**Theme**

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Governance and accountability

**Title**

Institutional quality and illicit financial flows in Sub-Saharan Africa

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**Abstract**

The objective of this research is to assess the effect of institutional quality on illicit financial flows in Sub-Saharan Africa during the period from 2002 to 2018. It is based on panel data from 23 countries and uses the generalized method of moments as an estimation strategy. It shows that improving institutional quality reduces illicit financial flows, notably through corruption control, citizen voice and accountability, and political stability. It also shows that institutional quality reduces illicit financial flows through trade openness. It therefore suggests effective institutional policies and controlled trade openness to reduce illicit financial flows in sub-Saharan Africa.

**Keywords:** Institutional quality, illicit financial flows, Sub-Saharan Africa, GMM

**1 Introduction**

Sub-Saharan Africa (SSA) is a region that suffers heavy financial losses due to illicit financial flows (IFFs)[[1]](#footnote-1), i.e. undeclared[[2]](#footnote-2) funds that are illegally acquired, transferred or used as proceeds of criminal or corrupt activities outside the continent. According to estimates by the Global Financial Integrity organization (GFI, 2017), FFIs reached $836 billion between 2000 and 2015, more than the total amount of Official Development Assistance (ODA) and Foreign Direct Investment (FDI) received by the region over the same period.

FFIs have negative effects on economic and social development in SSA, reducing the resources available to finance public spending, worsening external debt, fostering corruption and weakening governance. FFIs are a complex and multidimensional phenomenon, which has given rise to numerous theoretical and empirical debates in the economic literature. A number of theoretical and empirical studies have analyzed the effects of institutional quality on FFI. For example, Ndikumana and Boyce (2011) showed that improving institutional quality reduces FFI in Africa. Similarly, Ndiaye and Siri (2016) found that controlling corruption, the rule of law and political stability reduce FFIs in developing countries. In addition, some authors have highlighted the moderating role of trade openness on the relationship between institutional quality and FFI. For example, Reuter (2012) has suggested that trade openness reduces incentives to transfer illicit funds abroad when institutional quality is high.

In addition, some authors highlight the structural causes of IFFs, linked to the level of development, the structure of foreign trade, macroeconomic volatility or even the weakness of the financial system in SSA (Ajayi, 1997; Ndikumana, 2014; Ndiaye and Siri, 2019). Other authors emphasize the role of institutional factors, such as the quality of regulation, fiscal transparency, the efficiency of the justice system or respect for property rights ( Ndikumana and Boyce, 2019; UNECA, 2020; Zucman, 2015). Empirical research attempts to measure the extent and determinants of FFI in the region, using different data sources and methods. They lead to sometimes divergent results, depending on the indicators and models used (Fofack and Ndikumana, 2014; Ncube et al., 2014; Ravallion, 2018). However, this research has certain limitations, including the choice of institutional quality indicators, the consideration of regional or national specificities, or the robustness of results to different estimation methods. Consequently, there is a need for further research into the effects of institutional quality on FFI in SSA.

With regard to the level of FFI and institutional characteristics in SSA, we formulate the following question: What are the effects of institutional quality on illicit financial flows in SSA? Specifically, we aim to answer the following questions: (i) What are the specific forms of institutions that affect FFIs in SSA? (ii) What are the interactive effects of institutional quality and commercial openness on IFFs in SSA?

The aim of this research is to analyze the effects of institutional quality on FFIs in SSA over the period from 2002 to 2018. To this end, the specific objectives are to: (i) identify the effects of specific institutional forms on FFI in SSA; (ii) analyze the interactive effects of institutional quality and commercial openness on FFI in SSA.

Answering these questions leads us to formulate the main hypothesis that improving the quality of institutions reduces IFF in SSA. Two auxiliary hypotheses follow from this main hypothesis, namely: (i) Corruption control, citizen voice and accountability, and political stability reduce illicit financial flows in SSA. (ii) Institutional quality has a synergistic effect with trade openness on reducing illicit financial flows in SSA.

The theoretical research model used derives from the portfolio choice model based on the work of Le and Rishi (2006) and Le and Zak (2006), in which we integrate the various institutional indicators. This model is chosen for the fact that it allows economic agents to choose the destination of their funds based on the comparative advantages of the various destination countries. Moreover, unlike Orkoh et al (2017) and Thiao (2021), who used the Double Least Squares (DLS) method, we will use the Generalized Moment Method (GMM) in the system for the various estimates, not only to correct potential endogeneity problems linked to institutional quality, but above all to take into account the dynamic effects of FFIs. It covers a panel of 23 SSA countries, observed over the period from 2002 to 2018. The data used comes from Global Financial Integrity (GFI) on FFIs and World Bank Governance Indicators (WGI,2022). The GFI measure aims to capture the illicit share of financial flows using the Trade Mispricing model and the Hot Money Measure (HMN). The control variables used come from the World Bank's World Development Indicators (WDI) database (World Bank,2022).

This research focuses on SSA for two main reasons. Firstly, empirical evidence reveals the growing scale of the financial haemorrhage caused by FFIs in particular (GFI, 2017; Ndikumana and Boyce, 1998). Secondly, to our knowledge, the African literature on the development of illicit financial flows has not sufficiently captured the role of institutions in combating the scourge. As a result, recent literature has focused, among other things, on illicit financial flows and government revenues (Thiao, 2021); trade misinvoicing and capital flight (Kwaramba et al., 2016); the links between capital flight and tax revenues (Ndiaye and Siri, 2016); the relationship between corruption and IFF and the role of democracy (Yenlide, 2021); corruption, political stability and illicit financial flows (Orkoh et al., 2017). In light of the above, this study complements the literature by examining the impact of institutional quality on illicit financial flows. Moreover, from a social perspective, it aims to provide recommendations for public decision-makers in order to eradicate the scourge in SSA.

The rest of the work is organized as follows. Section 2 discusses the literature review. Section 3 describes the methodology used and presents the data and variables. Section 4 presents and discusses the results. Section 5 concludes with policy implications.

**2 Literature review**

Although numerous analyses have been carried out regarding the role of institutions on FFIs, literature on these specific channels is scarce to our knowledge. Indeed, FFIs threaten fundamental aspects of development, such as the rule of law, the quality and accountability of democratic institutions and affect social trust in the broadest sense (Hearson, 2014; Reed and Fontana, 2011; Reuter, 2017). However, Ndikumana (2013) states that political risks and insufficient investment cannot explain the huge capital outflows from the African continent. Furthermore, these illicit capital flows are often aided by corrupt governments with a preference for accumulating foreign assets (Ndikumana and Boyce, 2011), so their generation involves criminal activities such as bribery, money laundering and tax evasion (OECD, 2014). As a result, illicit capital flight results from the desire to hide illegally accumulated wealth abroad and not necessarily as a result of interest rate differentials between countries or macroeconomic policy distortions, as postulated by the neoclassical approach (Heggstad and Fjeldstad, 2010; Kar et al., 2010; Kar and Cartwright-Smith, 2009) . As for Olson (1982), political freedom favors the demands of special interest groups for redistributive policies. The central idea is that the exploitation of discretionary power is made possible by weak political, administrative and legal institutions (Aidt, 2003; Andvig et al., 2001; Bardhan, 1997). Poor-quality institutions are said to have led to pervasive rent-seeking to the detriment of economic development (Rodrik et al., 2002). Figure 1 shows the factors that encourage illicit financial flows.

