computed are exclusively apparent in the bottom quantiles of the conditional distribution of unemployment. This implies that in order for policy makers to employ the engaged channel and consider the moderating variable to reduce unemployment in the sampled countries, initial work is needed to reduce existing unemployment to acceptable unemployment levels. These are unemployment levels below the median of the unemployment distribution. Hence, policies should be designed to reduce unemployment before concurrent policies prescribed in the previous paragraphs can be anticipated to yield favorable benefits in terms of reducing unemployment. In the top quantiles where initial levels of employment are comparatively high, donor agencies and policy makers can work towards, *inter alia*, removing unwarranted barriers to employment, avoiding high labour costs, boosting employees' productive abilities and skills as well as the degree by which deficiencies in skills can cause some employment vacancies to remain unfilled for a significant period of time.

Fourth, in the light of the above, granting that the intuition for the study withstands empirical scrutiny, the policy importance of this study is based on the perspective that the negative consequence of capital flight in SSA, especially as it pertains to employment opportunities, can be offset by more foreign aid. It is also worthwhile to note that this policy prescription is not a call for the promotion of foreign aid in exchange for capital flight. On the contrary, it can also be seen as a thesis supporting the perspective that capital flight that leaves the African continent can be offset with foreign aid and that policies that are designed for foreign aid to compensate for capital flight are a form of economic justice.

The findings of the study evidently leave space for improvement, especially in view of considering other instruments by which the incidence of capital flight can be dampened in the African continent. Moreover, considering the objectives of Agenda 2063 of the African Union as well as the United Nations 2030 sustainable development goals (SDGs) as outcome variables are worthwhile future research endeavours. Such future directions could better inform policy makers on how the nexuses between foreign aid and capital flight can be understood within the remit of this comprehensive continental and global agenda. Some insights into how foreign aid can be reinvented for inclusive and sustainable development have been documented in a survey by Asongu (2016). Furthermore, future studies should use more updated capital flight data.

Appendices

Appendix 1: Definitions and sources of variables, summary statistics and correlation matrix

	Panel A: Definitions and sources of variables								
Unemployment	Unemployment, total (% of total labour force)						WDI (World Bank)		
Capital flight	Natural log of (real capital flight plus 20000)						PERI		
Foreign aid	Net official development assistance (% of GDP)						WDI (World Bank)		
Remittances	Remittances as a percentage of GDP						WDI (World Bank)		
Foreign investment	Foreign direct investment as a percentage of GDP						WDI (World Bank)		
Inflation	Inflation, consumer prices (annual %)						WDI (World Bank)		
Trade openness	Imports and exports as a percentage of GDP						WDI (World Bank)		
Population	Population growth (% of annual)						WDI (World Bank)		
Financial development	Composite financial development index (depth, access and efficiency)						Findex database (IMF)		
	Panel B: Summary statistics								
					Mean	S.D	Min	Max	Obs
Unemployment					7.648	7.379	0.560	33.473	460
Capital flight (log)					9.967	0.313	5.447	11.244	455
Foreign aid					7.048	6.801	-0.168	33.661	437
Remittances					1.479	1.660	0.000	10.130	432
Foreign investment					3.661	5.846	-8.703	57.837	437
Inflation					8.292	10.010	-8.484	132.823	419
Trade openness					67.511	38.439	17.858	225.023	420
Population					2.551	0.804	-2.628	8.117	437
Financial development					0.145	0.107	0.033	0.648	460
	Panel C: Correlation matrix								
	Unemp	CapF	ODA	Remi	FDI	Inflation	Trade	Popg	FinD
Unemp	1.000								
CapF	0.076	1.000							
ODA	-0.429	-0.122	1.000						
Remi	-0.282	0.122	-0.046	1.000					
FDI	-0.054	0.003	-0.049	0.036	1.000				
Inflation	-0.014	0.006	0.156	0.074	-0.019	1.000			
Trade	0.163	-0.052	-0.242	-0.270	0.485	-0.132	1.000		
Popg	-0.283	-0.035	0.312	0.101	-0.158	-0.006	-0.395	1.000	
FinD	0.527	0.196	-0.442	-0.118	0.000	-0.091	0.187	-0.522	1.000

Unemp: Unemployment. CapF: Capital Flight. ODA: Official Development Assistance. Remi: Remittances. FDI: Foreign Direct Investment. Popg: Population growth. FinD: Financial Development. SD: Standard Deviation. Min: Minimum. Max: Maximum. Obs: Observations. WDI: World Development Indicators. IMF: International Monetary Fund. PERI: Political Economy Research Institute, University of Massachusetts.

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