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**College of Business and Economics**

**School of Graduate Studies**

**The Political and Economic Determinants of Parallel  
Foreign Exchange Markets: The Case of Selected African  
Countries**

By:

Wondimu Manaye

A thesis submitted to the Department of Economics in the  
Partial Fulfillment of the Requirements for the Degree of Master  
of Science in Economics (International Economics)

Addis Ababa University

Addis Ababa, Ethiopia

December, 2024

**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF BUSINESS AND ECONOMICS**  
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By: Wondimu Manaye Mecho

Advisor: Jonse Bane (Ph.D)

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## **Dedication**

In the quiet moments, I hear your voice, Mom. This work is a whisper of your love, a testament to your legacy.

**Menbere Kara**

## **Declaration**

I, Wondimu Manaye, declare that this thesis entitled “The Political and Economic Determinants of Parallel Foreign Exchange Markets: The Case of Selected African Countries” is an outcome of my effort except those which are duly cited and quoted. This study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the degree of Masters of Science in Economics: Specialization in International Economics.

### **Declared by:**

Name: Wondimu Manaye

Signature ----- Date -----

### **Confirmed by Advisor:**

Name: Jonse Bane (Ph.D)

Signature ----- Date -----

Place and date of submission: Addis Ababa University December 2024

**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF BUSINESS AND ECONOMICS**

**Department of Economics**

**Thesis Approval Sheet**

This is to certify that the thesis prepared by Wondimu Manaye, entitled: **The Political and Economic Determinants of Parallel Foreign Exchange Markets: The case of selected African countries** and submitted in partial fulfillment of the requirements for the Degree of Masters of Science in Economics (International Economics) complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

**Approved by the Examining Committee**

**Abdurezack Hussein (Ph.D)**

**Name of Internal Examiner**

\_\_\_\_\_  
**Signature**

**Migbaru Alamirew (Ph.D)**

**Name of External Examiner**

  
\_\_\_\_\_  
**Signature**

**Jonse Bane (Ph.D)**

**Advisor**

\_\_\_\_\_  
**Signature**

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**Chair of the Department or Graduate Program Coordinator**

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## List of Acronyms

2SLS	Two Stage Least Square
ADF	Augmented Dickey-Fuller
AML	Anti-Money Laundering
BOP	Balance of Payment
CPI	Consumer Price Index
CLRM	Classical Linear Regression Model
CTF	Counter-Terrorist Financing
EMDE	Emerging and Developing Economies
GDP	Gross Domestic Product
GMM	the Generalized Method of Moments
FATF	Financial Action Task Force
IMF	International Monetary Fund
IV	Instrumental Variable
IPS	Im-Pesaran-Shin
LLC	Levin-Lin-Chu
LLMIC	Low- and Lower-Middle-Income Countries
OECD	The Organization for Economic Cooperation and Development
OLS	Ordinary Least Square
PEM	Parallel Exchange Market
PEMP	Parallel Exchange Market Premium
PSAV	Political Stability and Absence of Violence
SSA	Sub-Saharan Africa
UNCOMTRADE	United Nations Commodity Trade
UNCTAD	United Nations Conference on Trade and Development
VIF	Variance Inflation Factor
WB	World Bank

## **Abstract**

*This study aims at investigating the political and economic determinants of parallel foreign exchange market premium using panel data (gathered from the WB, IMF, UNCTAD and central banks) from 24 sub-saharan African countries with period from 2006 to 2023. The study applied a random effect panel data model to address its objectives. Results indicate that political stability and absence of violence, remittance inflow and foreign aid are negatively associated with parallel foreign exchange market premiums in SSA. Devaluation and corruption are not significantly associated with foreign exchange market premiums. The policy implication of the study is that better political stability and reducing violence could be one mechanism to reduce the discrepancy in exchange rates between official and parallel, to maximize the impact of Aid on the PEMP, recipient countries can improve transparency and accountability in aid management and Policymakers should develop policies that encourage and facilitate remittance inflows and explore ways to encourage and facilitate the flow of remittances into the country through legal channels.*

**Keywords:** *Parallel Foreign Exchange Market, Corruption, Political Stability, and Absence of Violence*

# **Chapter One:**

## **Introduction**

### **1.1 Background of the Study**

A system of parallel foreign currency markets occurs when two exchange rates that are nominal and significantly different from each other are in effect at the same time in an economy. The official exchange rate, which is set by law, is usually one of them, and the other is a freely floating, market-determined "parallel" exchange rate. Authorities that set significant limitations on the amount or cost at which official foreign exchange transactions can occur usually give rise to parallel markets. In theory, there are situations in which a system of parallel exchange rates would be advantageous. For example, it can help keep current account transactions stable (at the official rate) and safeguard terms of trade and, thus, import and export variations from unpredictable fluctuations in the capital account (at the parallel rate) and financial markets (IMF, 2018).

Parallel foreign exchange markets (PEM) refer to the existence of multiple exchange rates for a single currency within a country. These markets typically emerge in countries where there are restrictions on foreign exchange transactions, capital controls, or when official exchange rates are perceived as overvalued or manipulated. In such cases, parallel markets provide an alternative channel for individuals and businesses to access foreign currencies they provide avenues for hedging against exchange rate risk, facilitating cross-border trade, and enabling capital flight. Moreover, PEMs can also serve as indicators of the underlying economic conditions and confidence in a country's official exchange rate regime (Han, 2020).

The Key Features of Parallel Markets are: Informal and Unregulated: Transactions occur outside the official banking system, making them difficult to track and regulate (Mody, 2001). The parallel market carries a higher risk of fraud and theft compared to the official system (Egert et al., 2013). The parallel market frequently mirrors real market dynamics despite risks, offering a more accurate picture of the domestic currency's value (Aasha et al., 2016). Several factors motivate individuals and businesses to utilize the parallel market. One of the desires

individuals have for a parallel market is access to Foreign Currency: When official channels limit access, the parallel market becomes the only viable option to meet foreign exchange needs for imports, travel, or investment (Calvo-Gonzalez et al, 2007). The other is Profit Seeking. Individuals with access to foreign currency can profit from the the difference in exchange rates between the parallel and official markets (Egert et al., 2013). The parallel market will be utilized by people as a hedge against devaluation. Businesses and individuals can use the parallel market as a hedge against the official currency rate's predicted depreciation (Aasha et al., 2016).

The emergence of parallel foreign exchange markets can be traced back to instances of government-imposed restrictions on official currency exchange. These restrictions might be motivated by a desire to Control Capital Flight, Limit the outflow of domestic currency to maintain foreign exchange reserves, Maintain Fixed Exchange Rates, and Peg the domestic currency to a stronger foreign currency despite underlying economic pressures. When official access to foreign currency becomes limited, individuals and businesses turn to alternative avenues to fulfill their foreign exchange needs. This gives rise to the parallel market, where exchange rates are determined by supply and demand, often deviating significantly from the official rate. (Calvo-Gonzalez & Vélez, 2005).

The issue of foreign exchange shortages is influenced by a wide range of circumstances that can also lead to corruption and its consequences. The gap between the supply and demand of foreign exchange is caused by government involvement in the market through rate pegs. The government cannot determine the market clearing peg rate a priori since it is not omniscient. The policy invariably results in an excess demand for foreign exchange since it sets the official (pegged) exchange rate lower than the equilibrium exchange rate. There will be an additional foreign exchange market to handle this surplus demand. The participants in the black market are breaking the law, and they risk punishment if caught. Rents or intra-marginal returns are required for illicit (corrupt) sales of foreign exchange to take place. The difference (premium) between the official (or bid) foreign currency rate and the rate on the parallel market represents these rents (Patterson, 2001).

The existence of a large and active parallel market can negatively impact economic stability. By investigating the factors that determine exchange rates in the parallel market, policymakers can

identify underlying issues, Understanding the determinants can reveal underlying economic problems, such as inflation or currency misalignment, that contribute to the thriving parallel market (Aasha et al., 2016). This knowledge can be used to design policies aimed at reducing the premium between official and parallel rates, ultimately leading to a more efficient and stable foreign exchange system (Calvo-Gonzalez et al 2007).

In order for economies to function properly, foreign exchange markets are essential, and its efficiency and stability are important for economic growth and development. Therefore, understanding the determinants of parallel foreign exchange markets is essential for policymakers and investors (Han, 2020). This research on the determinants of the PEM builds upon the existing body of literature that explores the economic consequences and policy challenges associated with these informal currency exchange systems.

## **1.2 Statement of the Problem**

Governments in many developing nations apply trade and capital flow restrictions in an attempt to curb the excess demand for foreign currencies. Central banks typically set the exchange rate at an officially fixed level and mandate that all market players trade at those fixed rates when they impose controls. They also provide criteria for distributing their restricted foreign exchange. As a result, individuals who require foreign currency and whose requests are not met are forced to participate in either the parallel or black markets, which are both illegal and operate at rates significantly higher than the government's official exchange rate (Bahmani-Oskooee & Goswami, 2005)

It is well known that government policies create market distortions that can lead illegal activities, which undermine investment and economic growth. It's important to note that the specific impact of government policies on market distortions and illegal activities can vary depending on the context and the particular policies implemented. However, the general principle that government intervention can have unintended consequences, including the creation of opportunities for illegal activities, is widely recognized in the field of economics and political science. It is the monopoly power of government that makes corruption possible by creating the rent or intra-marginal return opportunity in the country. In general, government regulations can lead prices to diverge from the competitive market-clearing price, laying the groundwork for corruption.

Corruption has many causes and repercussions that are as serious as the problem of foreign exchange shortages (Pettersen, 2001).

The economics of parallel exchange rates are straightforward: they are costly, extremely distorting for all parties involved in the market, linked to increased inflation, impeding foreign investment and the expansion of the private sector. The group that gains from subsidized foreign exchange is the one that pays for it; everyone else does not. As a result, there is a strong link, if not a causal relationship, between corruption and parallel rates (David, 2023).

The empirical evidence for the Sub-Saharan African experience is rather sparse, even though it is well known that several of the region's nations have bustling parallel foreign currency markets with large markups. Numerous sub-Saharan African nations (outside the Franco zone) have traditionally had higher premiums compared to other developing nations

(World Bank, 1994). Considering that the size of the premium indicates the significance of parallel markets in several of the region's countries as well as their potential influence on the region's overall economic activity (Yiheyis, 1997), It would be beneficial to make an effort to pinpoint the economic variables that account for the variations in premiums within and between nations.

Oluremi (2020) conducted a research to study the determinants of PEMP on the developing countries and found that Corrupt practices have been to be crucial factors in short-term fluctuations in the nominal exchange rate. Even in the long run, corruption could still play a very important role. Some advanced developing countries may have developed a more effective legal system to curb corrupt practices. The exchange rate system of these countries may also not have the rigorous parallel market practices that characterize the exchange rate system of less advanced developing countries.

A research paper on the factors influencing the macroeconomic effects of Sudan's PEM was produced by Ebaidalla Mahjoub Ebaidalla in 2017. The empirical study shows that exchange rate premiums are negatively and significantly impacted in the short and long terms by the international reserve, GDP growth, trade openness, foreign aid, and real exchange rate. However, it is discovered that the money supply and the anticipated pace of devaluation have a positive and large impact on exchange rate premiums.

Derrese (2001) found that In Ethiopia, the balance of the real money, the real exchange rate, and foreign aid (grants) were the main factors determining parallel rates in the long run, but trade terms had a significant negative impact only on taxes in the short term. Furthermore, given the time period under consideration, a parallel exchange rate is typically attributed to inflation.

Understanding the factors that determine exchange rates in the parallel market is crucial for overcoming Market inefficiency (Aasha, Iqbal, & Hussain, 2016), uncertainty and risk (Egert, Farooq, & Irwin, 2013), policy ineffectiveness (Calvo-Gonzalez & Santos, 2017) and Macroeconomic Instability (Mody, 2001). By identifying these determinants Policymakers can design strategies to reduce the premium between official and parallel rates. This can involve addressing underlying economic issues, such as inflation or currency misalignment, or making the official market more accessible and attractive (Aasha et al., 2016). An improved understanding of the determinants of parallel market exchange rates can contribute to the development of more accurate and robust economic models. These models can then be used to predict foreign exchange fluctuations and their impact on the broader economy (Egert et al., 2013). By understanding the factors influencing the parallel market, businesses and individuals can make informed decisions about currency exchange. This knowledge can help them navigate the risks associated with the parallel market and minimize potential losses (Calvo-Gonzalez & Santos, 2017).

Existing literature often focuses on PEMP in Asia, Latin America, or Eastern Europe (Agenor, 1992; Calvo-Gonzalez & Santos, 2017). Dedicated studies on the determinants of the premium in Africa are scarce, hindering the understanding of the continent's specific dynamics. Understanding the specific determinants of the PEMP in Africa is crucial for designing effective policies. Research is needed to explore how policy interventions, such as exchange rate management adjustments, capital control relaxations, or financial inclusion initiatives, might influence the premium and promote a more efficient foreign exchange system (Calvo-Gonzalez & Santos, 2017).

There is a scarcity of researches on parallel market determinations, specially focusing on Political Stability and Absence of Violence. This paper had tried to address the issue by the investigating the determinants of Parallel foreign exchange markets by making Political Stability and Absence of Violence as a control variable. Because investigating the determinants of the

PEM is essential for promoting a more stable, efficient, and predictable foreign exchange system. This, in turn, can contribute to greater economic stability and growth.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective**

Generally, the study sought to pinpoint the reasons why there is a price difference between the official and parallel exchange rates.

#### **1.3.2 Specific objectives**

It specifically focused on

1. Identify the key political factors that influence the emergence and operation of parallel foreign exchange markets in the selected African countries. These factors include: Corruption and Political Stability and Absence of Violence/Terrorism
2. Identify the economic factors that contribute to the development and dynamics of parallel foreign exchange markets in the selected countries. These factors include: Balance of Payment, Devaluation, Inflation, Aid, Broad Money Supply, Official Interest Rate, GDP, Real Exchange Rate and Remittance.

### **1.4 Significance of the Study**

There is a dearth of research investigating the factors influencing PEMP in Africa, especially those using panel data. This study aims to fill this gap and offer the latest insights into the sector's performance. Because this study aims to investigate the factors influencing PEMPs, it will offer practical tools for shaping monetary and trade policies. By filling this research gap, we can gain a deeper understanding of the specific factors driving PEMP in Africa. This knowledge can inform policymakers on how to: Address the underlying economic issues contributing to the premium, Develop targeted strategies to reduce the premium and promote greater use of the official foreign exchange market, and Enhance economic stability and financial inclusion across the continent. The study's results will be applied to forecasting and policy simulation. Moreover, it will be a reference point for future research.

## **1.5 Justification of the Study**

IMF, 2023 reported Ethiopia, Nigeria, Sierra Leone, Zimbabwe, Algeria, Burundi, Sudan, and Zambia are among the Nations that have more than 50% of Parallel Premium in current years. According to The International Monetary Fund Lebanon's currency peg (from 2020-2023) to the US dollar became unsustainable, leading to a massive devaluation in the parallel market. IMF identified widespread corruption as a key factor hindering economic reforms and access to foreign currency source. Corruption and PEMs are intricately linked, with negative consequences for economies. Corruption and parallel markets are unfortunately intertwined in many African countries. And there are several African countries which are encountering parallel markets in current years. Hence, examining the magnitude of corruption and other factors on PEMs in Africa is crucial. Considering the aforementioned evidence and Justifications these (Algeria, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo DR, Congo Republic, Ethiopia, Gambia, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Malawi, Mauritania, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, Sudan and Zambia) countries were selected for this study.

## **1.6 Limitations and Scope of the Study**

Like any empirical study, this research has limitations. While analyzing data in a panel setting provides more insights from a group of units over time compared to cross-sectional or time series studies, including diverse units can affect the results. This is because the individual units within the group have varying characteristics. Similar to many other studies conducted in most African countries, this research faced the issue of data. Obtaining reliable data on the size and activity of parallel markets in Africa, and the true premium is difficult (Egert et al., 2013). New methodologies and data collection techniques are needed to gain a more accurate picture and understand the factors driving the premium across different African contexts. The availability of data is restricted to certain countries, time periods, and specific areas of interest. Consequently, the study's time frame and sample countries were determined by data accessibility. The scope of the research was also influenced by data availability and accessibility. It examined the political and economic factors driving PEMP in selected African countries from 2006 to 2023.