**Figure 1:** Factors favoring illegal financial flows

Illicit Financial Flows

Macroeconomic factors

Structural problems

Governance and corruption

* Budget deficits
* High and variable inflation
* Overvalued real effective exchange rate (REER)
* Negative real rates of return
* Real GDP growth
* External debt
* Non-inclusive growth (worsening Gini)
* Increased commercial openness without oversight
* Reform without regulation
* Corruption
* Business climate
* Underground economy
* Political instability

Sources : Authors

In the case of empirical research there have been a number of studies on the subject of FFI in relation to institutions.

Kar (2011) argues that inequitable income distribution can lead to illicit financial flows due to the increasing number of high-net-worth individuals in economies with a relatively narrow tax base and weaker or more corrupt tax collection agencies compared to those operating in developed countries. They are also unlikely to worry about the future taxation involved in a growing government budget deficit. Overall macroeconomic conditions have an impact on a country's general business climate, encouraging domestic companies to keep more capital at home while attracting FDI into the country.

According to Orkoh et al (2017) when researching 29 SSA countries over the period 2005 to 2014 with both random and fixed effects models find that when political stability and corruption control are effective, this reduces FFI caused by false trade billings by an average of US$20.5 million and US$44.3 million respectively. They also find that a 1% increase in a country's corruption control score reduces illicit outflows of funds by around 1.5%, equivalent to around $36 million. Similarly, a one-unit increase in a country's political stability score reduces illicit financial outflows by around 1.3%, which also translates into around $53 million.

In addition, Thiao (2021) uses data from 8 countries in the West African Economic and Monetary Union (UEMOA), covering the period 1996-2013. Using estimation with the Double Least Squares (DLS) method, the research revealed that FFIs have a negative and significant effect on public revenues, and that this effect is linked to per capita income, corruption and governance.

On a panel of 36 SSA countries over the period 2005 to 2013 using the Generalized Method of Moments (GMM), Yenlide (2021) shows that corruption significantly increases illicit capital outflows. However, democracy mitigates the positive effect of corruption on illicit capital flight. Every one-unit increase in the corruption index leads to an average increase of $2 million in illicit financial flows. However, an increase in trade openness leads to an increase in the scale of illicit financial flows of around $70 million. This result suggests that excessive openness is conducive to the proliferation of illicit outflows, either in the form of over-invoicing of imports or under-invoicing of exports.

As for Ndikumana and Sarr (2019), they further investigate the relationship between financial flows and FDI inflows in Africa by applying dynamic panel methods to 32 African countries between 1970 and 2015. They find no evidence that annual FDI inflows drive financial flows, although a positive relationship exists between FDI stocks and financial flows. They also find that natural resource endowments, particularly oil, are positively related to financial flows and FDI stock. It turns out that institutional quality remains important, as the results show that even in resource-rich countries, financial flows are highly dependent on the quality of governance.

In addition, Hermes and Lensink (2000) and Le and Zak (2006) find that political risk and development aid, in the form of loans and grants, affect illicit capital flight, however defined or measured.

Ahmed et al (2020) assessed the relationship between the use of tax havens by multinationals and the scale of foreign direct investment in emerging economies, of which Africa is a key beneficiary. The research used panel data obtained from multinational enterprises (MNEs) operating in 19 developed countries covering the period from 2009 to 2017. The research concluded that illicit financial flows out of developing countries are facilitated by weak institutions and imperfect markets in these countries.

**3 Methodology and data**

This section presents the methodology, data and variables.

**3.1 Theoretical model**

To analyze the effects of institutional quality on IFFs in SSA, this research uses the portfolio choice model proposed by Le and Rishi (2006) and Le and Zak (2006). Consider an economy with many identical indefinite-lived agents living in a country. Agents consume on the return on wealth allocated to one-period investment in the home country or in a single foreign country. For simplicity's sake, there is one investment in each country, which could be considered an investment portfolio. Labor is excluded from the analysis. There is a single homogeneous good produced in both countries. The population is constant, immobile and normalized to unity.

Let be the investment in the domestic market at time t, which yields a rate of return . Investment in the domestic market is assumed to be risky due to poor governance. Agents also invest fin a foreign country, earning a risk-free, time-invariant rate of return.

A representative agent maximizes lifetime utility by solving :

)] (1)

S/C :

𝑐𝑡 = (1 + 𝑟𝑡) 𝑎𝑡 + (1+ 𝑟 𝑓) − 𝑎𝑡+1 −  (2)

Where U(c) is strictly increasing, continuous and concave.

Solving for the necessary and sufficient conditions to optimize the utility maximization problem (1) gives[[3]](#footnote-3) :

(3)

Where 𝑉𝐴𝑅(𝑟𝑡+1) is the variance of the return on domestic investment, and , measures risk aversion, which is assumed to be a constant.

Assuming that individuals in other countries also solve the analogous problem, note that the total capital invested in a country at time t is :

(4)

Where for represents capital invested by foreigners on the domestic market, represents total capital travelled by air. Capital can be described as :

(5)

where denoting legal capital flight and denoting illegal capital flight. Consequently, equation (4) becomes :

(6).

Equation (6) shows that, in equilibrium, the capital stock is made up of domestic investment and the external investment balance.

Substituting equation (6) into (3) gives,

(7)

Furthermore, since = + , equation (7) can be decomposed into two parts as follows:

(8)

(9)

where et 𝛼 + 𝛽 = 1.

As in Le and Rishi (2006), using linear production to transform capital into output, 𝑌𝑡 = 𝜆𝐾𝑡, for 𝜆 > 0, equation (9) can be written with respect to output:

(10)

This is equivalent to :

(11)

Equation (11) shows that illicit capital flight is higher when domestic return is low, investment risk is high, risk aversion is high, foreign investment is low and the parameter "β" is small. The influence of the discounting parameter "β" in this illicit capital flight equation can be attributed to factors that lead to illicit capital flight such as activities that are criminal in nature. For example, an individual may transfer capital out of a market because he or she is trying to obtain better returns in a foreign market, avoid taxation and/or launder illegally earned money. Consequently, the discount parameter "β" indicates the existence and level of environment that allows such activities to occur[[4]](#footnote-4) . The indicators that best represent the value of "β" may be indicators that capture institutional quality. Given the multidimensional nature of institutional quality, several variables will be used to capture its different aspects. In this research, "β" will be expressed in terms of the following variables: control of corruption, political stability and absence of violence, quality of regulation, government effectiveness, rule of law and citizen voice and responsibility.