## **1.7 Organization of the Paper**

The subsequent chapters are organized as follows: Chapter two offers a brief overview of the concepts and development of parallel foreign exchange markets, emphasizing the main determinants of the parallel foreign exchange rate in developing countries. Chapter three delves into econometric models, methodology, and data definitions. Chapter four presents the econometric results, and Chapter five provides the conclusion and recommendations.

## **Chapter Two:**

### **Review of Related Literature**

#### **2.1 Definition and Development of Parallel Foreign Exchange Market**

A PEM system has two different exchange rates—a freely floating market rate and an official rate established by the government—operating concurrently in the economy. When governments set stringent restrictions on official foreign exchange transactions, parallel markets frequently develop. While there are benefits to a PEM system, such as stabilizing current account transactions and shielding trade terms from erratic financial markets, it's crucial to take into account any potential disadvantages as well as the particular environment in which it is used (IMF, 2022).

In developing nations, parallel foreign exchange systems: where one or more fixed or regulated exchange rates coexist with a market-determined exchange rate are very common. Governments may establish a legal parallel exchange market to address balance of payments issues. This aims to protect domestic prices from short-term exchange rate fluctuations while managing capital outflows and foreign exchange reserves. However, strict foreign exchange controls can also lead to the emergence of illegal parallel markets. The underground market subsequently becomes more important as the government increases and tightens regulations in response to a worsening balance of payments rather than reducing overall spending or depreciating the official currency rate, or both (Kiguel and O'Connell, 1995).

In developing countries, there are frequently PEMs with parallel exchange rates that may differ significantly from official rates. The sorts of transactions subject to exchange laws and the degree to which these limits are enforced by the authorities influence the size of this market, which differs by country. Only in countries where there is minimal demand rationing on the official foreign exchange market will the parallel market be relatively prominent. Parallel currency markets, on the other hand, are typically well-established and structured, in nations where the central bank lacks the reserves (or borrowing ability) to meet demand and balance of payments deficits are persistent, with an exchange rate that is significantly more depreciated than the official rate (Agenor, 1992).

The parallel or nominal exchange rate, whether on its own or in relation to the actual exchange rate, is a strong economic policy instrument since it effects resource allocation, international trade growth, and structural change. It is about the most significant relative price influencing almost all other prices in a market economy. As a result, it merits careful consideration, particularly while making decisions (Ogun, 2020).

The recent deterioration of economic conditions and the growing pressure on developing countries to weaken their currencies have led to an increase in the number of countries with active parallel currency markets. There are now about 24 developing and emerging economies (EMDEs) with functioning parallel currency markets. The gap between the official and parallel rates, or the exchange rate premium, is greater than 10% for at least 14 of them (WB, 2023). Parallel markets typically emerge when there's excess demand for a product that faces legal sales restrictions or price controls. In many developing countries, foreign exchange transactions are subject to both types of limitations (IMF Annual Report on Exchange Restrictions).

Typically, the central bank determines the official exchange rate, and only a select group of middlemen are authorized to handle currency exchanges. Domestic agents often face restrictions on foreign exchange purchases for non-essential purposes. To meet excess demand, a portion of the foreign exchange supply is illegally sold at a premium. Many economists believe that attempts to fix asset prices lead to parallel markets. When the official exchange rate is below the market-clearing rate, supply decreases due to restrictions. This creates surplus demand, allowing sellers to profit by trading at higher rates.

## **2.2 Determinants of Parallel Foreign Exchange Market Premium**

Three categories were established by Nkurunziza (2002) to analyze the premium on the illegal market. First of all, the "real trading" approach highlights the reality that a parallel market primarily functions for business needs. Second, to describe the parallel market, the monetary approach concentrates on monetary factors. Finally, the currency substitution strategy, also known as the portfolio balance approach, is predicated on the idea that agents use the parallel market to change the percentage of foreign and local currency in their holdings.

Determinants of PEMs in African countries are influenced by various factors. Some of the key determinants include, First, Economic stability and macroeconomic factors:- The overall stability

of the economy, including inflation rates, fiscal policies, and government interventions in the Forex market can significantly impact the functioning and dynamics of PEMs in African countries (Zhu et al., 2022). Second, External factors:- Global economic conditions, commodity prices, and international trade relationships can also have a significant impact on parallel foreign exchange markets in African countries. These external factors can influence the supply and demand for foreign currencies, leading to fluctuations in parallel exchange rates. The third one is informal economies and black market activities: In many African countries, Parallel foreign currency markets heavily rely on the informal economy and black market operations. These underground economies provide alternative channels for individuals and businesses to access foreign currencies, bypassing formal regulations and restrictions. (Han, 2020)

### **2.2.1 Political Stability and Absence of Violence/ Terrorism**

The index of Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. The index is an average of several other indexes from the Economist Intelligence Unit, the World Economic Forum, and the Political Risk Services. The index is a composite measure as it is based on several other indexes from multiple sources including the Economist Intelligence Unit, the World Economic Forum, and the Political Risk Services, among others. The underlying indexes reflect the likelihood of a disorderly transfer of government power, armed conflict, violent demonstrations, social unrest, international tensions, terrorism, as well as ethnic, religious or regional conflicts (World Bank).

Political stability is characterized by a low incidence of politically motivated violence, including coups, social unrest, and revolts (Caniklioğlu, 1999). While maintaining the status quo in political institutions might seem stable, it does not guarantee true stability. The World Bank defines political stability as the perception of a government's resistance to unconstitutional or violent overthrow, including terrorism (Worldwide Governance Indicators, 2022). Traditional models of exchange rate regime choice, such as those of Obstfeld and Rogoff (1995), primarily focused on economic factors in developed countries. However, recent research by Stein and Jorge (2004) and Markiewicz (2006) highlights the significant influence of domestic political factors on these decisions. While economic considerations remain important, the political

landscape, including interest groups, electoral dynamics, and government priorities, plays a crucial role in shaping exchange rate policy choices.

A nation's political climate now has a big impact on financial and investment activity, even those carried out through financial markets and institutions. "Political risk" is becoming a more popular term as the globe moves closer to the fourth industrial revolution and financial markets grow more interconnected. Political risk can have a detrimental impact on investment terms and conditions, which is why some investors and firm managers grasp how important it is to comprehend it, while others are hesitant (Benedict et al., 2022).

Alesina and Wagner (2006) investigated the link between exchange rate regimes and economic growth, considering the quality of a country's institutions. Building on Reinhart and Rogoff's (2004) classification, they found a U-shaped relationship between corruption and exchange rate fixity. In highly corrupt environments, a fixed exchange rate regime can initially hinder economic growth, but beyond a certain level of corruption, it becomes more suitable. Conversely, countries with strong institutions tend to favor flexible exchange rate regimes. This suggests that countries with good institutions can tolerate exchange rate flexibility, while those with weak institutions may benefit from a fixed exchange rate regime.

The type of political system, whether democratic or autocratic, can influence a country's choice of exchange rate regime. Recent research suggests that democracies tend to favor flexible exchange rate regimes for two reasons: the ability to pursue independent monetary policies for domestic economic goals and the transparency of monetary commitments and the political system (Broz, 2002; Steinberg et al., 2015). Conversely, autocratic regimes, often lacking credibility with investors due to their lack of political transparency and legitimacy, may prefer fixed exchange rate regimes to enhance their credibility.

### **2.2.2 Corruption**

The Corruption Perceptions Index (CPI) for 2023 in Africa reveals a range of outcomes, with notable improvements in a few nations. Despite some progress, most African countries remained stagnant, maintaining the region's consistently low performance and an average score of 33 out of 100. Ninety percent of Sub-Saharan African nations scored below fifty. Sub-Saharan Africa's economy grew at a 3.3% annual rate in 2023, but the region's 462 million people still live in

abject poverty. The chronic problems facing the region are caused by decades of gross underfunding of the public sectors, which is made worse by corruption and money laundering that diverts funds from essential public services. It is still ineffective to address social and economic problems, frequently at the price of the most vulnerable people. The poorest residents and those who rely largely on public services, including women and children or people with disabilities, are disproportionately affected by corruption in the justice delivery system, which makes it more difficult to achieve regional and global development goals (CPI 2023 for Sub-Saharan Africa).

Bahmani-Oskooee & Goswami, 2005 (2005) looked into how corruption affected the premium on the illicit market. They contend that corruption may, in theory, both raise the supply and demand for foreign currency on the underground market. It may therefore have a favorable or unfavorable effect on the black market premium. The premium rises if corruption leads to an excess of demand for foreign currencies on the illicit market. If not, it could make it less.

Corruption is a common problem in many countries, especially emerging ones, affecting both government and businesses. Various factors influence a country's corruption level, such as education, political rights, competition, civil service salaries, and more. Recent research in economics has focused on understanding how corruption impacts different macroeconomic variables and sectors of an economy (Bahmani-Oskooee & Goswami, 2005).

To show the empirical validity of their novel proposal, Juan P, Farah Y. et al (2022), have taken a simple model from the literature and added a measure of corruption as an extra element determining the premium. The model was estimated using yearly cross-sectional data from 60 developing countries between 1982 and 1995. In half of the cases, they found evidence that higher degrees of corruption are associated with larger premiums on the illicit market. They found more proof for their idea when they shifted to a panel analysis and estimated the model by combining data from 60 countries over the years 1982–1995. Numerous research that show how corrupt activities can flourish in parallel marketplaces can be found across the literature. The 2020 Worldwide Governance Indicators list 209 nations and territories, of the 28 that presently have exchange rate markets operating in parallel markets.

## **2.2.3 Other Determinants**

### ***2.2.3.1 Gross Domestic Product (GDP)***

According to economic theory, monetary and fiscal policies, as well as unforeseen fluctuations in exchange rates, can all have an impact on economic growth. These policies are reflected in government expenditure and the money supply, with expansionary measures meant to boost demand. Furthermore, supply-side variables show how changes in exchange rates affect economic production.

### ***2.2.3.2 Real exchange rate***

In reality, though, parallel exchange rates have seldom been advantageous in developing nations. Rather, economies with PEMs typically experience lower macroeconomic results and more uncertainty (IMF, 2018). This is mostly due to the fact that parallel markets cause substantial obstacles to the effective allocation of resources and distort economic prices. Depending on access to the official foreign exchange market, it creates significant implicit taxes and subsidies in the economy, which in turn encourage rent-seeking and misreporting (for example, of export revenues). For example, Burundi's GDP was estimated to be implicitly taxed by exporters to the tune of 3.6% due to exchange rate restrictions. Furthermore, as the currency rate plays a significant role in the transmission of monetary policy, parallel markets also have an impact on the effectiveness of monetary policy. A real exchange rate index is frequently used to assess if an exchange is appropriate (IMF, 2022)

### ***2.2.3.3 Inflation***

According to neo-classicalist theory, inflation has two effects on the foreign exchange parallel market. First, it leads to a growing overvaluation of the fixed nominal exchange rate, which in turn expands the size of the parallel market. Second, inflation causes capital flight by lowering real domestic interest rates. In this sense, the parallel exchange rate may rise as a result of inflation (Degefa, 2001). A rise in the demand for money due to the higher cost of foreign exchange in domestic currency will result in an increase in domestic prices, according to the structuralist school of thinking, if the official exchange rate devalues or the parallel exchange rate rises.

Historically, the economic performance of nations with PEMs has been extraordinary in a bad manner. This group is characterized by sluggish growth, high and persistent inflation, and weak corruption control. Parallel markets are born when capital controls are imposed, usually in reaction to a negative shock or a significant decline in the state of the economy. However, the absence of readily available foreign currency is the primary factor behind the establishment and continuation of parallel or underground markets, and the outcome is frequently distorting, regardless of the background or underlying cause. The emergence of parallel marketplaces is more concerning. The amount of PEMs that are currently operational in nearly a fifth (28) of emerging and developing economies (EMDEs) is the greatest in more than 20 years. The COVID-19 pandemic has led to an increase in parallel markets because to its early influence on commodity prices and longer-lasting supply chain disruptions for essential products and services (Juan P, Farah Y. et al, 2022).

Poor performance in terms of growth, inflation, corruption control, and possibly many other economic and socio-political characteristics is a hindrance to equitable growth and development, both nationally and internationally. The historical record of inflation in nations having parallel currency markets is equally horrifying: between 1970 and 2001, the average rate of inflation in nations with parallel markets was six times greater than that of those with unified rates. Parallel markets have consistently seen sustained capital flight, especially during times of increased premia. However, a common argument against altering the existing quo is the worry that unification of currency rates will cause inflation to soar. Although these worries have some merit, they are usually exaggerated because of the short-term nature of the effects. Furthermore, the longer parallel markets exist, the more difficult and expensive it is to repair the economic imbalances they generate. (Juan P, Farah Y. et al, 2022).

#### **2.2.3.4 Remittance**

There are acceptable applications for the hawala system, such as international money transfers in nations with inadequate formal banking infrastructure (Abouzied, 2023). But it's also employed for illegal activities like financing terrorists and money laundering (Wheatley, 2005). Because the Hawala system is informal, it is challenging for governments to properly control and oversee its operations.

Hawala networks have unique challenges, such as the following: the inability to monitor transactions, the difficulty in identifying the parties to a transaction, and the possibility of exploitation by terrorists and criminals (Passas, 2005). Hawala and other comparable service providers have historically been exempt from regulatory control in the majority of countries. It is unlikely that the informal sector will be successfully regulated, especially if it is not consulted (Qorchi et al., 2003).

The difficulty for policymakers is to strike a balance between the necessity to control the hawala system to stop illegal activity and the need to protect genuine users (Abouzied, 2023). Formalizing the hawala system by placing it under the official financial sector's regulatory purview is one possible regulatory approach. In order to do this, the hawala system would have to abide by the same rules as conventional financial institutions, including those pertaining to counter-terrorist financing (CTF) and anti-money laundering (AML) (Wheatley, 2005; FATF, 2014).

### **2.3 Empirical Literature**

The results of the OLS estimation of the study (Degefa, 2001), which was conducted using monthly data (1993(5)–1997(12)) as well as annual data (1966–1996), The study demonstrates that the parallel premium significantly hinders merchandise exports, both in the short and long term. This suggests that the parallel premium significantly affects exports in general and merchandise exports specifically. While real money balance, real exchange rate, and foreign aid (grants) are identified as the primary long-term determinants of Ethiopia's parallel premium, terms of trade are found to have a significant short-term negative impact on the premium. Additionally, it is typically seen that the parallel exchange rate for the time period under short run. Moreover, it is typically discovered that the parallel exchange rate during the time period under investigation results from inflation. Thus, in order to prevent the effects of the parallel premium on macroeconomic variables, which could set off a series of further reactions, barriers to the operation of Ethiopia's official foreign exchange market must be removed through additional deregulation.

By applying the monetary approach to parallel foreign currency markets, DH Bui (2014) carried out empirical research to investigate the factors impacting Vietnam's parallel market exchange

rate. The parallel market rate can be somewhat viewed as a stand-in for a freely floating exchange rate because Vietnam is subject to a fixed exchange rate regime.

The official exchange rate and the money supply (net domestic assets) were determined to be the main predictors of the parallel market exchange rate; nonetheless, these factors had the greatest impact between 2000 and 2007. Exchange rates significantly declined in both the official and parallel markets during this period as a result of the State Bank of Vietnam's large increase in money supply to spur economic growth.

One cannot escape the reality of corruption in many countries, particularly in emerging nations. Studies conducted recently have looked into the economic effects of corruption in addition to its social ones. In the process, academics have examined how corruption affects a variety of macro factors, including the real exchange rate, government budget, productivity, growth rate, investment, and inflation. We examine how corruption affects the black-market premium in this essay. In theory, corruption may lead to a rise in both the supply and demand of foreign exchange on the illicit market. It may therefore have a favorable or unfavorable effect on the black-market premium. The premium rises if corruption leads to an excess of demand for foreign currencies on the illicit market. Otherwise, it could decrease it. Bahmani-Oskooee and Goswami (2005) took a simple model from the literature and changed it to include a measure of corruption as an extra component determining the premium. The model was estimated using cross-sectional data for each year between 1982 and 1995 from 60 developing countries. In half of the cases, they found evidence that higher degrees of corruption correspond to larger premiums on the illicit market. When we switched to a panel analysis and estimated the model by pooling data from 60 nations throughout the 1982–1995 period, they discovered further evidence supporting our theory.

Exchange rate volatility is significantly higher (42% on average) in countries with higher levels of government corruption, according to research by Josefa Ramoni-Perazzi and Hector Romero (2022) but gradually decreases over time, likely as a result of the implementation of more regulated exchange rate policies, at least in times of higher volatility. Furthermore, the two groups' real per capita GDP levels differ significantly from one another; in the 2010s, the low corruption group had an average GDP per capita of \$28,800, which was eight times higher than the GDP per capita of \$3,271, with faster development and greater homogeneity. Furthermore,

the data demonstrates that there are notable variations in the two groups' financial development. As a result, between 2000 and 2010, the coefficient of corruption in low-corruption nations climbed from 0.35 to 0.50 and even decreased in dispersion, While in nations with significant levels of corruption, it hardly climbed from 0.16 to 0.19. The key finding of the study, however, is that economies with lower levels of public corruption are more susceptible to the detrimental impacts of changes in exchange rates on economic growth. The unexpected result calls for looking into possible reasons, and its confirmation presents a fascinating topic for more research.

The long-term outcome of the regression analysis showed that the primary factors influencing the PEM are the availability of foreign exchange, money supply, export taxes, official exchange rate depreciation, and tightening of exchange controls. The model excludes illegal commerce, import tax, and total foreign exchange reserve at the NBE because of incorrect signs. The results of the error correction estimation showed that the primary factors are export tax, foreign exchange availability, one period lag in the money supply and official exchange rate depreciation. Illegal trade, import taxes, and the NBE reserve do not have statistically significant effects in the short term, in line with the long-run hypothesis. The percentage of adjustment to the long-run equilibrium route is 58%, indicating a comparatively rapid rate of adjustment. Additionally, the model passed every test in the specification, including the coefficient stability test (Lemma, 2004).

Yeheyis (1998) conducted a study on the economic factors influencing the parallel currency premium in 12 African countries. The findings indicated that the real GDP amount was negligibly tiny. It was mentioned that financial events have an impact. Monetary expansion, a change in the depreciation-adjusted interest-rate differential, and a quicker rate of inflation at home compared to abroad were all associated with a rise in the premium. The degree of export constriction and the current forecast of devaluation showed the expected symptoms, notwithstanding the poor estimation of the parameters. Inertia had a large role in the premium's determination connected with the official devaluation rate, which responded considerably to it initially but less so over time.

The foreign exchange premium's dynamic trajectory, driven by capital flight triggered by economic sanctions, leads the informal market exchange rate to exceed its equilibrium level. The extent of this overshooting is influenced by the central bank's foreign exchange reserves. As

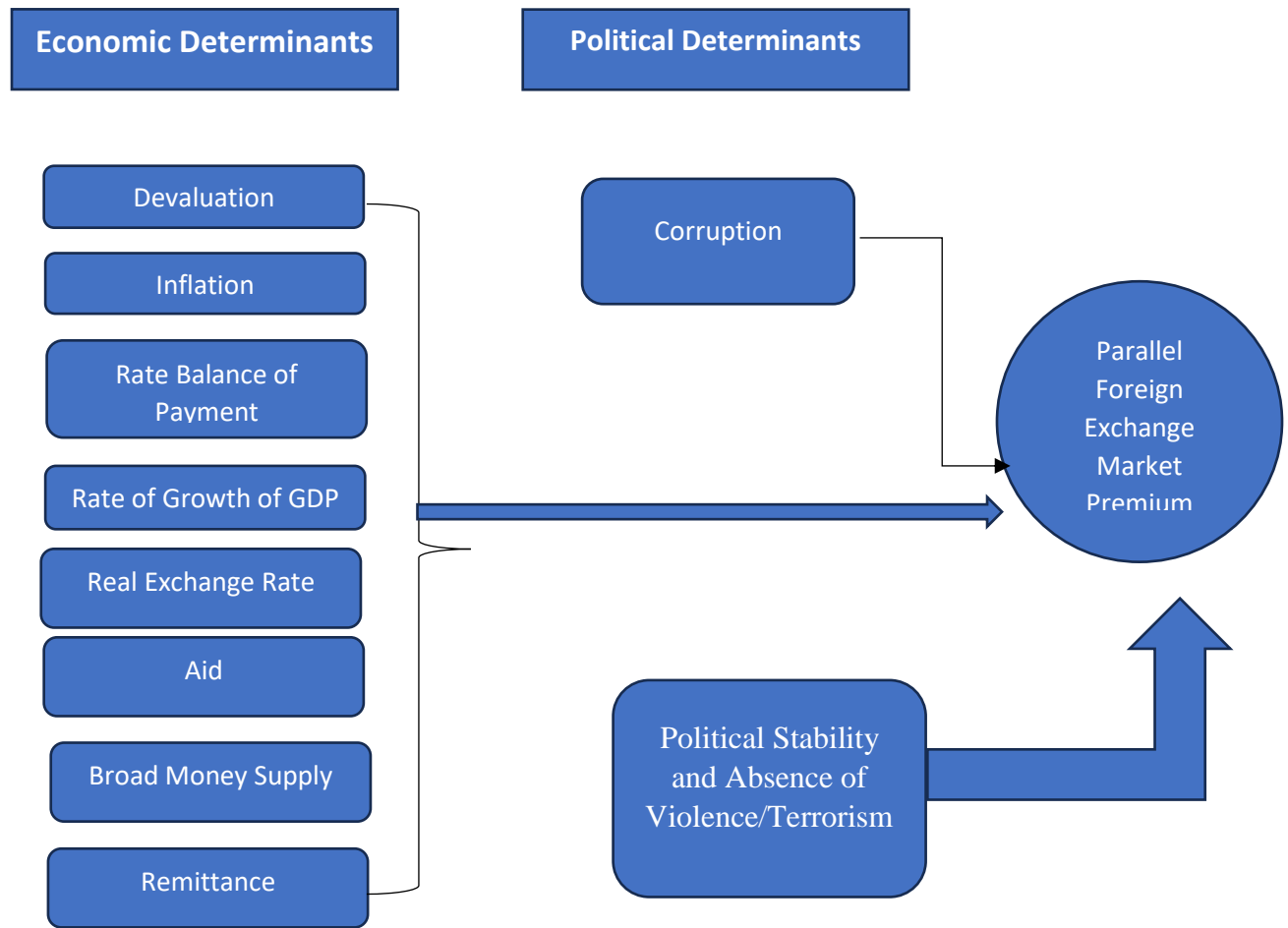
these reserves dwindle, speculative attacks on the informal exchange rate push the premium higher. The study concludes that lasting currency rate unification is unattainable amid political instability and economic sanctions that induce substantial capital flight. However, a flexible exchange rate policy can mitigate the impact of sanctions on capital flight by maintaining a fixed informal foreign exchange premium and managing domestic money demand through higher interest rates on government bonds. This helps to curb private agents' demand for domestic currency (Onour and Sergi, 2020).

Building on the work of Benedict et al. (2022) who investigated the impact of political risk on foreign exchange demand in Zimbabwe, this study explores the relationship between these factors. Their findings suggest a significant negative short-run correlation, implying that an increase in political risk leads to a decrease in a country's foreign exchange reserves. In the case of Zimbabwe, a one-unit rise in political risk was associated with a 2.79% decline in foreign reserves in the short term. This can be interpreted as a rise in demand for foreign currency as political and economic instability increases. Individuals and investors, seeking to protect their assets from potential shocks, may choose to hold more stable foreign currencies.

## **2.4 Conceptual Framework**

Parallel foreign exchange markets, often known as black markets, emerge when the official exchange rate set by the central bank doesn't align with the actual market demand and supply for foreign currency. This discrepancy creates a context where various factors influence the premium, or the difference between the official and parallel market rates. This breakdown outlines the conceptual framework for understanding these determinants.

Figure 1 Conceptual Framework



## **Chapter Three:**

### **Model Specification, Methodology, and Data**

#### **3.1 Model Specification**

##### **The Portfolio Balanced Model**

Scholars and professionals have extensively studied the determination and forecasting of exchange rates using various models and ideas. The reason for this is because exchange rates are essential to every economy, particularly those that include international trade and global market competitiveness. Exchange rate fluctuations produce uncertainty, which makes forecasting profits and making decisions challenging. Consequently, the uncertainty surrounding exchange rates influences both financing and investment decisions. However, a stable exchange rate instills confidence in investors and allows for the effective use of financial resources. Thus, investments are transferred to capital markets, where they can be used to take advantage of business possibilities and stimulate economic expansion (Damankeshideh and Shanasaei, 2013).

A variety of theories have been used to determine and forecast exchange rates, the most prominent ones being purchasing power parity, the balance of payments approach (BOP), the monetary approach, and the approach of portfolio balance. Before monetary policies were implemented in 1970, trade flows were believed to be the main drivers affecting currency rates. Because the BOP approach reflects the impact of the current account, it was crucial. However, markets for financial assets have grown in significance as a result of liberalization, and models that use asset techniques are now more successful in understanding the factors that influence exchange rates. These methods include of portfolio and monetary methods. The monetary approach makes the assumption that monetary forces affect the supply and demand for money and establish the exchange rate at equilibrium (Khan and Abbas 2015).

This model presents an asset pricing perspective on the exchange rate; its fundamental theory is that there is a portfolio option for both local and foreign assets, and that the arbitrage from expected returns offered by the portfolio's constituent assets is what drives the exchange rate process (Dornbusch, 1988). It clarifies that the demand and supply of a variety of financial assets

control the exchange rate, at least in the short term, and that it is not a fixed process. The material reviewed in the preceding section leads us to the conclusion that a wide range of economic factors impact the establishment of the foreign exchange black market. Although the PEMP has been analyzed using a variety of models, this study has mostly employed the portfolio balance model developed by Kiguel and O'Connell (1994) and Aron, Janine, Ogun (2015) & Elbadawi, Ibrahim (1992), albeit with some adjustments.

This approach has been adopted due to its applicability, particularly in the context of the chosen nations, and the availability of trustworthy data. That is, the key drivers of the black market exchange rate have been identified as inflation and currency rate depreciation, two factors that have a significant impact on portfolio composition (Aron, Janine & Elbadawi, Ibrahim. (1992)).

The Model: The dynamics of PEMP are both short- and long-term. The PMP model, which was adapted from Ogun (2015), may be expressed generally as

$$Parallel\ Premium = \alpha_{it} + \delta_i Fundamentals + \gamma_i Determinants + \varepsilon_i \dots\dots\dots (1)$$

where  $\varepsilon$  is the random error and  $\alpha$ ,  $\delta$ , and  $\gamma$  are parameters associated with the  $i$ th variable. Three variables stem from the economy's structure. First, the GDP, is an excellent indicator of productivity growth or technical advancement, which ought to happen more quickly in the tradeable goods industry. A strong GDP can be associated with a more stable currency and lower demand for foreign exchange in the parallel market. However, the relationship can be complex. The second factor is balance of payments, which should have a negative impact on parallel market premiums since, over time, export prices should rise faster than import prices. A current account deficit (more imports than exports) can create a demand for foreign currency to pay for imports. The third is foreign reserves, which should positively influence Parallel market premiums.

$$Structure\ of\ an\ Economy = GDP + BOP + Foreign\ Reserves \dots\dots\dots (2)$$

There are at least three channels through which foreign reserves could influence the parallel market premium. One is through its influence on monetary and fiscal policies. Interest Rates: Higher domestic interest rates can attract foreign investment, increasing the supply of foreign currency. (This can be complex; high interest rates might also encourage capital flight, negating

the effect). Two, through an expectation or prosperity demand for the domestic currency (devaluation), people might buy foreign currency in the parallel market anticipating a profit if the official exchange rate is expected to devalue further. And third, by influencing legislation to support more liberalized international aid, remittances, and personal and business travel allowances. Remittances: The amount of foreign currency available on the black market may rise as a result of financial inflows from residents employed overseas. Foreign aid inflows can also increase the supply of foreign currency. The other fundamental rise here is the Money supply.

$$\text{PMP} = \text{Foreign reserves (Interest rates + Devaluation + Remittances + Aid) + GDP + BOP ... (3)}$$

The other determinants include expected inflation: high inflation erodes the purchasing power of domestic currency, increasing demand for foreign currency as a store of value, and real exchange rate, An undervalued real exchange rate (domestic currency appears cheap) can incentivize foreign investment and tourism, increasing the supply of foreign currency. , real interest rate: Higher domestic interest rates can attract foreign investment, increasing the supply of foreign currency. (This can be complex; high-interest rates might also encourage capital flight, negating the effect), corrupt practices: high corruption can lead to capital flight, where businesses and individuals move money out of the country, increasing demand for foreign currency. and Political Stability can create uncertainty and discourage investment, leading to increased demand for foreign currency as a haven.

Here we added political stability and the absence of violence in the model. Because political stability and the absence of violence are plausible factors influencing the existence and activity of a parallel foreign exchange market. When governments restrict access to foreign currency through capital controls, it creates a black market for those needing forex outside official channels. Political instability and violence often lead to capital controls to manage capital flight (outflow of money). Political instability and violence breed uncertainty about the future and distrust in institutions. This can cause people to lose faith in the official exchange rate, leading them to seek foreign currency in a parallel market to preserve the value of their savings (IMF, 2022). When violence and instability disrupt economic activity, the demand for foreign currency as a haven can rise. This can lead to a wider gap between the black market's official and parallel exchange rates. A less stable political environment with violence can make it harder for governments to enforce capital controls and crack down on parallel market activity.

The black market can now function more freely as a result. Ashwini and Roland (2003) provided data linking the black-market premium to political and economic instability. As would be predicted given that a large premium denotes an overvalued official currency rate, they observed that a high premium is suggestive of significant economic and financial instability in a nation. On the other hand, based on the official real exchange rate of Ghana, Adjei, Yu, and Nketiah (2019) discovered a positive correlation between economic performance and political stability. Therefore, our work used their outcome as a model and adopted it.

$$\text{PMP} = (\text{Interest rates} + \text{Devaluation} + \text{Remittances} + \text{Aid}) + \text{GDP} + \text{BOP} + \text{Inflation} + \text{Real exchange rates} + \text{Corruption} + \text{political stability} \dots \dots \dots \quad (4)$$

Following the discussion, the parallel market premium's estimable linear econometric equation is written as follows:

$$\text{Parallel Premium}_{it} = \beta_0 + \beta_1 \text{Political Stability}_{it} + \beta_2 \text{Corruption}_{it} + \beta_3 \text{Devaluation}_{it} + \beta_4 \text{Balance of Payment}_{it} + \beta_5 \text{Broad Money Supply}_{it} + \beta_6 \text{GDP}_{it} + \beta_7 \text{Aid}_{it} + \beta_8 \text{Inflation}_{it} + \beta_9 \text{Real Exchange Rate}_{it} + \beta_{10} \text{Official Interest Rate}_{it} + \varepsilon_{it} \dots \quad (5)$$

According to the model, a number of factors, including political stability and the absence of violence, the expected rate of devaluation, the growth rate of the balance of payments (BOP), the growth rate of the broad money supply, the growth rate of the GDP, the growth rate of official development assistance/aid, inflation, the real official exchange rate, and the official interest rate, all contribute to the explanation of the parallel market premium.

In light of both theoretical and actual data, the signs of corruption could be positive or negative. Since the actual exchange rate's decline lowers the parallel market premium, the real official exchange rate's coefficient must be negative. Given that the exchange rate premium rises with a rise in the rate of currency devaluation, a positive sign of predicted devaluation is anticipated. Since monetary expansion raises inflation, which in turn causes a large parallel premium of foreign exchange, the impact of money supply would also be favorable. The expectation is that the coefficient of aid will be negative because foreign assistance reduces the parallel premium and expands the availability of foreign money.

### **3.2 Data Sources**

In order to fulfill the specified goals, the research employed secondary data. These data are collected from IMF (Broad Money Supply, Interest Rates, Official Exchange rates, Balance of Payments), WB (Parallel Foreign Exchange rate, Inflation, Remittances, Official Development Assistance), International Transparency Organization (Corruption Index and Political Instability and Violence indices) UNCTAD, and UNCOMTRADE trade statistics, from the different publications of IMF, WB, UN, and OECD, from the official websites of the National/Central/Reserve Banks of the sample countries, and other international institutions. As a result, based on the variable of interest for the sample countries, the data has been compiled from these sources.