(12)

As in Le and Rishi (2006), return variance arises from three types of economic risk: inflation risk, interest rate spread risk and currency risk. Assuming that each type of risk is independently distributed, we have : VAR(=variance(inflation)+variance(exchange rate)+variance(interest rate differential) (13)

Taking the natural logarithm of both sides of equation (10), we get :

(14)

et soit A =;B= ; C =; D =.

Equation (13) can then be simplified as follows: = , where the right-hand side of the above equation can be approximated by applying the Taylor[[5]](#footnote-5) expansion twice, giving:

+ + + + (15)

**3.2 Empirical model**

Based on the theoretical model (15), our basic empirical model is described by equation (16) below:

(16)

Where i is the country, t is the year; FFI are illicit financial flows; IQ is an institutional quality variable: this variable can be overall institutional quality, control of corruption, regulatory quality, citizen voice and accountability, political stability and absence of violence, government effectiveness, rule of law. Overall institutional quality is calculated using the arithmetic mean of six dimensions of institutional quality. X is a vector of control variables: trade openness, external debt, total resource rents, credit rating, inflation, interest rate differential and exchange rate.

To measure the specific effects of the different institutional quality variables and avoid the collinearity that exists between them, we estimate the effect of each institutional quality variable in different models.

The extended version of equation (15) is written as follows:

**Model 1: direct effect**

(17)

Where QI is institutional quality, Ouv is trade openness, TrN is total resource rents (% GDP), Debt is public debt, Nf is credit rating, Inf is inflation, Eri is interest rate differential and eT is exchange rate.

This research also aims to estimate the direct and indirect effects of institutional quality on FFIs in SSA over the period 2002-2018. The effect of institutional quality on FFI could not only be direct (hypothesis 1), but also indirect (hypothesis 2), such that institutional quality generates externalities that could increase[[6]](#footnote-6) or reduce[[7]](#footnote-7) FFI. Thus the coefficient (equation 16) may be underestimated or overestimated when the quality of institutions affects FFI indirectly through good management of natural resource revenues, control of macroeconomic stability and external debt, and controlled economic openness. A potential transmission channel is retained in this research, namely trade openness. Such an analysis is based on causal mediation analysis (Baron and Kenny, 1986; Hicks and Tingley, 2011; Karlson et al., 2010; Zhao et al., 2010). This approach is useful for understanding the extent to which institutional quality interacts with trade openness to reduce FFIs. The results of this analysis can be used to guide public decision-makers. To our knowledge, no previous study has examined the transmission channels through which institutional quality affects illicit financial flows in SSA. Previous studies have not analyzed the importance and significance of the transmission channels through which institutional quality affects illicit financial flows.

To determine the existence of the indirect effect on FFIs, we specify and estimate the following equation:

**Model 2: interactive effect**

(18)

Where represents the interaction variable between institutional quality and trade openness; β\_2 is the coefficient associated with the interaction variable.

This interaction allows us to examine the existence of a synergistic effect between institutional quality and trade openness on FFIs in SSA. According to Zhao and Chen (2010), the transmission channel exists if and only if is statistically significant.

**4 Data source**

The data are annual and cover a panel of 23 SSA countries[[8]](#footnote-8) over the period 2002-2018. The Global Financial Integrity database (GFI, 2010, 2019) is used for the study of FFIs. For data on institutional quality, the World Bank's WGI database (2022a) is used. In addition, data on public debt, trade openness, financial rating, total resource rents, inflation, interest rate differential and exchange rate were extracted from the World Bank's WDI database (World Bank,2022b). The choice of study period and sample size is justified by data availability.

**4.1 Variable descriptions**

Variable descriptions cover dependent variables, independent variables of interest and control variables.

**4.1.1 Dependent variables: FFIs**

This research presents three models used by economists to measure illicit financial flows (IFFs): the speculative money model[[9]](#footnote-9), the World Bank residual model [[10]](#footnote-10)and trade misinvoicing[[11]](#footnote-11). These models are based on indicators such as balance-of-payments errors and omissions, unallocated country financing and differences in trade data between partner countries. These indicators make it possible to estimate the scale of unrecorded capital outflows that constitute FFI.

In this research, we will use the GFI (2008) method of measuring false commercial invoicing (FCI) and the narrow money outflow (HMN) method to capture FCI. However, when compared to other sources, commercial false invoicing is the main measurable means by which organizations and individuals illicitly transfer funds to and from developing countries (GFI, 2008; Nitsch, 2017). Figure 2 shows the overall evolution of FFIs in SSA countries over the period 2002-2018.

Figure 2: Overall trend in FFI in SSA countries, 2002-2018

**Source:** author based on GFI data (2019)

Graph 2 shows that FFI in SSA increased by more than 122% between 2002 and 2018, from 23 billion to 51 billion US dollars. The graph also shows that FFIs have fluctuated over the study period, depending on the global economic context and the measures taken by countries to combat them. For example, between 2002 and 2003, FFI increased by 81%, from 23 billion to 41 billion dollars. This can be explained by global economic growth and rising commodity prices, which favored illicit exports from SSA to developed countries. Between 2003 and 2006, FFI fell by 3,42%, from $41 billion to $40 billion.

This can be explained by the political and economic stabilization of certain SSA countries, such as South Africa, Nigeria and Angola, which have strengthened their institutions and governance. Between 2006 and 2009, FFI exploded by 59,42%, from $40 billion to $64 billion. This can be explained by the global financial crisis of 2008, which prompted illicit actors to transfer their capital to tax havens to escape regulations and controls. Between 2009 and 2012, FFIs fell by 22,86%, from $64 billion to $49 billion. This can be explained by the banking reforms implemented by Western countries after the crisis, which aimed to reduce financial opacity and combat tax havens. Between 2012 and 2018, FFIs rose by 3,25%, from $49 billion to $51 billion. This can be explained by the global economic recovery and the diversification of FFI sources and destinations, which have made it more difficult to trace and crack down on them.

In conclusion, Graph 2 shows that FFIs are a major problem for the development of SSA, which is experiencing a massive and growing drain on its resources. It also shows that FFIs are influenced by the global economic context and the measures taken by countries to combat them. Finally, it suggests that the fight against IFF requires enhanced international cooperation and better governance at national level.

**4.1.2 Independent variable of interest: institutional quality (IQ)**

The six World Bank governance indicators[[12]](#footnote-12) are used. An overall indicator of institutional quality is calculated as the arithmetic mean of these six indicators. This method of calculating the institutional quality index has previously been used by researchers such as Asamoah (2021) and Ouedraogo et al. (2022).

These indicators are control of corruption (Corr), political stability and absence of violence (Sp), quality of regulation (Rq), citizen voice and accountability (Va), government effectiveness (Ge) and rule of law (Rl). Variable definitions, expected signs and sources are presented in Appendix Table A1. They will be introduced individually in the models, as these indicators are highly correlated with each other (see table A3 in appendix).