### **3.3 Method of Data Analysis**

A stationary panel data analysis was used to examine the acquired data in order to meet the study's objectives. A panel cointegration technique was adopted in the study once the stationarity tests were verified. In order to account for simultaneity bias and potential endogeneity of the explanatory variables, the long run and short run relations are estimated using Random Effect panel data analysis. This process involves determining whether a co-integrating relationship exists among the variables. Following the use of estimation tests such as the endogeneity test, heteroscedasticity test, cointegration test, and autocorrelation tests.

Table 3.1 Variables Expected sign

No	Variable	Justification	Expected Sign
1	Political Stability and Absence of Violence	Political instability can create uncertainty and increase the demand for foreign currency in the parallel market.	Negative
2	Corruption	Corruption is expected to increase the parallel exchange rate premium. Higher levels of corruption encourage individuals to use the parallel market to circumvent regulations.	Positive
3	Balance of Payment	A positive balance of payments signifies a surplus of foreign currency, potentially reducing demand in the parallel market.	Negative
4	Gross Domestic Product	The impact of GDP on the parallel exchange rate premium can be ambiguous. A higher GDP might suggest a stronger economy and reduced demand for foreign currency in the parallel market (negative coefficient). However, it could also indicate increased import demand, putting pressure on the official exchange rate and driving some transactions to the parallel market (positive coefficient).	Positive/Negative
5	Remittance Inflow	This variable can have a positive or negative impact depending on the context. Remittances can increase foreign currency supply, potentially lowering the premium. However, if access to the official market is restricted, remittances might flow through the parallel market, raising the premium.	Positive/Negative
6	Foreign Aid	Similar to remittances, the impact of foreign aid can be ambiguous. Increased aid can boost foreign	Positive/Negative

		currency reserves, potentially lowering the premium. However, if not managed effectively, it could also fuel inflation and increase demand for foreign currency in the parallel market.	
7	Inflation	Higher inflation diminishes the purchasing power of domestic currency, leading to increased demand for foreign currency as a store of value, potentially driving demand to the parallel market	Positive
8	Official Interest Rate	The impact of interest rates can be complex. Higher domestic interest rates might attract foreign investment, increasing foreign currency supply and lowering the premium. However, the relative interest rate differential between domestic and foreign rates can also influence the attractiveness of the parallel market.	Positive/Negative
9	Real Exchange Rate	This variable captures the purchasing power of the domestic currency relative to foreign currencies. A depreciating real exchange rate (positive coefficient) can make foreign currency more attractive, potentially increasing demand in the parallel market	Negative

## **Chapter Four:**

### **Results and Discussion**

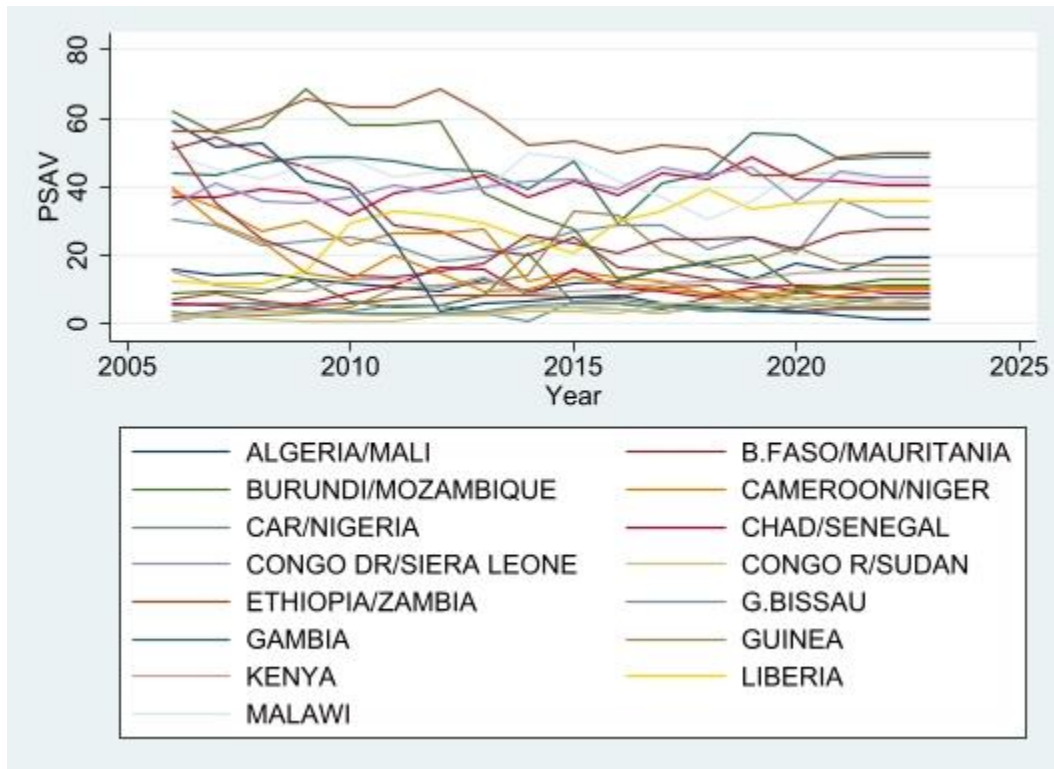
This chapter examines political and economic factors influencing parallel foreign exchange markets in selected African nations using annual balanced panel data covering all variables for each cross-section and time period. The research includes a time series analysis from 2006 to 2023 and a cross-sectional analysis of 24 African nations. After presenting the organized data, significant correlation and regression results were reviewed. Descriptive statistics were selected, and fixed versus random effect model tests were chosen. This analysis helps identify the most suitable model for the data, considering diagnostic tests, traditional linear regression, and correlation analysis between variables. The key section, following the fixed effect panel data regression model results, provides a detailed explanation of the findings based on the empirical literature reviewed for the study

#### **4.1 Descriptive Statistics**

##### **4.1.1 Trends of Parallel foreign Exchange market premium**

Over the past few decades, there have been significant changes to the foreign currency markets of Sub-Saharan African (SSA) Low- and Lower-Middle-Income Countries (LLMICs). Many countries have liberalized their forex markets and capital accounts, moving to more flexible exchange rates. Furthermore, several nations have switched to monetary regimes that prioritize containing inflation and make the interest rate the primary tool for policy. The dynamics of exchange rates and the composition of forex markets may be significantly impacted by these developments. There is a large variance in the PEMP in the sub-Saharan African countries. It ranges from 114 to -100. The average PEMP in the selected African countries is 3%.

**Figure 2 Trends of PEMP**

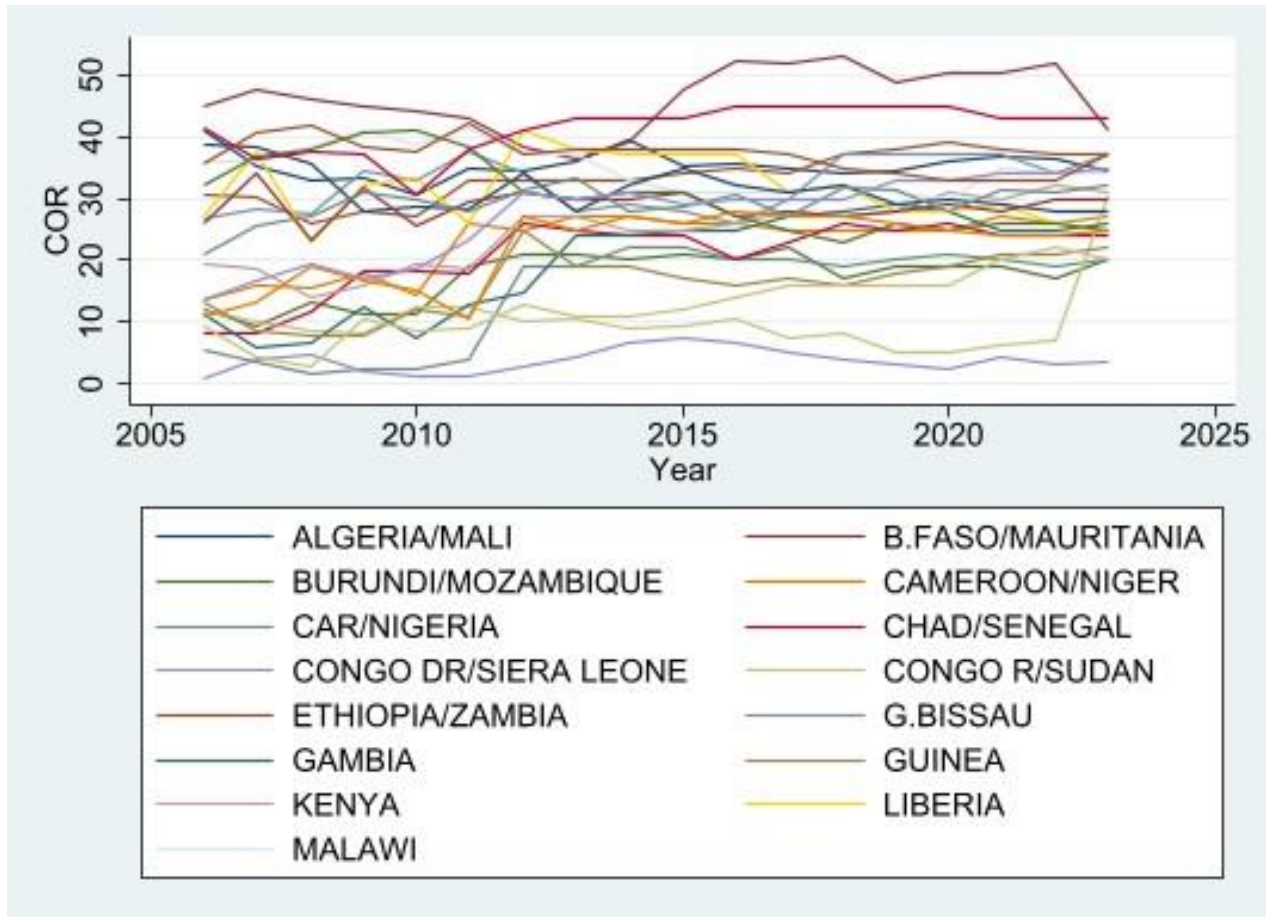


Source: compiled from the raw data (2024)

#### 4.1.1 Trends of Corruption

Many sub-Saharan African nations are making significant strides toward the Agenda 2063 of the African Union, which outlines a vision of a democratic, affluent, and peaceful continent. Gains, though, are jeopardized by rampant corruption. In addition to the widespread issue of petty bribery in certain areas of the region, alarming types of corruption, such as state takeover, have been brought about by the interconnected problems of fragility, crony capitalism, and weak governance. As a result, several nations have passed anti-corruption legislation. The media, civil society, and regional organizations are all actively addressing the issue. (Jorum Duri, 2020). The graph below shows that the situation of corruption in the selected African countries. The graph shows that the highest is around 55 and the lowest 1. In general, we can see that the corruption level is high in Africa it is below the average.

Figure 3 Trends of Corruption

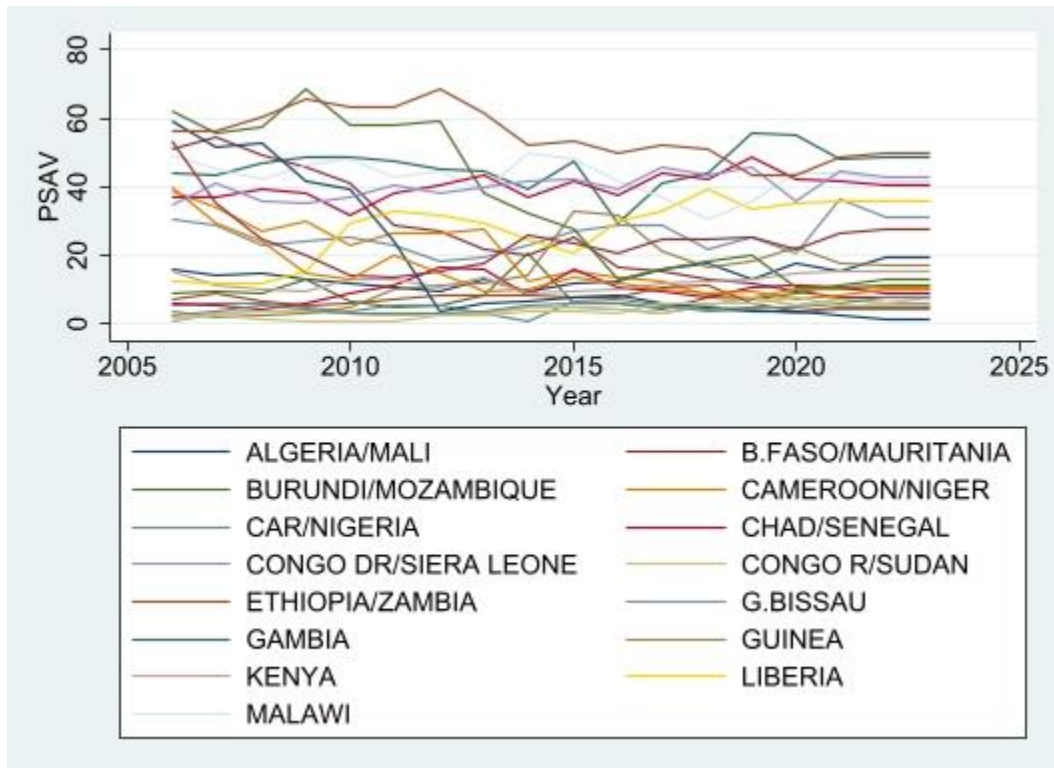


Source: compiled from the raw data (2024)

#### 4.1.2 Trends of Political Stability and Absence of Violence

The PSAV index measures the perceived likelihood of political instability and violence, including terrorism. A score of 100 indicates a clean political environment. Africa continues to lag behind other regions based on this metric. The political stability score is poor, on average 20. When we see individual score, the minimum is 0.47 and the maximum is 67.72.

Figure 4 Trends of Political Stability



Source: compiled from the raw data (2024)

Before presenting the econometric analysis, this section provides a summary of the variables' behavior and individual country unit categories. The descriptive analysis is based on the statistical summary of the data used for regression analysis. The table below highlights the mean, standard deviation, minimum, maximum values, and number of observations for each variable under study.

**Table 4. 1 Descriptive Statistics**

	(1)	(2)	(3)	(4)	(5)
<b>Variables</b>	<b>Observation</b>	<b>Mean</b>	<b>Std. dev.</b>	<b>Min</b>	<b>Max</b>
Parallel Premium	432	3.065908	14.154	-100	114
Political Stability	432	20.94874	17.18932	0.476191	68.72038
Corruption	432	26.02483	11.227	1.421801	52.85714
Devaluation	432	7.701844	33.24475	-19.3356	586.6999
Balance of payment	432	-5.1965	275.1301	-1803.04	2730.959
Broad money supply	432	18.0884	20.42073	-27.4644	282.505
GDP	432	11.65176	60.81552	-75.0739	1229.038
AID	432	13.16806	65.4097	-84.4327	924.0289
Inflation	432	9.907209	23.49483	-8.97474	359.093
Real exchange rate	432	1006.215	2348.496	2.0161	21288.7
Remittance	432	62.38966	466.3896	-100	7081.529
Number countries	24	24	24	24	24

Source: compiled from the raw data using STATA (2024)

We can see from Table 4.1 that the PERP is measured by the difference between the official market exchange rate and the parallel market exchange rate, which ranges from -100 to 114%. The minimum amount (-100) was registered in Zambia in 2012 and the maximum amount of 114 was registered in Ethiopia in 2023. The average corruption score is 26.02, with a standard deviation of 11.23. This suggests a fair amount of variability in corruption levels across the countries in the sample. The minimum corruption score is 1.42, and the maximum is 52.86.