Graph 3 shows the evolution of the level of institutional quality in SSA countries over the period from 2002 to 2018. It can be seen that perceptions of corruption control, political stability, voice and accountability and government effectiveness in SSA have declined since 2011, and the trend is very pronounced in 2013. This means that citizens have less trust in their leaders and institutions, are more exposed to violence and conflict, have fewer opportunities to express their opinions and political choices, and enjoy fewer quality public services. Perceptions of political stability and government effectiveness were high in 2006 but very low in 2014. This means that there has been a significant deterioration in these aspects of governance between these two dates, perhaps linked to political or economic crises in some of the region's countries. Similarly, the quality of regulation and the rule of law were high in 2011 and 2015 respectively, after which there was downward pressure. This means that the government has become less effective at regulating the market and the environment, and that the judicial system has become less independent and efficient. The overall quality of institutions fluctuates between -0.6 and -0.5 over the entire study period. This means that there has been neither a significant improvement nor a major deterioration in the average level of governance in SSA. The region has failed to converge towards higher international standards of good governance.

**Figure 3:** Trends in institutional quality indicators in SSA, 2002-2018.



**Source:** authors based on World Bank WGI data (2022a)

The quadrants in graph 4 show us the correlation between institutional quality indicators (IQI) and illicit financial flows over the study period from 2002 to 2018.

Corruption control (quadrant a) has a negative correlation with IFF (r = -0.68). This means that the more a country or region combats corruption and abuse of power, the lower the FFI. This may be explained by the fact that controlling corruption reduces the possibility of embezzlement of public funds, bribery or nepotism, which are major sources of FFI.

Government efficiency (quadrant b) has a positive correlation with FFI (r = 0.55). This means that the more effective and credible a government is in its public policies, the higher the FFI. This can be explained by the fact that government efficiency increases tax collection capacity, which encourages certain economic players to conceal or relocate their income to avoid tax pressure.

**Figure 4:** Correlation between FFI and institutional indicators, 2002-2018



**Source:** author based on GFI data (2019) and World Bank WGI (2022a)

Regulatory quality (quadrant c) is positively correlated with FFI (r = 0.57). This means that the more regulations a government puts in place to encourage private sector development, the higher the FFI. This can be explained by the fact that the quality of regulation stimulates economic activity and international trade, which creates opportunities for price manipulation, false invoicing or the transfer of profits to tax havens.

The rule of law (quadrant d) has a negative correlation with FFI (r = -0.66). This means that the more a country or region respects legal rules and protects property rights, the lower the FFI. This can be explained by the fact that the rule of law guarantees the efficiency and impartiality of the judicial system, which discourages illicit behavior and facilitates its punishment.

Political stability and absence of violence (quadrant f) has a negative correlation with FFI (r = -0.65). This means that the more stable and peaceful a country or region, the lower the FFI. This may be explained by the fact that political stability and the absence of violence promote legal certainty and compliance with contracts, which reduces the incentive to transfer capital illicitly to safer areas.

Citizen voice and responsibility (quadrant e) has a negative correlation with FFI (r = -0.67). This means that the more opportunities citizens have to participate in political life and make their voices heard, the lower the FFI. This may be explained by the fact that citizen participation enhances the transparency and accountability of those in power, thus limiting opportunities for corruption and tax evasion.

Graph 5 shows that there is a negative linear relationship between FFI and institutional quality. Overall institutional quality is negatively associated with FFI. The graph also shows that Nigeria and South Africa appear to be special cases, as they lie far from the regression line that represents the general trend. Nigeria has a very high level of FFI (over 10% of GDP) and a very low level of institutional quality (less than -1). This can be explained by the fact that Nigeria is a country rich in natural resources, particularly oil, which are often the source of FFI in the form of smuggling, tax evasion or revenue detour. South Africa has a relatively low level of FFI (less than 5% of GDP) and a relatively high level of institutional quality (more than -0.5). This can be explained by the fact that South Africa is a more developed and diversified country than the average African country, with a more regulated and internationally integrated financial system.

**Graph 5:** Correlation between institutional quality and FFI, 2002-2018



**Source:** author based on data from GFI (2019) and World Bank WGI (2022a)

In conclusion, Graphs 4 and 5 show that IQs are associated with FFIs in SSA. It also shows that the association between IQs is differentiated according to dimensions of institutional quality: it can be positive or negative. For example, voice and accountability, political stability, rule of law and control of corruption are negatively associated with FFI. These correlations are confirmed by Appendix Table A2.

**4.1.3 Control variables**

Control variables are selected on the basis of existing literature. These variables are total resource rents (TrN), public debt (Debt), trade openness (Ouv), financial sector rating (Nf), inflation (Inf), exchange rate (eT), and interest rate differential (Eri). Table 1 presents the descriptive statistics of the variables.

Table 1 shows that FFIs have a mean of US$2115.831 million, with a standard deviation of US$4782.534 million. This indicates that FFIs are widely dispersed around the mean, with minimum values of US$3.062 million and maximum values of US$30934.200 million. This suggests that there is considerable heterogeneity between countries in terms of FFI. Table 1 also shows that institutional quality has a mean of -0.563, with a standard deviation of 0.556. This means that institutional quality is low overall in the sample studied, with minimum values of -1.655 and maximum values of 0.932. This implies that most countries have problems with corruption, government effectiveness, citizen voice and accountability, regulatory quality, rule of law or political stability. Furthermore, Table 1 shows that trade openness has a mean of 63.351% of GDP, with a standard deviation of 29.127%. This means that trade openness is relatively high in the sample, with minimum values of 20.723% of GDP and maximum values of 165.059% of GDP. This indicates that the countries are moderately integrated into international trade. Table 1 also shows that public debt has a mean of 18.730 (in logarithm), with a standard deviation of 1.871. This means that public debt is quite high in the sample, with minimum values of 13.290 (in logarithm) and maximum values of 24.057 (in logarithm). This implies that countries have significant external financing needs. Finally, it shows that the other explanatory variables have varying means and standard deviations from case to case. For example, resource rents have a mean of 9.141% of GDP and a standard deviation of 8.698% of GDP; credit ratings have a mean of 3.098 and a standard deviation of 0.472; inflation has a mean of 6.468% and a standard deviation of 9.259%; the exchange rate has a mean of 701.341 and a standard deviation of 1106.231; and the interest rate spread has a mean of 6% and a standard deviation of 10.054%. These variables can have varying effects on FFIs, depending on whether they act as push or pull factors for FFIs.

**Table 1: Descriptive statistics, 2002-2018**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | Obs | Avg | Standard | Variables | Obs |
| Illicit financial flows | 391 | 2115.831 | 4782.534 | 3.062 | 30934.200 |
| Institutional quality | 391 | -0.563 | 0.556 | -1.655 | 0.932 |
| Controlling corruption | 391 | -0.526 | 0.623 | -1.502 | 1.245 |
| Government efficiency | 391 | -0.716 | 0.531 | -1.810 | 0.620 |
| Voice and civic responsibility | 391 | -0.512 | 0.778 | -2.523 | 1.105 |
| Control quality | 391 | -0.610 | 0.554 | -1.870 | 0.671 |
| Rule of law | 391 | -0.574 | 0.544 | -2.202 | 0.900 |
| Political stability | 391 | -0.437 | 0.794 | -2.523 | 1.105 |
| Commercial opening | 391 | 63.351 | 29.127 | 20.723 | 165.059 |
| Official development debt (log) | 391 | 18.730 | 1.871 | 13.290 | 24.057 |
| Natural resource rents | 391 | 9.141 | 8.698 | 0.752 | 55.875 |
| Financial rating | 391 | 3.098 | 0.472 | 1.000 | 4.000 |
| Inflation | 391 | 6.468 | 9.259 | -14.200 | 108.897 |
| Exchange rates | 391 | 701.341 | 1106.231 | 0.055 | 9686.772 |
| Interest rate differential | 391 | 6.553 | 10.054 | -6.195 | 69.943 |

Source: author based on WGI and WDI databases (World Bank, 2022a, b) and GFI (2010,2019).

**5 Presentation and discussion of results**

This section presents and discusses the effects of institutional quality on IFFs in SSA over the period 2002-2018.

**5.1 The direct effects of institutional quality on illicit financial flows in SSA, 2002-2018**

Hansen's tests for model estimates taking into account the interactive variable reported in Tables 2 yield probabilities above 10%. We can therefore not reject the null hypothesis of the validity of variables lagged by at least one period and of first differences in level as instruments in our estimates at the 10% threshold. Similarly, Arellano-Bond's AR (2) autocorrelation tests cannot reject the null hypothesis of no autocorrelation of second-order errors, because the probability of the tests is greater than 10%. These results confirm that the estimators are efficient at the 10% threshold.

The results of the model estimations summarized in Table 2 show that institutional quality has a negative and statistically significant effect on FFIs in the first column. This means that the higher the institutional quality, the lower the FFI, and vice versa. Improving the institutional quality of a unit reduces FFIs by 0.790 percentage points. This result confirms the hypothesis that institutional quality is a key determinant of FFI. Indeed, better institutional quality implies better compliance with laws, rules and conventions, greater transparency and traceability of financial transactions, a stronger capacity to control and sanction illicit activities, and a weaker incentive to move capital out of the country illegally. Our results corroborate with those of Ndikumana and Boyce (2011), who found that institutional quality is a key determinant of IFFs in Africa. Furthermore, Ndikumana et al. (2015) find that improving institutional quality reduces IFFs in sub-Saharan Africa. Similarly, Ndiaye and Siri (2018) show that institutional quality has a negative effect on FFIs in West African Economic and Monetary Union (WAEMU) countries. Furthermore, Mossadak and Lahlou (2013) find that an improvement in institutional quality measured by corruption control and political stability in the public sector reduces illicit capital flight in the MENA region. The authors argue that these variables strengthen economic agents' confidence in the national economic and financial system. In contrast, Ndiaye (2018) finds that institutional quality has no significant effect on FFI in the countries of the Central African Economic and Monetary Community (CEMAC).

However, this overall effect of institutional quality conceals differentiated effects according to the dimensions of institutional quality. Indeed, the results show that the different variables that measure institutional quality have varying effects on FFIs. For example, control of corruption and citizen voice and accountability have negative and significant effects on FFI in columns 2 and 4, confirming the idea that these aspects of institutional quality reduce FFI. We can see that, at a significance level of 1%, a one-unit improvement in a country's corruption control, voice and civic responsibility scores reduces outflows of illicit financial flows by around 53.4 and 53.3 percentage points respectively in SSA. This result validates our first hypothesis, which states that corruption control and voice and accountability reduce IFFs in SSA. These findings corroborate with those obtained by several previous empirical studies (Alemu,2018; Orkho et al. 2018; Thiao,2022; Yelinde,2021). These studies show that corruption is one of the main explanatory factors of IFFs in SSA, as it creates perverse incentives for economic agents to conceal their income and transfer it out of the country to escape control and sanction by the authorities. These two dimensions of governance are crucial in limiting the opportunities and incentives for economic agents to transfer funds out of the country illegally. Controlling corruption reduces the illicit rents generated by the misappropriation of public funds, tax evasion and money laundering. Corruption encourages rent-seeking and the proliferation of underground or informal circuits conducive to illegal financial outflows. Citizen voice and responsibility increase democratic participation and control over public decision-making, and reinforce confidence in institutions. These results are consistent with those of Ndikumana et al. (2015) and Ndiaye and Siri (2018), who find that these two dimensions have a negative effect on FFI in SSA and UEMOA.

In contrast, government effectiveness, rule of law and regulatory quality have negative and significant effects at 10% on FFI in columns 3, 5 and 6, suggesting that an improvement in one unit these aspects of institutional quality have a low participation in reducing FFI in SSA respectively 44.8; 32.1; 71.9 percentage points. These results are partly in line with those of Ndikumana et al. (2015), who find that government effectiveness and regulatory quality have a negative effect on FFI in SSA, but rule of law does not. They are also partly consistent with those of Ndiaye and Siri (2018), who find that rule of law and regulatory quality have a negative effect on FFIs in UEMOA, but government efficiency does not. However, these results disagree with those of Ndiaye (2018), who finds that government efficiency and regulatory quality have no significant effect on FFIs in CEMAC countries. It disagrees with that of Reuter (2017), who showed that countries with strong state capacity are more likely to be involved in FFIs. One possible explanation is that these aspects of institutional quality are more reflective of the government's administrative and regulatory capacity, which can be hijacked for illicit purposes by public or private actors. This means that when states have an effective institutional level such as the rule of law reinforcing political stability, the electorate poses a threat to political authorities to the extent that mismanagement and FFI scandals can reduce voting intentions. Since the political elite's political agenda is re-election, they are obliged to keep clear of these scandals. Effective government improves the quality and efficiency of public services, which can encourage agents to invest more in the country rather than take their capital out. Regulatory quality avoids excessive or arbitrary impediments to economic activity, which can reduce the costs and distortions associated with regulation.

Finally, political stability has a negative and significant effect at 5% on FFI in the last column, indicating that the more politically stable the country, the lower the FFI. This may be justified by the fact that political stability reduces uncertainty and risk for economic agents, who have less need to transfer their capital to safer countries. This result is consistent with that of Ndiaye and Siri (2018), who found that political instability is a key determinant of FFI in sub-Saharan Africa.

In addition to institutional quality, other variables may affect illicit financial flows in SSA. Furthermore, the coefficient of the trade openness variable is positive and statistically significant in columns (1), (2), (3), (4) and (7). Indeed, in the first column, a 1% increase in trade openness leads to a 0.674 percentage point increase in FFI. This means that trade openness has a direct positive effect on FFI in SSA, i.e., too much openness is conducive to the proliferation of illicit outflows either in the form of over-invoicing of imports or in the form of increased exports. This can be explained by the fact that trade openness increases the volume and complexity of international transactions, creating opportunities to conceal or divert funds through practices such as trade misinvoicing, improper profit transfer or money laundering. This can also be explained by the fact that trade openness increases exposure to external shocks, which may prompt economic agents to take their capital out of the country to protect themselves against risk or volatility. This result is in line with those of Ndiaye (2018), who finds that trade openness has a positive effect on FFIs in CEMAC countries. The author argues that trade openness increases vulnerability to exogenous shocks and favors illicit capital outflows as a means of tax evasion or flight from risk. Moreover, this is justified by the fact that IFFs are associated with trade and financial globalization, not least because of the potential for poor accounting practices, such as transfer mispricing (Asongu and Amankwah-Amoah, 2018; Ndikumana and Sarr, 2019). Our results are similar to those of other authors (Alemu,2018; Ndikumana,2014; Yelindé,2021).