The corruption perception index (CPI) ranks countries based on their perceived levels of public sector corruption, as assessed by experts and surveys. The CPI defines corruption broadly as "the abuse of entrusted power for private gain". Transparency International, a non-governmental organization, has been publishing the index every year since 1995. It is ranked from 100 (extremely clean) to 0 (very corrupt): the minimum value is 1.42 which was registered in Congo DR in the year 2011 and the maximum is 52.85 in Burkina Faso in 2018 with the standard deviation value of 11.227. Perceptions of the possibility of political instability and/or politically motivated violence, such as terrorism, are measured by PSAV. The minimum value of 0.47 which shows very low political stability in the Central African Republic in 2014 and the maximum was registered in 2009 in Mozambique with a high political stability 68.72. on this variable, the mean value is 20.94 and the standard deviation is 17.18 (on average low political stability). One can note that both corruption and political instability data in the selected countries don't have a good rank in the global standard.

A positive value of devaluation indicates domestic currency weakens, and a negative value indicates appreciation (domestic currency strengthens). The mean value of 7.70 on average, indicates that there was a slight devaluation across the countries. Standard deviation 33.24 shows that there is a very high variation in devaluation rates across countries, with some experiencing significant devaluation and others appreciating.

Devaluation ranges from the minimum of -19.335 (significant appreciation of the currency) to the maximum of 586.699 (significant devaluation of the currency). The minimum value of devaluation was registered in Zambia in 2006 while the maximum in Sudan in 2001. Balance of Payment represents the net difference between a country's exports and imports of goods, services, and capital flows over a specific period. A positive value indicates a balance of payments surplus, and a negative value indicates a deficit. Most of the African countries have a negative balance of payment. Nigeria encountered in the year 2006 a -1803 % (large balance of payments deficits) balance of payment which is the least and Algeria has a large balance of payment surplus recorded the largest in the year 2011 (2730%). The average country has a balance of payments deficit of -5.20. The average real exchange rate is 1006.21, with a standard deviation of 2348.49. This suggests that there is a large range of real exchange rates across the

countries in the sample. The minimum real exchange rate is 2.02, and the maximum real exchange rate is 21288.70.

The data shows Congo Republic had a -27.46 % decrease in their Broad money supply while Sudan in 2022 had a significantly higher growth rate in the broad money supply. GDP measures the total market value of all goods and services produced within a country in a year, essentially indicating the size of its economy. GDP growth represents the percentage change in GDP from one period to another. A positive value indicates economic growth, while a negative value indicates a contraction. Mean value 11.65% shows on average, the countries experienced moderate economic growth. With the Std. Dev 60.82% we can conclude that there is a very high variation in growth rates across countries, with some experiencing significant growth and others experiencing large declines. Sudan in 2017 experienced a severe economic decline -(75.07%) whereas Guinea Bissau experienced an extreme economic boom, 157% growth.

Looking at Aid and Remittances, Aid has the minimum values of -84% and 924% as the maximum point in the data. Whereas remittances have a lower value of -100 and a higher value of 7081. On average a 13.16% Aid increment and a 62.34% in remittance are registered. Generally, PERP seems to have a relatively wide range of values, from -100 to 114. Balance of Payment and Remittance have very large standard deviations compared to their means, suggesting a lot of variation in the data. Gross Domestic Product and Real Exchange rate have very large positive maximum values.

## **4.2 Diagnostic Tests**

### **4.2.1 Unit Root Test**

Here, we look at our series' unit root state to determine their integration order. Unrealistic regression findings may arise from the inclusion of nonstationary variables in econometric model estimate (Asteriou, Dimitrios, and Hall, 2007). As a result, unit-root tests have been used to assess the stationarity of the variables in the model in order to verify if they are stationary (Levin et al., 2002). For data that are highly balanced, individual predictable trends, and diverse serially correlated mistakes, this test is advised. Instead of doing separate unit root tests for each cross-section, it is more effective to run a panel unit root test for the entire panel.

The theory goes that against alternative theories with exceptionally persistent departures from equilibrium, single panel unit root tests are poor. Panels under the alternative hypothesis are steady, whereas those under the null hypothesis have unit roots (Baltagi, 2001). Since the tests are appropriate for both balanced and unbalanced panels and permit heteroskedasticity and cross-sectional dependence (correlation between residuals of different individuals), we employed the Im-Pesaran-Shin (IPS) and Levin-Lin-Chu Tests. It creates a single test statistic by combining the individual ADF (Augmented Dickey-Fuller) unit-root tests for every panel.

Table 4. 2 **Unit Root Tests**

H0: All panels contain unit roots		Number of panels = 24					
Ha: Some panels are stationary		Number of periods = 18					
AR parameter: Panel-specific		Asymptotic: T, N -> Infinity sequentially					
Variables	Im-Pesaran-Shin (IPS)					Levin-Lin-Chu	
	Statistic	P-Value	Fixed-N exact critical Values			Statistic (adjusted t)	P-Value
			1%	5%	10%		
Parallel Premium	-32.4843	0.0000***	-1.950	-1.820	-1.750	67.8052	1.0000
Political Stability	-2.3338	0.0001***	-1.950	-1.820	-1.750	-4.0477	0.0000***
Corruption	-2.1933	0.0042**	-1.950	-1.820	-1.750	-3.6669	0.0001***
Devaluation	-3.7239	0.0000***	-1.950	-1.820	-1.750	-9.0787	0.0000***
Balance of Payment	-4.0861	0.0000***	-1.950	-1.820	-1.750	-7.0911	0.0000***
Broad Money Supply	-3.5088	0.0000***	-1.950	-1.820	-1.750	-5.3835	0.0000***
GDP	-3.3620	0.0000***	-1.950	-1.820	-1.750	-7.0442	0.0000***
AID	-6.7807	0.0000***	-1.950	-1.820	-1.750	-5.6786	0.0000***
Inflation	-2.6182	0.0000***	-1.950	-1.820	-1.750	-2.3540	0.0093***
Remittance	14.6150	0.0000***	-1.950	-1.820	-1.750	-7.3854	0.0000***
Real Exchange Rate	2.8834	0.0428**	-1.950	-1.820	-1.750	2.8834	0.9980
Interest Rate	-10.1891	0.0000***	-1.950	-1.820	-1.750	-6.5294	0.0000***

Note: adjusted t value in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1, \*\*\*Statistical significance at 1%, \*\*Statistical significance at 5%, \* Statistical significance at 10%.

Source: compiled from the raw data using STATA (2024)

Based on Im-Pesaran-Shin (IPS) unit root test results, variables parallel premium, corruption, political stability devaluation, balance of payment, broad money supply, GDP, Aid, Inflation, remittance, and Interest rate are stationary at the level at 1% level of significance whereas Real exchange rate is stationary at the level at 5% level of significance. Whereas according to Levin-Lin-Chu (LLC) unit root test result all variables except (Parallel Premium and Real Exchange Rate) are stationary at 1% level of significance.

#### **4.2.2 Cointegration Tests**

If the variables are integrated in the same order, it is essential to determine whether an equilibrium relationship exists among them. Co-integration describes the existence of an equilibrium or stationarity relationship between two or more Variables. For this study co-integration examines the relationship between the PEMP and its determinants. It is very important to assess whether relationships exist between parallel market premiums and the chosen determinants, for a viable economic conclusion to be reached from the results obtained. In a panel data setup, there are three types of cointegration tests namely Kao, Pedroni, and Westerlund. The paper used all the available tests.

**Table 4. 3 Tests for Cointegration**

H0: No cointegration	Number of panels	24
Ha: All panels are cointegrated	Number of periods	16
<b>Statistic</b>		
<b>p-value</b>		
<b>Kao</b>		
Modified Dickey-Fuller test	-8.7274	0.0000
Dickey-Fuller test	-7.7187	0.0000
Augmented Dickey-Fuller test	-5.6641	0.0000
Unadjusted Dickey-Fuller test	-13.5251	0.0000
Unadjusted modified Dickey-Fuller test	-8.9401	0.0000
<b>Pedroni</b>		
Modified Phillips–Perron test	4.3418	0.0000
Phillips–Perron test	-8.6775	0.0000
Augmented Dickey-Fuller t	-2.6540	0.0040
Modified Phillips–Perron test	3.8643	0.0001
Phillips–Perron test	-6.8345	0.0000
Augmented Dickey-Fuller t	-6.9952	0.0040
<b>Westerlund</b>		
Variance Ration	6.7414	0.0000
Variance Ration	-3.6445	0.0001

Source: compiled from the raw data using STATA (2024)

We can infer that there is a very strong evidence that the variables are cointegrated from the aforementioned cointegration tests. This means that a stable long-run equilibrium relationship exists between the variables. In other words, even though the individual variables may be trending and non-stationary, a linear combination of them is stationary.

### 4.2.3 Test for Multicollinearity

The table below shows the variance inflation factors (VIFs) for a regression model. VIFs are used to diagnose multicollinearity, which is the state in which there is a strong correlation between the independent variables in a regression model. From the table below we can conclude multicollinearity is not an issue in the model, all VIFs are less than 10.

Table 4. 4 Multicollinearity test

Variable	VIF	1/VIF
Political Stability	1.59	0.629268
Corruption	1.42	0.702986
Inflation	1.71	0.583368
Broad Money Supply	1.59	0.628705
Interest Rate	1.27	0.787766
Devaluation	1.18	0.84807
Real Exchange Rate	1.04	0.959162
GDP	1.03	0.9752
Remittance	1.02	0.98239
AID	1.01	0.989254
Balance of Payment	1.01	0.989543
Mean VIF	1.26	

Source: compiled from the raw data using STATA (2024)

### 4.2.4 Breusch-Pagan Lagrangian Multiplier Test

The significance of random effects in panel data models is evaluated using the Breusch-Pagan Lagrangian Multiplier test. Assuming a zero variance for the random effects ( $u$ ), the null hypothesis ( $H_0$ ) is put forth. Stated differently, the model does not contain any random effects.

Table 4. 5 Breusch-Pagan LM Test

Estimated Result		
	Var	SD = sqrt(var)
Parallel Premium	200.3356	14.154
e	129.6894	11.38812
u	25.90581	5.089775
Test: Var(u) = 0		
	chibar2(01)	108.57
	Prob > chibar2	0.0000

Source: compiled from the raw data using STATA (2024)

We reject the null hypothesis because the p-value (0.0000) is smaller than the typical significance level of 0.05. This suggests that random effects are probably significant in our model as the variance of random effects (u) is statistically different from zero. The Breusch-Pagan LM test suggests that there are significant unobserved factors specific to each country (captured by u[country]) that influence the parallel premium. Ignoring these random effects by using a pooled OLS model might not be ideal. A random effects model would likely be more appropriate for the data. The chi-square statistic (108.57) further strengthens the rejection of the null hypothesis, indicating a strong influence of random effects.

#### 4.2.5 Hausman Specification Test

The random effect model is selected, as indicated by the table based on the results of the Hausman (1978) specification test, where the p-value is more than a 5% level of significance showing failure to reject the null hypothesis. Thus, the random effect model is estimated in this work.

Table 4. 6Test for Fixed effect vs Random Effect Model

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b V_B))
	fe	re	Difference	std.err
Political stability	-0.3027052	-0.2683873	-0.0343179	0.0378578
Corruption	0.0836284	0.1783508	-0.0947224	0.0836952
Devaluation	0.0075445	0.006106	0.0014385	0.0028176
Balance of payment	-0.002971	-0.002794	-0.000177	0.0002229
Broad Money Supply	-0.0208169	-0.0165799	-0.0042369	0.0051579
GDP	0.0665227	0.0689857	-0.002463	0.0011862
AID	-0.0075919	-0.0081876	0.0005958	0.0009164
Inflation	0.0168049	0.0084536	0.0083512	0.0072268
Remittance	-0.000658	-0.0007125	0.0000545	0.0001714
Real Exchange Rate	0.0002432	0.0003071	-0.000064	0.0003094
Interest Rate	0.0876179	0.3197046	-0.2320867	0.1566765
<p>b = Consistent under H0 and Ha; obtained from xtreg.</p> <p>B = Inconsistent under Ha, efficient under H0; obtained from xtreg.</p> <p>Test of H0: Difference in coefficients not systematic</p> <p><math>chi2(11) = (b-B)'[(V_b-V_B)^{-1}](b-B)</math></p> <p>= 16.48</p> <p>Prob &gt; chi2 = 0.1242</p>				

Source: compiled from the raw data using STATA (2024)

#### 4.2.6 Test for homoscedasticity

Gujarati (2004) states that homoscedasticity, which holds that the variance of the residuals for each explanatory variable (i.e., the conditional variance of  $u_i$ ) stays a constant positive value, is one of the tenets of the classical linear regression model (CLRM). Thus, in order to determine the heteroscedasticity problems in this work, the Breusch Pagan test was employed. This test indicates that if the p-value is significant at a 95 percent confidence interval, the data have a heteroscedasticity problem; otherwise, it does not (greater than 0.05). This study has a heteroscedasticity problem, as the appendix states. As a result, the (p-value) is less than 0.05, which is significant, and it was used to address the heteroscedasticity issue. robustness of heteroscedasticity standard error.

*Table 4. 7 Test for Homoscedasticity*

$H_0 = \sigma^2(i) = \sigma^2$ for all $i$		Result
1	LR $\chi^2(23)$	961.13
2	Prob > $\chi^2$	0.0000

Source: compiled from the raw data using STATA (2024)

A p-value of 0.000 in a homoscedasticity test indicates very strong evidence that the null hypothesis of homoscedasticity (equal variances) is violated. In other words, the test suggests there is heteroscedasticity, meaning the variances of the errors are unequal across different levels of the independent variables.

#### 4.2.7 Test for Autocorrelation

A test for the detection of autocorrelation was done. The result shows that there is an autocorrelation issue in the data. Therefore, because of the presence of heteroscedasticity and autocorrelation issues, a cluster robust estimation method was applied.

Table 4. 8 Test for Autocorrelation

No.	Wooldridge test for autocorrelation in panel data	
	H <sub>0</sub> = no first-order autocorrelation	
1	F (1, 23)	7.7778
2	Prob > F	0.0104

Source: compiled from the raw data using STATA (2024)

A p-value of 0.0104 in the autocorrelation test suggests statistically significant autocorrelation at the 5% significance level. This means that the errors in the regression model are likely correlated with lagged versions of themselves. Therefore, we reject the null hypothesis.

#### 4.2.8 Test for Endogeneity

When an explanatory variable in an econometric model shows a correlation with the residuals, often known as the "error term" or "disturbance term," it is said to be endogenous (Lu et al., 2018). Experts in econometrics and editors of esteemed academic journals agree that endogeneity is one of the "blind spots" that might lead to academic publications being rejected at various levels of review (Guide & Ketokivi, 2015).

A statistical test used in econometrics to determine whether an independent variable in a regression model has endogeneity is called the Wald test of exogeneity. According to the Wald test's null hypothesis, the independent variable is exogenous. Stated otherwise, there is no correlation between it and the regression's error term. Given that the p-values exceed a commonly used significance level (e.g., 0.05), there is insufficient data to draw the conclusion that endogeneity occurs in the model. Stated differently, a fundamental premise of linear regression analysis is that the explanatory variables in the regression have no correlation with the error term, according to the Wald test. The Wald test statistic (1473.50) with a highly significant p-value of 0 shows that the explanatory variables in the model are jointly significant. In other words, together, the independent variables in the model have a statistically non-zero impact on the dependent variable.

The tests are attached in the appendix.

The social sciences have extensively employed multiple alternative methodologies (Instrumental Variable, GMM, 2SLS) to handle a variety of endogeneity difficulties (Lu et al., 2018). However, the IV-based estimate method is still commonly used for cross-sectional and panel datasets because to its strict underlying assumptions regarding endogeneity and requirements for identifying appropriate instrumental variables (IVs). One popular method for estimating IVs is the 2SLS methodology. The model's endogeneity problems have been tested using the Durbin and Wu-Hausman tests. Immediately following the IV regression's implementation (ivregress), the STATA command "estat endogenous" was used to look for potential endogeneity problems. The outcome implies that endogeneity in the model is not a problem.

**Table 4.7 Durbin and Wu-Hausman tests of endogeneity**

Tests of endogeneity

H0: Variables are exogenous

Durbin (score) chi2(3)	.235009	(p = 0.8891)
Wu-Hausman F(3,420)	.114575	(p = 0.8918)

Source: compiled from the raw data using STATA (2024)

The Durbin and Wu-Hausman tests' null hypothesis is that the variables under investigation may be exogenous. Since neither test statistic is significant in this case, we accept the null of exogeneity and must keep treating the variables as exogenous.