As far as financial rating is concerned, it has a positive and significant effect on IFFs in all columns except the third and fourth. According to the first column, a one-unit improvement in a country's financial rating increases illicit financial flows by 53.3 percentage points at a significance level of 10%. This means that the better the country's financial rating, the higher the FFI. This may be explained by the fact that the financial rating reflects the country's creditworthiness, which may attract illicit financial flows from other, less creditworthy countries. This result is similar to that of Ndikumana and Boyce (2011), who found that financial rating is positively related to FFIs in Africa. However, these results are contrary to those of Alemu (2018) and Geda and Yimer (2016), according to whom the extent of financial sector development has a significant influence on FFIs. Indeed, a well-developed financial sector can have both positive and negative effects depending on banks' adherence to existing laws governing the transfer of funds out of and within the country. Although there is little literature to our knowledge on how banks actually operate as facilitators of illicit financial flows in SSA, there is evidence that banks play an active role in facilitating IFFs in SSA (Heggstad and Fjeldstad, 2010).

The public debt variable has a positive and significant coefficient in all specifications (1) to (7), suggesting that the more indebted a country is, the more it needs to resort to illicit financial flows to finance its deficit. However, this effect can be mitigated by financial rating, which has a positive and significant coefficient, implying that the better a country's reputation on the financial markets, the less it needs to resort to illicit financial flows. This result is in line with the hypothesis that illicit financial flows are motivated by the need for financing or the search for yield (Ndikumana and Boyce, 2011).

The exchange rate has an overall negative and significant effect on FFI in SSA. In the first column, a 1% improvement in the exchange rate leads, all other things being equal, to a 08.55 percentage point drop in FFI at the 1% threshold. This means that the higher the exchange rate, i.e. the more the national currency depreciates against the US dollar, the lower the FFI. This can be justified by the fact that the exchange rate affects the relative cost of illicit transactions between the country and the rest of the world. A high exchange rate makes illicit transactions more costly for agents who want to transfer capital abroad, and less profitable for agents who want to repatriate illicit capital. This result corroborates with those found by Orkho et al. (2018) and with that of Ndiaye and Siri (2018), who found that the exchange rate is negatively related to FFI in SSA.

Inflation, the interest rate differential, and resource rents have no statistically significant effects on FFI in SSA over the period from 2002 to 2018.

**Table 2:** Effects of institutional quality on illicit financial flows in SSA: GMM system

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Estimation method: GMM system** | | | | | | | |
| **Variable ofinterest: Illicit financial flows (log)** | | | | | | | |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| L.LnFFI | 0.362\*\*\* | 0.314\*\*\* | 0.280\*\*\* | 0.455\*\*\* | 0.682\*\*\* | 0.765\*\*\* | 0.535\*\*\* |
|  | (0.0800) | (0.0949) | (0.0642) | (0.0613) | (0.142) | (0.0885) | (0.0708) |
| Commercial opening | 0.00674\* | 0.00703\*\* | 0.00480\* | 0.00758\*\* | 0.00167 | 0.00170 | 0.00656\*\*\* |
|  | (0.00378) | (0.00292) | (0.00280) | (0.00381) | (0.00284) | (0.00227) | (0.00238) |
| Public debt (log) | 0.515\*\*\* | 0.545\*\*\* | 0.628\*\*\* | 0.458\*\*\* | 0.251\*\* | 0.203\*\*\* | 0.279\*\*\* |
|  | (0.0902) | (0.0984) | (0.0730) | (0.0638) | (0.117) | (0.0787) | (0.0611) |
| Income from natural resources | -0.0148 | -0.0109 | -0.0150 | -0.00408 | 0.00250 | -0.00627 | -0.00732\* |
|  | (0.0130) | (0.0125) | (0.0107) | (0.00779) | (0.00991) | (0.00738) | (0.00428) |
| Financial rating | 0.533\* | 0.482\*\* | 0.326 | 0.197 | 0.333\* | 0.558\*\* | 0.187\* |
|  | (0.286) | (0.232) | (0.230) | (0.160) | (0.180) | (0.240) | (0.0962) |
| Inflation | -0.000407 | -0.00198 | -0.000780 | -0.00542 | 0.00183 | 0.00832 | 0.00545 |
|  | (0.00662) | (0.00746) | (0.00758) | (0.00712) | (0.0103) | (0.00694) | (0.00717) |
| Exchange rates | -0.000381\*\*\* | -0.000308\*\*\* | -0.000303\*\*\* | -0.000213\*\*\* | -0.000225\*\*\* | -8.85e-05 | -5.63e-05 |
|  | (0.000131) | (0.000103) | (0.000105) | (5.56e-05) | (8.53e-05) | (0.000114) | (0.000106) |
| Interest rate differential | -0.00838 | -0.0111 | -0.00994 | -0.00229 | -0.00354 | -0.00637 | -0.0173\*\* |
|  | (0.0125) | (0.0126) | (0.0120) | (0.00988) | (0.00866) | (0.00873) | (0.00701) |
| Corporate quality | -0.790\*\*\* |  |  |  |  |  |  |
|  | (0.257) |  |  |  |  |  |  |
| Corruption control |  | -0.534\*\*\* |  |  |  |  |  |
|  |  | (0.147) |  |  |  |  |  |
| Government efficiency |  |  | -0.448\* |  |  |  |  |
|  |  |  | (0.259) |  |  |  |  |
| Voice and civic responsibility |  |  |  | -0.533\*\*\* |  |  |  |
|  |  |  |  | (0.167) |  |  |  |
| Rule of law |  |  |  |  | -0.321\* |  |  |
|  |  |  |  |  | (0.177) |  |  |
| Control quality |  |  |  |  |  | -0.719\* |  |
|  |  |  |  |  |  | (0.389) |  |
| Political stability |  |  |  |  |  |  | -0.433\*\* |
|  |  |  |  |  |  |  | (0.200) |
| Constant | -7.715\*\*\* | -7.714\*\*\* | -8.479\*\*\* | -6.357\*\*\* | -3.834\*\* | -4.495\*\*\* | -3.371\*\*\* |
|  | (1.667) | (1.745) | (1.499) | (0.888) | (1.628) | (1.522) | (0.763) |
| Comments | 356 | 356 | 356 | 356 | 356 | 368 | 362 |
| Number of countries | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Number of instruments | 21 | 21 | 21 | 23 | 19 | 19 | 21 |
| AR(1) test (p-value) | 0.019 | 0.018 | 0.022 | 0.029 | 0.048 | 0.020 | 0.028 |
| AR(2) test (p-value) | 0.667 | 0.619 | 0.789 | 0.427 | 0.336 | 0.182 | 0.266 |
| Hansen test (p-value) | 0.959 | 0.938 | 0.797 | 0.359 | 0.594 | 0.591 | 0.107 |

Note: Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: author based on GFI (2019) and World Bank (2022a, 2022b) data.