#### **4.2.9 Granger Causality Test**

The Granger causality test is a statistical hypothesis test used to determine whether one time series is useful in forecasting another. In simpler terms, it helps us understand if past values of one variable can help predict future values of another variable. Detailed Causality test attached in the appendix.

**Table 4.8 Granger Causality Test**

<b>Juodis, Karavias and Sarafidis (2021) Granger non-causality Test</b>			
	Number of units= 24	Obs. per unit (T) = 17	BIC = 903.4482
H0: Selected covariates do not Granger-cause Parallel Premium.			
H1: H0 is violated.			
	HPJ Wald test : 1.7e+03		
	p-value : 0.0000		

Source: compiled from the raw data using STATA (2024)

### 4.3 Regression Result Analysis

This section presents the empirical results of a random effects regression analysis conducted to explore the determinants of parallel foreign currency markets. The analysis focuses on a range of economic and political factors. The factors influencing the parallel foreign exchange rate were identified through the application of the random effect model with cluster estimation approach.

**Table 4.9 Regression Analysis**

<b>Variable</b>	<b>Coefficient</b>	<b>Robust Std. err</b>	<b>P&gt; t</b>
Political Stability	-0.2683873	0.0822564	0.001
Corruption	0.1783508	0.122	0.144
Devaluation	0.006106	0.0124302	0.623
Balance of Payment	-0.002794	0.0020828	0.180
Broad Money Supply	-0.0165799	0.0281309	0.556
GDP	0.0689857	0.0059241	0.000
AID	-0.0081876	0.0025691	0.001
Inflation	0.0084536	0.0150253	0.574
Remittance	-0.0007125	0.0002699	0.008
Real Exchange Rate	0.0003071	0.0001632	0.060
Interest Rate	0.3197046	0.1707419	0.061

Source: compiled from the raw data using STATA (2024)

PSAV are statistically significant and have a negative connection. The PSAV coefficient is substantial and negative (p-value = 0.001). This implies a negative association, meaning that, when all other variables are held constant, an increase of one unit in PSAV is linked to an average reduction of 26.84 units in the dependent variable. Put differently, a lower PEMP value is linked to higher political stability. The outcome attained here is in harmony with the literary works.

As presented in the above table, corruption (it is indexed with 1-100, and 100 means most clear) has a positive relationship (it is in favor of Mohsen Bahmani-Oskooee and Goswami (2005) result) with the dependent variable but statistically not significant. It is theoretically claimed that corruption might lead to a rise in both the supply and demand of foreign exchange on the illicit market. It may therefore have a favorable or unfavorable effect on the black-market premium. The premium rises if corruption leads to an excess of demand for foreign currencies on the illicit market. If not, it might make it less. The result obtained from this paper concerning corruption is in line with the literature and the result found by Bahmani-Oskooee and Goswami (2005), Dornbusch (1986), and Kiguel, Lizondo, O'Connell (1997).

According to theory, the projected rate of devaluation is negligible and has a positive sign. The outcome lends credence to the theory that agents might have been using local currency as hedging against devaluations by replacing assets denominated in foreign currencies. The study's findings are in line with those of Caporale and Cerrato (2006) and Nikrunziza (2002). Although it is statistically negligible, the predicted depreciation has a favorable effect on parallel market premiums, according to the empirical examination of the outcome. The regression analysis results show a negative relationship between parallel market premium and balance of payment with a slightly insignificant p-value (0.180). The result found here is similar to the results found by Degeffa (2001), this is in line with the theory that a strong BOP indicates a surplus, meaning more foreign currency is flowing into a country than flowing out. This could be due to high exports, low imports, or foreign investments. When there's a healthy supply of foreign currency, the government has less need for strict exchange controls. This can lead to Reduced demand for foreign currency in the parallel market, lowering the premium, and Increasing confidence in the official exchange rate, discouraging people from using the parallel market.

The regression's conclusion indicates a substantial indirect relationship between a rise in the broad money supply and a larger parallel market premium. Broad money supply represents the total amount of money circulating in an economy, including cash, checking accounts, and other easily convertible assets. When there's more money chasing the same amount of goods and services, it tends to drive up prices (inflation). High inflation can erode confidence in the domestic currency. People may seek to exchange their domestic currency for foreign currency to preserve its value. Governments sometimes impose restrictions on buying foreign currency through official channels. This creates a demand for foreign currency in the parallel market, driving up the exchange rate and the premium. The obtained result is similar to Ebaidalla's (2019) findings.

The relationship between GDP and the parallel market exchange rate is complex and depends on the specific circumstances. A higher GDP can sometimes lead to an overvalued official exchange rate. This means the official rate doesn't reflect the true value of the currency. Businesses and individuals who need foreign currency may then turn to the parallel market, driving the exchange rate there higher. A strong and growing economy (reflected in high GDP) can also lead to increased demand for foreign currency for imports of machinery and materials needed for further growth. This can put pressure on the parallel market exchange rate, causing it to appreciate (strengthen) relative to the local currency. The coefficient of GDP is positive (unlike the literature) and it has a significant p-value. GDP has a positive and highly significant coefficient (p-value = 0.000) with a relatively small standard error. This suggests a strong positive relationship between GDP and the Parallel market Premium. In other words, a one-unit increase in GDP is associated with an average increase of 6.9 units in the dependent variable, while controlling for other factors. This paper's findings concerning GDP are similar Akinbobola et al (2018). They found in Nigeria that parallel market premium has a direct and significant effect on macroeconomic variables (GDP, Inflation, and Interest Rate). Farzanegan (2008) discovered a positive correlation between the black market premium and GDP, drawing the conclusion that a positive GDP sign indicates rising per capita income, which in turn drives up demand for both legal and illegal imports on the domestic market but does not always translate into higher investments in Iran's institutional improvements and increased transparency. Similar findings were made by Oladele (2015) and Matallah and Bounoua (2015), who concluded that there was a positive correlation between the parallel exchange rates and Nigeria's GDP growth. In a similar

vein, Bernet and Ho (1999) concluded that increased participation in the black market leads to both higher average growth and higher inflation in the economy. A positive relationship between GDP and PEMP suggests that as a country's GDP increases, so does the premium on the parallel market exchange rate. This phenomenon is often observed in developing economies, including Ethiopia. Some of the justifications include: Economic Instability and Uncertainty: A higher PEMP often signals economic instability and uncertainty. As GDP grows, if not managed effectively, it can lead to inflationary pressures, currency devaluation, and a widening gap between the official and parallel exchange rates. Reduced Foreign Direct Investment (FDI): A higher PEMP can deter foreign investors, as it increases the perceived risk associated with investing in the country. This can hinder economic growth and development. Inefficient Resource Allocation: A distorted exchange rate can lead to inefficient allocation of resources. Businesses may prioritize short-term gains over long-term investments, hindering sustainable economic growth. Increased Cost of Living: A higher PEMP can increase the cost of imported goods, leading to inflation and a decline in the purchasing power of the local currency.

The PEMP and foreign aid (AID) have a complicated and ambiguous relationship. However, that will rely on how the nation uses it. Injecting foreign currency directly into the official market through AID has the potential to augment the overall foreign exchange supply. This may contribute to closing the difference between the parallel and official rates. Effective AID initiatives can decrease fundamental imbalances that lead to premium prices and accelerate economic growth. This can entail promoting exports or the building of infrastructure. The data points to a negative correlation between foreign aid and the parallel market premium, based on the results obtained. It demonstrates how foreign exchange supply on the official market can be increased by foreign aid infusions. This can reduce the need for businesses and individuals to resort to the black market for foreign exchange, lowering the premium. Large aid inflows can signal confidence in the economy, potentially leading to a depreciation of the official exchange rate (bringing it closer to the black-market rate) and reducing the premium. The result shows the negative relationship of Aid with the black-market premium with the highly significant p-value. A unit increase in foreign aid leads to a 0.81% reduction in the parallel market premium. The result is similar to Degeffa (2001) and Ebaidalla (2017). Aid inflows can increase the supply of

foreign currency in the domestic market. This increased supply can reduce the demand for foreign currency on the parallel market, leading to a lower premium.

There isn't quite a symmetrical relationship between inflation and the parallel market premium. Nonetheless, there is a close relationship between the two, with inflation frequently fueling a larger premium in the parallel market. A high rate of inflation weakens public trust in the national currency. People turn to the black market, where the exchange rate reflects their lack of faith, in search of foreign cash as a store of value. The premium rises as a result of the increased demand for foreign cash on the black market. Inflation frequently results from the official exchange rate overvaluing the home currency. Purchasing foreign money on the black market, where the exchange rate is more in line with its actual market worth, is encouraged by this. There are two ways in which inflation impacts the foreign exchange parallel market. First, it leads to a growing overvaluation of the fixed nominal exchange rate, which in turn expands the size of the parallel market. Second, inflation causes capital flight by lowering real domestic interest rates. Accordingly, inflation could lead to an increase in the parallel exchange rate (Degefa, 2001). Reverse causality occurs when two variables influence each other bidirectionally. In the context of inflation and PEMP, it's possible that: Inflation positively affects PEMP: Higher inflation could lead to increased nominal profits for businesses, especially those with pricing power. Higher PEMP positively affects inflation: Increased profits could lead to higher wages and investment, which might contribute to inflationary pressures. However, Panel data RE (Random Effects) models can help address reverse causality by: Controlling for Unobserved Heterogeneity: Panel data models account for individual-specific effects which are countries in our cases, that are constant over time.

This helps to isolate the impact of inflation on PEMP, reducing the influence of other factors that might be correlated with both variables.

Yacoub et al. (2022) claim that the history of inflation in countries with parallel currency markets is bleak. Between 1970 and 2001, the average rate of inflation in countries with parallel markets was six times higher than that of countries with unified rates. With an insignificant p-value, the result demonstrates a positive link between parallel foreign exchange markets and inflation. An increase of one unit in inflation causes the parallel foreign exchange market to rise

by 0.8%. This finding is consistent with the notion put forward by Pierre-Richard Agenor (1992), Yacoub (2022), Makochekanwa (2007), Degefa (2001), Ogun (2015), and Magun (2015).

Remittances, typically money sent back home by migrant workers, act as a source of foreign currency for the recipient country. More foreign currency enters the official market, potentially reducing the scarcity that pushes people towards the parallel market, because Remittances are a source of foreign currency entering a country with easier access to foreign currency through official channels, the demand for the riskier parallel market falls. Similar to the findings of Agenor (1992) and Akinbobola et al (2018) the paper found a negative relationship between remittances and Parallel market premiums. According to the regression result, a unit increase in the remittances inflow increases the PEMP by 0.07% keeping other things constant. Remittance has a negative sign and is statistically significant in explaining parallel exchange rate premiums. An increase of remittance by 1% decreases PERP by 0.30% with a significant p-value of fewer than 10% significance level. The result shows a negative relationship between Remittance and PERP. Remittances directly increase the supply of foreign exchange in the economy. This increased supply can alleviate foreign exchange shortages and reduce the demand for foreign currency on the parallel market. As a result, the premium on the parallel market decreases.

The real exchange rate and the parallel market premium are typically inversely correlated. This indicates that a smaller parallel market premium is typically the result of a stronger real exchange rate, or an increasing value of the home currency. The possibility of artificial fixing or control over the official currency rate gives rise to the parallel market. This may result in a situation where the official exchange rate is not indicative of the currency's actual market value. People are more inclined to use the black market to obtain foreign currency when there is a strong real exchange rate, which indicates that domestic currency is overvalued. The premium rises as a result of the parallel market's increased demand. Though it's less frequent, there are some situations in which a positive relationship may be seen. People may rush to purchase foreign money on the black market if there is anticipation of an official devaluation, or a decline in the value of the home currency. This would increase the premium even before the real exchange rate declines. Compared to the real exchange rate, the premium on the parallel market can fluctuate more. Even in cases where there hasn't been much of a shift in the underlying real exchange rate, there may be a brief increase in the premium due to abrupt shocks or imbalances.

At the 6% significance level, the real exchange rate coefficient is positive and statistically significant. This suggests that the premium on the parallel market is encouraged by a declining actual exchange rate. This outcome supports Onour's (1997) study, which discovered that real currency depreciation significantly raises the premium in Sudan.

It's crucial to comprehend the subtleties of the well acknowledged positive correlation between interest rates and the parallel market premium. Keeping local money may be more appealing with rising interest rates. The possibility of greater foreign exchange profits, however, may become more alluring if there is a sizable discrepancy between the official exchange rate and the parallel market rate (also known as the parallel market premium). It may be more advantageous for investors looking for greater returns to exchange their local currency for foreign currency and transfer it to markets offering better interest rates. The premium may rise as a result of the parallel market's increased demand for foreign money. The parallel market premium in Zambia was found to be positively correlated with the interest rate differential by Aron and Elbadawi (1992). This study discovered a favorable correlation between interest rates and PEMP's. Given the P-value of 0.061, we can conclude that the parallel market premium will typically rise by 31.98% for every unit increase in the interest rate. A notable study by Bahmani-Oskooee & Goswami, 2005 entitled *Determinants of the Parallel Market Premium: Evidence from Developing Countries*, found a positive relationship between interest rates and the parallel market premium in a sample of developing countries.

## **Chapter Five:**

### **Conclusions and Recommendations**

#### **5.1 Conclusion**

One of the primary goals of this research is to factor out some empirical evidence regarding the factors that influence the parallel foreign exchange market. A fundamental understanding of the factors that influence the PEM is essential for developing and implementing policies and strategies. The parallel market may become even more powerful if certain macroeconomic policy variables such as taxation, fiscal and exchange rate policies, and exchange rate restrictions are changed. Consequently, this leads to an ineffective distribution and utilization of the limited resources. A World Bank study involving several nations revealed that having a high premium for an extended length of time harmed growth and resource allocation with no clear market benefit.

The result obtained from the regression analysis revealed that Political stability and absence of Violence, Gross Domestic Product, Aid, and Remittances are the main determinants of PEMP. Therefore we can conclude that political and macroeconomic policy variables play a significant role in explaining changes in parallel exchange rate premiums in Africa.

- The research found a positive and statistically significant relationship between GDP and PEMP. This suggests that as an economy grows, the parallel market premium tends to increase as well. However, further investigation is needed to understand the underlying causes of this relationship.
- The analysis revealed a negative and significant relationship between political stability and the absence of violence and Parallel Exchange Market Premium. Countries with greater political stability tend to have lower parallel market premiums, highlighting the importance of a stable environment for a healthy foreign exchange market. Political instability and violence create uncertainty and risk for businesses and investors. A stable political environment fosters confidence and reduces risk. This can lead to a decrease in the demand for foreign currency on the parallel market, lowering the premium. One of the most common complaints from industrialists and businessmen is political uncertainty.

The primary factor influencing economic stability is definitely the unstable political system. According to the paper's findings, the parallel foreign exchange premium is severely deteriorated by political stability and the absence of violence. As a result, African nations had to put forth effort to guarantee a politically stable and violent-free continent.

- Similarly, Official Development Assistance/Aid showed a negative and significant relationship with Parallel Exchange Market Premium. This suggests that foreign aid might contribute to reducing the premium, potentially by supporting economic development and fostering stability.
- Remittances were also negatively associated with Parallel Market Exchange Rate Premium. This could indicate that remittances help alleviate pressure on the official exchange rate, reducing the need to resort to the parallel market.
- These findings suggest that promoting economic growth, while crucial, needs to be accompanied by measures that enhance political stability and manage the foreign exchange market. Official development assistance can play a role in supporting these efforts. Further research is recommended to explore the causal mechanisms at play and identify the most effective policies to address the parallel market premium and promote a stable economic environment.

## **5.2 Policy Implications**

The paper attempted to single out the main determinants of the PEMin Africa. The result of the analysis showed that Political Stability, Gross Domestic Product, Aid, and Remittance are statistically significant. Therefore, based on the findings of the study, the following policy implications have been drawn

- In order to reduce the difference between the official and parallel exchange rates, effective policies must be implemented. The majority of the time, it is best to gradually unify the official and alternative exchange markets. Appropriate trade liberalization policies that improve export performance must also go hand in hand with this. In order to do this, exports must be aggressively promoted and diversified, boosting remittances from abroad and expanding non-traditional exports like tourist services. Policymakers

must give macroeconomic policies, like the money supply and real exchange rates, a great deal of consideration given their substantial influence in lowering premiums.