**5.2 Effect of institutional quality and its interaction with trade openness on FFI.**

The estimated coefficient of the interaction in Table 3 between institutional quality and trade openness is positive and significant at 1% in the first specification, meaning that the effect of institutional quality on FFIs depends on the trade openness of countries in the region. This suggests that the reducing effect of institutional quality on IFFs decreases with the degree of openness of African economies.

The effect of institutional quality on FFIs taking account of trade openness can be expressed by deriving in model 2 (equation 18) FFIs versus institutional quality. We then obtain :

(19)

The results obtained in Table 3 allow us to rewrite equation (19) by replacing the parameters with their values. Thus, we obtain with table (2)

(20)

This relationship makes it possible to determine the magnitude of the effect of institutional quality on FFIs, given a given level of trade openness. In the empirical literature, researchers generally choose between the median or the mean of the conditional variable to determine precisely this magnitude. In this research, we propose to choose the mean of trade openness to calculate this magnitude. According to Table l, the mean of trade openness is estimated at 63.351%. Thus, for a level of trade openness equal to 63.351%, when the quality of institutions improves by one unit, FFIs fall by is -01.091.

This result is in line with those of Ndiaye and Siri (2018), who find that the interaction between institutional quality and trade openness has a negative effect on FFIs in UEMOA countries. The authors explain that trade openness enhances institutional efficiency by promoting competition, transparency and international cooperation. This result is also in line with those of Ndikumana et al. (2015), who find that the interaction between institutional quality and trade openness has a negative effect on FFIs in Sub-Saharan Africa. The authors point out that trade openness reduces opportunities for over- or under-invoicing of trade, which is a major source of FFI.

**Table 3:** Effect of institutional quality and its interaction with trade openness on FFIs

|  |  |
| --- | --- |
|  | Estimation method: GMM system |
| Variable of interest: Illicit financial flows (log) | |
| VARIABLES | (1) |
| L.LnFFI | 1.136\*\*\* |
|  | (0.102) |
| Corporate quality | -1.795\*\*\* |
|  | (0.593) |
| QI\*OUV | 0.0201\*\*\* |
|  | (0.00661) |
| Commercial opening | 0.0111\*\* |
|  | (0.00480) |
| Public debt (log) | -0.0997 |
|  | (0.0780) |
| Income from natural resources | 0.00130 |
|  | (0.00673) |
| Financial rating | 0.148\*\*\* |
|  | (0.0537) |
| Inflation | 0.0199\* |
|  | (0.0114) |
| Exchange rates | -8.55e-05\*\*\* |
|  | (2.90e-05) |
| Interest rate differential | -0.00662 |
|  | (0.00680) |
| Constant | -0.433 |
|  | (0.879) |
| Number of instruments | 19 |
| AR(1) test (p-value) | 0.027 |
| AR(2) test (p-value) | 0.222 |
| Hansen test (p-value) | 0.559 |
| Comments | 368 |
| Number of countries | 23 |

Note: Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Source: author based on GFI (2019) and World Bank (2022) data.

**6. Conclusion and policy implications**

The aim of this research was to analyze the effects of institutional quality on FFI in SSA. On the one hand, the aim was to identify the specific forms of institutions that reduce FFI. Secondly, to examine the role of trade openness in the effect of institutional quality on FFI. To this end, it uses the system GMM method, on panel data from a sample of 23 countries observed over the period from 2002 to 2018. The results indicate that improving institutional quality reduces FFIs in the region. Indeed, a one-unit improvement in institutional quality leads to a 0.79% reduction in FFIs. In addition, specifically, control of corruption, political stability and citizen voice and accountability are the major specific forms of institutions that reduce FFIs in the region. In addition, the reducing effect of institutional quality on FFIs decreases with the degree of openness of African economies.

By way of economic policy implications, we suggest the following strategies for public authorities:

❖ Improving the fight against corruption and enhancing political stability and citizen voice and accountability are priorities for reducing FFI in SSA. These dimensions of governance are essential to strengthen the confidence of economic agents in the national economic and financial system, and to limit incentives to move capital out of the country illegally. Our results therefore call for fighting corruption, improving political stability and promoting democratic participation and control over public decisions.

❖ Policies aimed at controlled trade openness can, in a context of improving the quality of institutions, reduce FFIs. Improving the quality of institutions and controlled trade openness can help reduce FFIs.

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**Table A1: List of control variables and their definitions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Abbreviations** | **Definitions** | **Scale** | **Expe cted signs** | **Sources** |
| Corporate quality | IQ | Arithmetic average of thesix governanceindicators | -2,5 à 2,5 | Negative | WGI  (2022) |
| Controlling  corruption | Corr | Captures perceived levels of corruption, as determined by expert  assessments and opinion polls. Corruption is defined as the misuse of public power for privategain. | -2,5 à 2,5 | Negative | WGI  (2022) |
| Control quality | Rq | Captures perceptions of the government's ability to formulate and  implement sound policies and regulations that enable and promote private sector development. | -2,5 à 2,5 | Negative | WGI  (2022) |
| Rule of law | Rl | Captures perceptions ofthe extent to which agents trust and respect the  rules of society and thequality ofcontract enforcement, property rights, police and courts, as well as the likelihood of crime and violence. | -2,5 à 2,5 | Negative | WGI  (2022) |
| Voice and civic  responsibility | Go to | Captures perceptions of the extent to which a country's citizens can  participate in the selection of their government, as well as freedom of expression, freedom ofassociation and freedom of the media. | -2,5 à 2,5 | Negative | WGI  (2022) |
| Political stability  and absence of violence | Sp | Measures perceptions of the likelihood of political instability and/or  politically motivated violence, including terrorism. | -2,5 à 2,5 | Negative | WGI  (2022) |
| Government  efficiency | Ge | Captures perceptions of thequality of public services, the quality of the  civil service and its degree of independencefrom political pressures, the quality of policy formulation and implementation, and thecredibility of the government's commitment to these policies. | -2,5 à 2,5 | Negative | WGI  (2022) |
| Income from  natural resources | TrN | They represent thesum of oil rents, natural gas rents, coalrents, mineral  rents and forestry rents as a percentage of GDP. | % of GDP | Positive | WDI  (2022) |
| Public debt | Debt | It is taken in current USdollars, designates total debt service, the sum  of principal repayments and interest actually paid in foreign currency, goods or services on long-term debt, interest paid on short-term debt and repayments (redemptions and charges) to the IMF. The positive results were noted by Ndikumanaet al (2015) | US$  current | Positive | WDI  (2022) |
| Inflation | Inf | Inflation as measured by the consumer price index reflects the annual  percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or modified at specified intervals, such as once a year. | % annual | Positive | WDI  (2022) |
| Interest rate  differential | Eri | The interest rate spread is the interest rate charged by banks on loans to  private-sector customers minus the interest rate paid by commercial banks or similar institutions on sight, time orsavings deposits. | % of GDP | Positive | WDI  (2022) |
| Exchange rates | eT | The official exchange rate refers to theexchange rate determined by the  national authorities or the rate determined on the legally sanctioned foreign exchange market. | % of GDP | Positive /  Negative | WDI  (2022) |
| Commercial  opening | Ouv | It has a positive influence on economic growth, increasing real GDP per  capita mainly through its effect on productivity via competition. Openness facilitates cross-border trade transactions, allowing the structure of the economy to be reorganized, specializing in the production of goods forwhich one has a comparative advantage, which all other things being equal increases FFI traffic (GFI,2017). It is approximated here by the sum of exports and imports of goods and services, measured as a percentage of gross domestic product (WDI, 2021). | % of GDP | Positive | WDI  (2022) |
| Financial rating | Nf | This is an assessment of the structure of the financial sector and the  regulatory policies that affect it. Fora high scale of countries' financial sector, there is a significant influence on illicit financial outflows (Geda and Yimer, 2016). However, a well-developed financial sector can have both positive and negative effects, depending on banks' adherence to existing laws and rules governing thetransferof funds out of and into the country. Although there is little literature on how banks actually operate as facilitators of illicit financial flows in Africa, there is evidence that banks play an active role in facilitating capital flight from the continent (Heggstad and Fjeldstad, 2010). An increase in financial sector rating reduces IFFs according to the findings of Orkoh et al. (2017) | -6,5 à 6,5 | Positive /  Negative | WDI  (2022) |