- Countries aiming to attract foreign investment and reduce parallel market exchange rate premiums can focus on strengthening political stability and reducing violence. Investors considering foreign markets should factor in political stability as a key risk factor. Countries with higher political stability and absence of violence scores might offer lower foreign exchange market premiums, potentially leading to better returns on investments. Cooray et al. (2017) investigated how trade openness and the labor force participation rate in Africa are impacted by political institutions, democracy, political rights, and civil liberties. According to their findings, the most effective political structures increase the involvement rate within the workforce. This promotes a nation's economic progress. To put it another way, political stability can affect economic growth, including attracting both domestic and foreign investment. All of this contributes to a rise in overall demand and accelerates the economic expansion of a nation.
- The finding that GDP has a positive and significant relationship with the PEMP is interesting and somewhat counterintuitive. Policymakers should focus on economic growth but with caution. Since higher GDP is associated with a higher parallel exchange market premium, policymakers might be tempted to prioritize policies that stimulate economic growth at all costs. However, ensuring this growth is sustainable and promotes long-term stability is crucial. Policies that address the underlying causes of the parallel exchange market premium, such as capital controls or lack of confidence in the official exchange rate, might be more effective. A positive relationship between GDP and PEMP suggests that as a country's GDP increases, so does the premium on the parallel market exchange rate. This phenomenon is often observed in developing economies, including Ethiopia. To mitigate the negative impacts of a higher PEMP, the African governments specially Ethiopian government should:
  - **Implement Sound Economic Policies:** This includes maintaining macroeconomic stability, controlling inflation, and promoting sustainable economic growth.
  - **Improve Governance and Reduce Corruption:** Good governance and transparency can attract foreign investment and reduce the risk of capital flight.

Diversify the Economy: Reducing reliance on a few primary commodities can help to stabilize the economy and reduce the impact of external shocks.

Liberalize the Foreign Exchange Market: Gradually liberalizing the foreign exchange market can help to reduce the gap between the official and parallel exchange rates.

By addressing these issues, Governments like Ethiopia can reduce the negative impact of a higher PEMP and promote sustainable economic growth.

- To maximize the impact of Aid on the PEMP, recipient countries can improve transparency and accountability in aid management. This helps ensure that aid resources are used effectively and efficiently to address the root causes of the parallel market premium. Central Banks should also strongly monitor the utilization of the Aid.
- Policymakers should develop policies that encourage and facilitate remittance inflows and explore ways to encourage and facilitate the flow of remittances into the country through legal channels.

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## Appendix

### Appendix

#### Cointegration Tests

```
. xtointtest kao ParallelPremium Corruption PpoliticalStability Devaluation BalanceOfPayment Mone  
> ySS GDP AID Inflation RealExchangeRate Remittance
```

Kao test for cointegration

H0: No cointegration	Number of panels	=	24
Ha: All panels are cointegrated	Number of periods	=	16

Cointegrating vector:	Same	Kernel:	Bartlett
Panel means:	Included	Lags:	1.29 (Newey-West)
Time trend:	Not included	Augmented lags:	1
AR parameter:	Same		

---

	Statistic	p-value
Modified Dickey-Fuller t	-8.6161	0.0000
Dickey-Fuller t	-7.6352	0.0000
Augmented Dickey-Fuller t	-5.6821	0.0000
Unadjusted modified Dickey-Fuller t	-13.4367	0.0000
Unadjusted Dickey-Fuller t	-8.8739	0.0000

---

Tests for Cointegration (Pedroni)

```
. xtointtest pedroni ParallelPremium Corruption PpoliticalStability Devaluation BalanceOfPayment
> MoneySS GDP AID
```

Pedroni test for cointegration

H0: No cointegration	Number of panels	=	24
Ha: All panels are cointegrated	Number of periods	=	17
Cointegrating vector: Panel specific			
Panel means:	Included	Kernel:	Bartlett
Time trend:	Not included	Lags:	1.00 (Newey-West)
AR parameter:	Panel specific	Augmented lags:	1
	Statistic		p-value
Modified Phillips-Perron t	6.9800		0.0000
Phillips-Perron t	-5.2229		0.0000
Augmented Dickey-Fuller t	-2.6842		0.0036

```
. xtointtest pedroni ParallelPremium Inflation RealExchangeRate Remittance
```

Pedroni test for cointegration

H0: No cointegration	Number of panels	=	24
Ha: All panels are cointegrated	Number of periods	=	17
Cointegrating vector: Panel specific			
Panel means:	Included	Kernel:	Bartlett
Time trend:	Not included	Lags:	2.00 (Newey-West)
AR parameter:	Panel specific	Augmented lags:	1
	Statistic		p-value
Modified Phillips-Perron t	0.9259		0.1772
Phillips-Perron t	-37.8869		0.0000
Augmented Dickey-Fuller t	-5.3568		0.0000

Source: own Computation (2024)

## Test for Cointegration (Westerlund)

```
. xtointtest westerlund ParallelPremium Corruption PpoliticalStability Devaluation BalanceOfPayme  
> nt MoneySS GDP AID
```

### Westerlund test for cointegration

---

H0: No cointegration                      Number of panels        =     24  
Ha: Some panels are cointegrated        Number of periods       =     18

Cointegrating vector: Panel specific  
Panel means:            Included  
Time trend:             Not included  
AR parameter:           Panel specific

---

	Statistic	p-value
Variance ratio	11.1435	0.0000

---

```
. xtointtest westerlund ParallelPremium Inflation RealExchangeRate Remittance
```

### Westerlund test for cointegration

---

H0: No cointegration                      Number of panels        =     24  
Ha: Some panels are cointegrated        Number of periods       =     18

Cointegrating vector: Panel specific  
Panel means:            Included  
Time trend:             Not included  
AR parameter:           Panel specific

---

	Statistic	p-value
Variance ratio	-1.2489	0.1059

---

Source: Own computation (2024)

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

ParallelPremium[country1,t] = Xb + u[country1] + e[country1,t]

Estimated results:

	Var	SD = sqrt(Var)
ParallelPremium	200.3356	14.154
e	129.6894	11.38812
u	25.90581	5.089775

Test: Var(u) = 0

chibar2(01) = 108.57  
Prob > chibar2 = 0.0000

## Fixed Effect Model vs. Random Effect Model

```
. xtreg ParallelPremium Corruption PolitalStability Devaluation BalanceOfPayment BroadMoneySupply
> GDP AID Inflation Remittance RealExchangeRate InterestRate, fe
```

```
Fixed-effects (within) regression      Number of obs   =      432
Group variable: country1              Number of groups =       24
```

```
R-squared:                            Obs per group:
  Within = 0.1589                      min =          18
  Between = 0.1870                     avg =         18.0
  Overall = 0.1645                      max =          18
```

```
corr(u_i, Xb) = -0.0919                F(11,397)      =       6.82
                                          Prob > F       =      0.0000
```

ParallelPremium	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Corruption	.0836284	.1206969	0.69	0.489	-.1536567	.3209134
PolitalStability	-.3027052	.0659659	-4.59	0.000	-.4323915	-.173019
Devaluation	.0075445	.0185038	0.41	0.684	-.0288331	.0439222
BalanceOfPayment	-.002971	.0020505	-1.45	0.148	-.0070022	.0010603
BroadMoneySupply	-.0208169	.0350419	-0.59	0.553	-.0897077	.0480739
GDP	.0665227	.0093945	7.08	0.000	.0480535	.0849919
AID	-.0075919	.0085987	-0.88	0.378	-.0244965	.0093127
Inflation	.0168049	.0328768	0.51	0.610	-.0478295	.0814393
Remittance	-.000658	.0012186	-0.54	0.590	-.0030537	.0017378
RealExchangeRate	.0002432	.000476	0.51	0.610	-.0006927	.001179
InterestRate	.0876179	.1977543	0.44	0.658	-.3011587	.4763944
_cons	5.464115	4.475468	1.22	0.223	-3.334464	14.26269
sigma_u	7.092979					
sigma_e	11.388124					
rho	.27950238	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(23, 397) = 5.20                Prob > F = 0.0000
```

```
. estimates store fe
```

```
. xtreg ParallelPremium Corruption PolitalStability Devaluation BalanceOfPayment BroadMoneySupply
> GDP AID Inflation Remittance RealExchangeRate InterestRate, re
```

```
Random-effects GLS regression           Number of obs   =       432
Group variable: country1               Number of groups =        24
```

```
R-squared:                               Obs per group:
  Within = 0.1546                          min =         18
  Between = 0.3987                         avg =        18.0
  Overall = 0.2188                          max =         18
```

```
corr(u_i, X) = 0 (assumed)                Wald chi2(11)   =       87.26
                                           Prob > chi2     =       0.0000
```

ParallelPremium	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Corruption	.1783508	.0880951	2.02	0.043	.0056875	.351014
PolitalStability	-.2683873	.0545656	-4.92	0.000	-.3753339	-.1614407
Devaluation	.006106	.0184147	0.33	0.740	-.0299862	.0421983
BalanceOfPayment	-.002794	.0020523	-1.36	0.173	-.0068165	.0012285
BroadMoneySupply	-.0165799	.0349	-0.48	0.635	-.0849826	.0518227
GDP	.0689857	.0093834	7.35	0.000	.0505945	.0873769
AID	-.0081876	.0086082	-0.95	0.342	-.0250594	.0086842
Inflation	.0084536	.0323008	0.26	0.794	-.0548547	.071762
Remittance	-.0007125	.0012148	-0.59	0.558	-.0030935	.0016685
RealExchangeRate	.0003071	.000366	0.84	0.401	-.0004102	.0010244
InterestRate	.3197046	.1228433	2.60	0.009	.0789362	.560473
_cons	-.4975191	3.012875	-0.17	0.869	-6.402646	5.407608
sigma_u	5.0897749					
sigma_e	11.388124					
rho	.16649492	(fraction of variance due to u_i)				

```
. estimates store re
```

```
. hausman fe re, sigmamore
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) Std. err.
	(b) fe	(B) re		
Corruption	.0836284	.1783508	-.0947224	.0836952
PolitalStability	-.3027052	-.2683873	-.0343179	.0378578
Devaluation	.0075445	.006106	.0014385	.0028176
BalanceOfPayment	-.002971	-.002794	-.000177	.0002229
BroadMoneySupply	-.0208169	-.0165799	-.0042369	.0051579
GDP	.0665227	.0689857	-.002463	.0011862
AID	-.0075919	-.0081876	.0005958	.0009164
Inflation	.0168049	.0084536	.0083512	.0072268
Remittance	-.000658	-.0007125	.0000545	.0001714
RealExchangeRate	.0002432	.0003071	-.000064	.0003094
InterestRate	.0876179	.3197046	-.2320867	.1566765

b = Consistent under H0 and Ha; obtained from xtreg.  
 B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

```
chi2(11) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          = 16.48
Prob > chi2 = 0.1242
```

.

```
. xtserial ParallelPremium Corruption PolitalStability Devaluation BalanceOfPayment BroadMoneySup
> ply GDP AID Inflation Remittance RealExchangeRate InterestRate
```

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

```
F( 1, 23) = 7.778
Prob > F = 0.0104
```

Date: 06/22/24 Time: 00:29

Sample: 2006 2023

Included observations: 450

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.45...	0.45...	95.21...	1.70...
		2 0.34...	0.16...	148.5...	5.64...
		3 0.13...	-0.0...	157.0...	7.79...
		4 0.02...	-0.0...	157.3...	5.42...
		5 -0.0...	0.01...	157.3...	3.63...
		6 -0.0...	0.02...	157.3...	2.15...
		7 0.01...	0.01...	157.4...	1.12...
		8 0.08...	0.08...	160.5...	1.24...
		9 0.03...	-0.0...	161.0...	4.49...
		10 0.03...	-0.0...	161.6...	1.48...
		11 0.13...	0.16...	170.1...	1.11...
		12 0.06...	-0.0...	171.8...	1.95...

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.458	0.458	95.215	0.000
		2 0.343	0.168	148.51	0.000
		3 0.137	-0.092	157.09	0.000
		4 0.024	-0.076	157.34	0.000
		5 -0.002	0.019	157.35	0.000
		6 -0.003	0.028	157.35	0.000
		7 0.012	0.015	157.41	0.000
		8 0.082	0.086	160.53	0.000
		9 0.034	-0.047	161.05	0.000
		10 0.036	-0.011	161.64	0.000
		11 0.135	0.167	170.13	0.000
		12 0.062	-0.045	171.90	0.000

### Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals

Equation: Untitled

Periods included: 18

Cross-sections included: 25

Total panel observations: 450

Cross-section effects were removed during estimation

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	1005.550	300	0.0000
Pesaran scaled LM	28.80395		0.0000
Bias-corrected scaled LM	28.06865		0.0000
Pesaran CD	8.310587		0.0000

Panel Period Heteroskedasticity LR Test  
Equation: UNTITLED  
Specification: PARALLELPREMIUM C CORRUPTION POLITICALSTABILIT  
Y BALANCEOFPAYMENT BMONEYSUPLY DEVALUATION GDP  
INFLATION INTERESTRATE REALEXCHANGERATE REMITTANCE  
AID

Null hypothesis: Residuals are homoskedastic

	Value	df	Probability
Likelihood ratio	1790.192	25	0.0000

LR test summary:

	Value	df
Restricted LogL	-2734.520	438
Unrestricted LogL	-1839.423	438

Unrestricted Test Equation:

Dependent Variable: PARALLELPREMIUM

Method: Panel EGLS (Period weights)

Date: 06/22/24 Time: 00:58

Sample: 2006 2023

Periods included: 18

Cross-sections included: 25

Total panel (balanced) observations: 450

Iterate weights to convergence

Convergence achieved after 6 weight iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.309328	1.224967	-3.517915	0.0005
CORRUPTION	0.211763	0.049928	4.241394	0.0000
POLITICALSTABILITY	-0.151921	0.031869	-4.767039	0.0000
BALANCEOFPAYMENT	-0.002723	0.001393	-1.953969	0.0513
BMONEYSUPLY	0.123143	0.006243	19.72432	0.0000
DEVALUATION	-0.125567	0.001420	-88.40496	0.0000
GDP	0.054934	0.016793	3.271242	0.0012
INFLATION	-0.033962	0.013729	-2.473690	0.0138
INTERESTRATE	0.325364	0.021485	15.14351	0.0000
REALEXCHANGERATE	8.51E-05	8.17E-07	104.1597	0.0000
REMITTANCE	-0.000469	0.000805	-0.582187	0.5607
AID	-0.003217	0.007471	-0.430565	0.6670

Weighted Statistics

Root MSE	106.2485	R-squared	0.975182
Mean dependent var	93.51180	Adjusted R-squared	0.974558
S.D. dependent var	674.6614	S.E. of regression	107.6942
Akaike info criterion	8.228549	Sum squared resid	5079937.
Schwarz criterion	8.338129	Log likelihood	-1839.423
Hannan-Quinn criter.	8.271738	F-statistic	1564.569
Durbin-Watson stat	1.039839	Prob(F-statistic)	0.000000

Unweighted Statistics

R-squared	0.254518	Mean dependent var	15.24825
Sum squared resid	5079937.	Durbin-Watson stat	2.100934

```
. xtreg ParallelPremium Corruption PolitalStability Devaluation BalanceOfPayment BroadMoneySupply
> GDP AID Inflation Remittance RealExchangeRate InterestRate, re robust
```

```
Random-effects GLS regression           Number of obs   =       432
Group variable: country1               Number of groups =        24
```

```
R-squared:                               Obs per group:
  Within = 0.1546                          min =         18
  Between = 0.3987                          avg =        18.0
  Overall = 0.2188                          max =         18
```

```
corr(u_i, X) = 0 (assumed)                Wald chi2(11)   =    1473.50
                                           Prob > chi2    =     0.0000
```

(Std. err. adjusted for 24 clusters in country1)