## Table A2: Correlation matrix of governance indicators

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | Institutional Quality | Corruption Control | Government efficiency | Voice and civic responsibility | rule of law | Control quality | Political stability |
| Institutional Quality | 1.0000 |  |  |  |  |  |  |
| Corruption Control | 0.9032 | 1.0000 |  |  |  |  |  |
| Government efficiency | 0.8552 | 0.8228 | 1.0000 |  |  |  |  |
| Voice and civic responsibility | 0.8501 | 0.6428 | 0.5269 | 1.0000 |  |  |  |
| rule of law | 0.9450 | 0.9043 | 0.8612 | 0.7021 | 1.0000 |  |  |
| Control quality | 0.8257 | 0.7677 | 0.8673 | 0.5185 | 0.8430 | 1.0000 |  |
| Political stability | 0.8657 | 0.6761 | 0.5700 | 0.8920 | 0.7247 | 0.5082 | 1.0000 |

Note: \*\*\*p<0 ,01 significance at 1%.

Source: authors based on data from GFI (2019) and the World Bank (2022a,b)

## Table A3: Correlation matrix of control variables

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | Illicit financial flows | Corporate quality | Commercial opening | Public debt | Income from natural resources | Financial rating | Inflation | Exchange rates | Interest rate differential |
|  |  |  |  |  |  |  |  |  |  |
| Illicit financial flows | 1 |  |  |  |  |  |  |  |  |
| Corporate quality | -0,0363 | 1 |  |  |  |  |  |  |  |
| Commercial opening | 0,0474 | 0,3543 | 1 |  |  |  |  |  |  |
| Public debt | 0,7884 | -0,0612 | 0,0162 | 1 |  |  |  |  |  |
| Income from natural resources | -0,0309 | -0,2249 | 0,2131 | 0,1111 | 1 |  |  |  |  |
| Financial rating | 0,102 | 0,5259 | 0,0109 | 0,1379 | -0,1425 | 1 |  |  |  |
| Inflation | 0,1115 | -0,1496 | 0,1105 | 0,2054 | 0,2875 | -0,0159 | 1 |  |  |
| Exchange rates | -0,1577 | -0,2255 | -0,145 | -0,2069 | 0,0232 | -0,1577 | 0,0056 | 1 |  |
| Interest rate differential | -0,0746 | -0,0917 | 0,1223 | 0,0177 | 0,2029 | -0,0713 | 0,5105 | 0,2141 | 1 |

Note: \*\*\*p<0 ,01 significance at 1%.

Source: authors based on data from GFI (2019) and the World Bank (2022a,b)

1. Illicit financial flows are different from capital flight in that capital flight includes both licit and illicit capital (Kar and Spanjers, 2015). Legal capital flight is recorded and tracked, which greatly reduces the likelihood that it has a corrupt or criminal source. In contrast, IFFs are by nature unregistered and cannot be used as public funds or private investment capital in their country of origin (Kar and Spanjers, 2014). If the flow breaks any law at any time, it is considered illicit. [↑](#footnote-ref-1)
2. These flows contravene the laws in force, and therefore have no paper trail for the most part. [↑](#footnote-ref-2)
3. See Le and Zak, (2006) for a development of the econometric details of equation (3). [↑](#footnote-ref-3)
4. Given the existence of such an environment, individuals are more likely to discount the future of funds on domestic markets and move them more abroad. [↑](#footnote-ref-4)
5. log a+b=log (a\*(1+ba)) =log a+log (1+ba) .The second term on the right-hand side of the equation can be 22a2 + e33a3+... approximated using Taylor series expansion, log 1+ba=ba-b [↑](#footnote-ref-5)
6. When institutional quality is low, it can generate negative externalities. [↑](#footnote-ref-6)
7. When institutional quality is high, it can generate positive externalities. [↑](#footnote-ref-7)
8. Sample countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cape Verde, Comoros, Côte d'Ivoire, Gambia, Kenya, Lesotho, Madagascar, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Zimbabwe. [↑](#footnote-ref-8)
9. Cuddington (1986), refers to "speculative (narrow) money", which corresponds to the net entry of errors and omissions in balance of payments statistics (a consistently high and negative net value of errors and omissions is considered a sign of illicit capital flows). [↑](#footnote-ref-9)
10. Comparing the use and source of a country's funds within a macroeconomic framework, any inflow of funds that exceeds its stated use is considered unallocated capital and therefore illicit financial flows (Boyce, J. K. and L. Ndikumana., 2001). [↑](#footnote-ref-10)
11. consists of comparing FOB values (Free on Board: i.e. the transaction value of the goods and the value of the services provided to deliver the goods to the border of the exporting country (United Nations, 2013)) and CIF values (Cost of Insurance and Freight: the value of services provided to deliver the goods from the border of the exporting country to the border of the importing country (United Nations, 2013)) and any positive difference greater than 10% of a country is then interpreted as a quantitative estimate of unrecorded capital outflows between partner countries (BCEAO, 2013; Kar and Cartwright-Smith, 2009). [↑](#footnote-ref-11)
12. A scale (-2.5 low and 2.5 high) [↑](#footnote-ref-12)