ParallelPremium	Robust				
	Coefficient	std. err.	z	P> z	[95% conf. interval]
Corruption	.1783508	.122	1.46	0.144	-.0607649 .4174664
PolitalStability	-.2683873	.0822564	-3.26	0.001	-.4296069 -.1071677
Devaluation	.006106	.0124302	0.49	0.623	-.0182566 .0304687
BalanceOfPayment	-.002794	.0020828	-1.34	0.180	-.0068762 .0012883
BroadMoneySupply	-.0165799	.0281309	-0.59	0.556	-.0717155 .0385556
GDP	.0689857	.0059241	11.64	0.000	.0573746 .0805968
AID	-.0081876	.0025691	-3.19	0.001	-.013223 -.0031523
Inflation	.0084536	.0150253	0.56	0.574	-.0209953 .0379026
Remittance	-.0007125	.0002699	-2.64	0.008	-.0012415 -.0001835
RealExchangeRate	.0003071	.0001632	1.88	0.060	-.0000128 .000627
InterestRate	.3197046	.1707419	1.87	0.061	-.0149434 .6543526
_cons	-.4975191	2.752403	-0.18	0.857	-5.892131 4.897092
sigma_u	5.0897749				
sigma_e	11.388124				
rho	.16649492	(fraction of variance due to u_i)			

Dependent Variable: PARALLELPREMIUM

Method: Panel EGLS (Cross-section random effects)

Date: 06/23/24 Time: 10:37

Sample: 2006 2023

Periods included: 18

Cross-sections included: 24

Total panel (balanced) observations: 432

Swamy and Arora estimator of component variances

White cross-section (period cluster) standard errors & covariance (d.f. corrected)

Standard error and t-statistic probabilities adjusted for clustering

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.497519	1.771852	-0.280791	0.7823
CORRUPTION	0.178351	0.058024	3.073717	0.0069
POLITALSTABILITY	-0.268387	0.135098	-1.986611	0.0633
DEVALUATION	0.006106	0.016526	0.369477	0.7163
BALANCEOFPAYMENT	-0.002794	0.002139	-1.306024	0.2089
BROADMONEYSUPPLY	-0.016580	0.024211	-0.684802	0.5027
GDP	0.068986	0.007261	9.500441	0.0000
AID	-0.008188	0.002855	-2.867353	0.0107
INFLATION	0.008454	0.012822	0.659308	0.5185
REMITTANCE	-0.000712	0.000364	-1.955889	0.0671
REALEXCHANGERATE	0.000307	0.000233	1.317383	0.2052
INTERESTRATE	0.319705	0.100142	3.192511	0.0053

Effects Specification

	S.D.	Rho
Cross-section random	5.089775	0.1665
Idiosyncratic random	11.38812	0.8335

Weighted Statistics

Root MSE	11.30485	R-squared	0.172020
Mean dependent var	1.430179	Adjusted R-squared	0.150334
S.D. dependent var	12.43821	S.E. of regression	11.46521
Sum squared resid	55209.45	F-statistic	7.932577

Durbin-Watson stat      1.240455    Prob(F-statistic)      0.000000

---

---

Unweighted Statistics

---

---

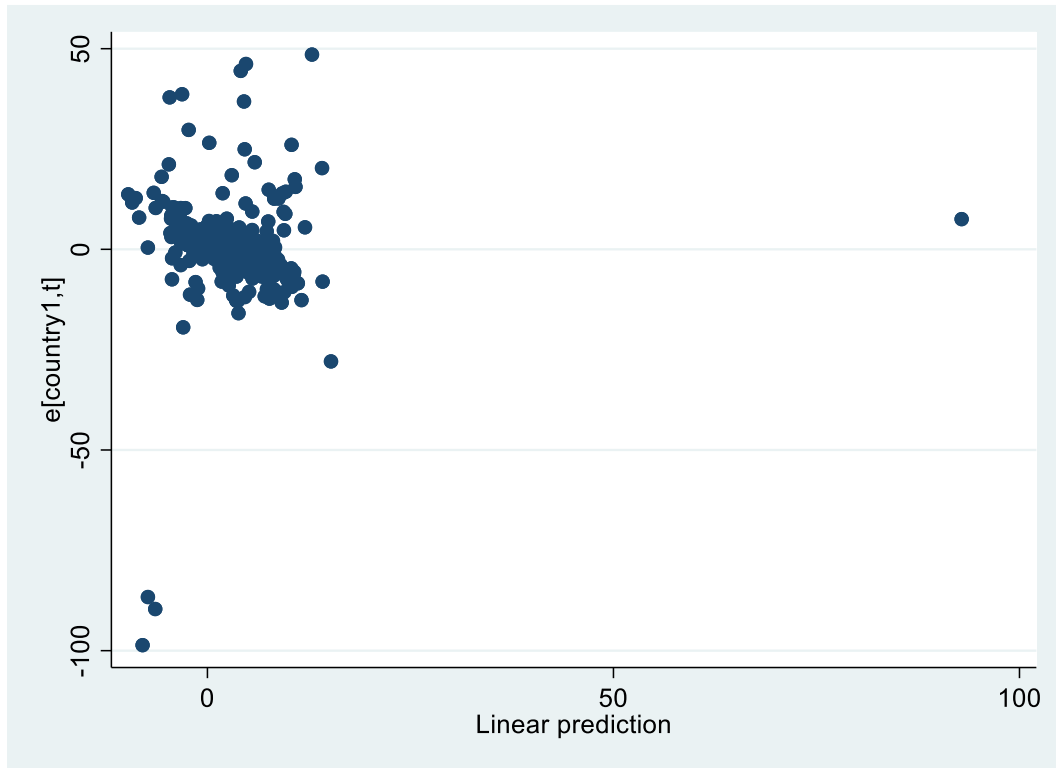
R-squared                0.217072    Mean dependent var      3.065908

Sum squared resid      67601.66    Durbin-Watson stat      1.013064

---

---

Test for Heteroscedasticity



```

. estimates store hetero

. xtglm ParallelPremium Corruption PolitalStability Devaluation BalanceOfPayment BroadMoneySupply
> GDP AID Inflation Remittance RealExchangeRate InterestRate , igls
Iteration 1: tolerance = 0

```

Cross-sectional time-series FGLS regression

```

Coefficients: generalized least squares
Panels:      homoskedastic
Correlation: no autocorrelation

```

```

Estimated covariances      =          1      Number of obs      =        432
Estimated autocorrelations =          0      Number of groups   =         24
Estimated coefficients     =         12      Time periods      =         18
Log likelihood             = -1702.472     Wald chi2(11)     =        124.78
                          =              Prob > chi2      =         0.0000

```

ParallelPremium	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Corruption	.2274995	.063695	3.57	0.000	.1026597	.3523394
PolitalStability	-.2703022	.0439908	-6.14	0.000	-.3565226	-.1840818
Devaluation	-.0000286	.019593	-0.00	0.999	-.0384301	.0383729
BalanceOfPayment	-.0026106	.0021917	-1.19	0.234	-.0069062	.0016851
BroadMoneySupply	-.0153274	.0370462	-0.41	0.679	-.0879367	.0572819
GDP	.0798927	.009988	8.00	0.000	.0603166	.0994688
AID	-.010263	.0092202	-1.11	0.266	-.0283343	.0078084
Inflation	-.0035143	.0334268	-0.11	0.916	-.0690297	.0620011
Remittance	-.0004672	.0012976	-0.36	0.719	-.0030105	.0020761
RealExchangeRate	.0003945	.0002608	1.51	0.130	-.0001167	.0009056
InterestRate	.4116443	.0814494	5.05	0.000	.2520064	.5712822
_cons	-2.870372	1.935735	-1.48	0.138	-6.664343	.9235985

```

. local df = e(N_g) - 1

. lrtest hetero . , df(`df')

Likelihood-ratio test
Assumption: _ nested within hetero

LR chi2(23) = 961.13
Prob > chi2 = 0.0000

```

### Endogeneity

```

. xtoverid

Test of overidentifying restrictions: fixed vs random effects
Cross-section time-series model: xtreg re
Sargan-Hansen statistic 16.705 Chi-sq(11) P-value = 0.1169

```

Multicollinearity

. vif

Variable	VIF	1/VIF
Inflation	1.71	0.583368
BroadMoney~y	1.59	0.628705
PolitalSta~y	1.59	0.629268
Corruption	1.42	0.702986
InterestRate	1.27	0.787766
Devaluation	1.18	0.848070
RealExchan~e	1.04	0.959162
GDP	1.03	0.975200
Remittance	1.02	0.982390
AID	1.01	0.989254
BalanceOfP~t	1.01	0.989543
Mean VIF	1.26	

. pwcorr ParallelPremium Corruption PolitalStability Devaluation BalanceOfPayment BroadMoneySuppl  
> y GDP AID Inflation Remittance RealExchangeRate InterestRate

	Parall~m	Corrup~n	Polita~y	Devalu~n	Balanc~t	BroadM~y	GDP
ParallelPr~m	1.0000						
Corruption	0.0301	1.0000					
PolitalSta~y	-0.1777	0.4735	1.0000				
Devaluation	0.0240	-0.0321	-0.0338	1.0000			
BalanceOfP~t	-0.0346	0.0041	0.0124	0.0135	1.0000		
BroadMoney~y	0.0501	-0.1019	-0.0375	0.2585	0.0792	1.0000	
GDP	0.3653	0.0399	-0.0544	-0.0152	0.0550	0.0832	1.0000
AID	-0.0372	-0.0757	-0.0558	0.0135	-0.0057	-0.0370	0.0187
Inflation	0.0549	-0.0687	-0.0799	0.3819	0.0147	0.5834	0.0144
Remittance	-0.0021	-0.0884	-0.0655	-0.0110	-0.0096	-0.0510	0.0121
RealExchan~e	0.0111	-0.0935	0.0802	0.0173	-0.0116	0.0144	-0.0304
InterestRate	0.1329	-0.0412	0.3073	0.1323	0.0115	0.2225	0.0198
		AID	Inflat~n	Remitt~e	RealEx~e	Intere~e	
AID	1.0000						
Inflation	-0.0117	1.0000					
Remittance	0.0439	0.0144	1.0000				
RealExchan~e	-0.0081	0.0604	0.0255	1.0000			
InterestRate	-0.0033	0.2128	0.0103	-0.0024	1.0000		

```
. ivregress 2sls ParallelPremium Devaluation BalanceOfPayment PolitalStability RealExchangeRate
> InterestRate AID (GDP Corruption = Inflation AID Remittance BroadMoneySupply)
```

```
Instrumental variables 2SLS regression          Number of obs   =       432
                                                Wald chi2(8)    =       39.40
                                                Prob > chi2     =       0.0000
                                                R-squared      =       0.1748
                                                Root MSE      =       12.843
```

ParallelPremium	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
GDP	.0277384	.1906564	0.15	0.884	-.3459413	.4014181
Corruption	.2489787	1.085203	0.23	0.819	-1.877981	2.375938
Devaluation	-.0052654	.0195024	-0.27	0.787	-.0434893	.0329586
BalanceOfPayment	-.0020505	.0031858	-0.64	0.520	-.0082945	.0041935
PolitalStability	-.2866696	.3562297	-0.80	0.421	-.984867	.4115277
RealExchangeRate	.0003686	.0008577	0.43	0.667	-.0013125	.0020496
InterestRate	.4226103	.2788485	1.52	0.130	-.1239226	.9691433
AID	-.0092263	.0116696	-0.79	0.429	-.0320983	.0136457
_cons	-2.892539	26.6884	-0.11	0.914	-55.20085	49.41577

```
Instrumented: GDP Corruption
Instruments: Devaluation BalanceOfPayment PolitalStability RealExchangeRate
              InterestRate AID Inflation Remittance BroadMoneySupply
```

```
. estat endogenous
```

```
Tests of endogeneity
H0: Variables are exogenous
```

```
Durbin (score) chi2(2)          =   .235009   (p = 0.8891)
Wu-Hausman F(2,421)            =   .114575   (p = 0.8918)
```

```
. estat overid
```

```
Tests of overidentifying restrictions:
```

```
Sargan (score) chi2(1) = .178228 (p = 0.6729)
Basmann chi2(1)      = .174175 (p = 0.6764)
```

. estat firststage

First-stage regression summary statistics

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	F(1,424)	Prob > F
Corruption	0.2886	0.2768	0.2698	156.684	0.0000

Minimum eigenvalue statistic = 156.684

Critical Values # of endogenous regressors: 1  
H0: Instruments are weak # of excluded instruments: 1

	5%	10%	20%	30%
2SLS relative bias	(not available)			
2SLS size of nominal 5% Wald test	16.38	8.96	6.66	5.53
LIML size of nominal 5% Wald test	16.38	8.96	6.66	5.53

Granger Causality Test

-----  
BIC selection:

lags = 1, BIC = 986.41766  
lags = 2, BIC = 1318.8116  
lags = 3, BIC = 1134.2635  
lags = 4, BIC = 963.77534\*

-----  
**Results for the Half-Panel Jackknife estimator**  
Cross-sectional heteroskedasticity-robust variance estimation

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Corruption						
L1.	-1.586986	.5678328	-2.79	0.005	-2.699918	-.4740543
L2.	.4067645	.2590646	1.57	0.116	-.1009928	.9145218
L3.	.6379308	.2879042	2.22	0.027	.0736489	1.202213
L4.	-.3901021	.237946	-1.64	0.101	-.8564677	.0762635

PoliticalStability						
L1.	-.2791246	.1582356	-1.76	0.078	-.5892607	.0310115
L2.	.2968816	.2040923	1.45	0.146	-.103132	.6968952
L3.	-.3868319	.1943727	-1.99	0.047	-.7677953	-.0058685
L4.	.1560508	.0549352	2.84	0.005	.0483798	.2637217
Devaluation						
L1.	-.0707523	.0474231	-1.49	0.136	-.1636998	.0221953
L2.	-.0343398	.0482158	-0.71	0.476	-.1288411	.0601614
L3.	-.1806646	.0777201	-2.32	0.020	-.3329931	-.0283361
L4.	.2415253	.12626	1.91	0.056	-.0059397	.4889903
BalanceOfPayment						
L1.	-.0064762	.0028824	-2.25	0.025	-.0121256	-.0008269
L2.	.0016951	.0018731	0.90	0.365	-.0019762	.0053663
L3.	.0019057	.0013701	1.39	0.164	-.0007796	.004591
L4.	-.0063306	.0030471	-2.08	0.038	-.0123029	-.0003583
BroadMoneySupply						
L1.	-.0471449	.0381311	-1.24	0.216	-.1218806	.0275907
L2.	.0420673	.0429812	0.98	0.328	-.0421743	.1263089
L3.	.0680463	.0443129	1.54	0.125	-.0188055	.1548981
L4.	.0180149	.0811707	0.22	0.824	-.1410767	.1771065
GDP						
L1.	-.0784328	.0726243	-1.08	0.280	-.2207738	.0639081
L2.	-.242951	.1446458	-1.68	0.093	-.5264516	.0405496
L3.	.0895573	.0499701	1.79	0.073	-.0083822	.1874969
L4.	-.16909	.0869105	-1.95	0.052	-.3394315	.0012514
AID						
L1.	.0029948	.0102769	0.29	0.771	-.0171475	.023137
L2.	.02144	.0171072	1.25	0.210	-.0120894	.0549695
L3.	-.01571	.0111406	-1.41	0.158	-.0375453	.0061252
L4.	-.0261132	.0091377	-2.86	0.004	-.0440228	-.0082037
Inflation						
L1.	-.0600457	.0722646	-0.83	0.406	-.2016816	.0815903
L2.	.3093941	.1032363	3.00	0.003	.1070547	.5117335
L3.	-.2580581	.1280217	-2.02	0.044	-.5089759	-.0071402
L4.	-.1009133	.1175663	-0.86	0.391	-.331339	.1295124

Remittance						
L1.	.0002304	.0008203	0.28	0.779	-.0013773	.0018381
L2.	-.0015754	.0007579	-2.08	0.038	-.0030608	-.00009
L3.	-.0004758	.0004655	-1.02	0.307	-.0013882	.0004366
L4.	.0002252	.0006423	0.35	0.726	-.0010337	.0014842
RealExchangeRate						
L1.	.0016796	.0013574	1.24	0.216	-.0009808	.00434
L2.	-.0012712	.0034083	-0.37	0.709	-.0079513	.0054089
L3.	-.0041624	.0015549	-2.68	0.007	-.00721	-.0011148
L4.	.0030172	.001813	1.66	0.096	-.0005361	.0065706
InterestRate						
L1.	-1.278768	.5360006	-2.39	0.017	-2.329309	-.2282256
L2.	.7661191	.3482438	2.20	0.028	.0835738	1.448664
L3.	-1.170049	.7240409	-1.62	0.106	-2.589143	.249045
L4.	-.0858129	.2952635	-0.29	0.771	-.6645188	.492893

---

