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# Sub-Saharan Africa's Risk Perception Premium: In the Search of Missing Factors

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**Sub-Saharan Africa's Risk Perception Premium: In the Search of Missing Factors  
Prepared by William Gbohoui, Rasmene Ouedraogo and Yirbehogre Modeste Some**Authorized for distribution by Jesmin Rahman  
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**ABSTRACT:** Policymakers from the sub-Saharan Africa (SSA) region often flag a mispricing of their sovereign debt presumably originating from a perception risk by international investors that lead to "unjustifiably" high borrowing costs. Against this background, this paper explores the extent to which a potential SSA premium exists in the financial markets following a broader two-fold approach. Firstly, using a sample of 1592 international primary sovereign fixed coupon bonds issued between 2003-2021 from Bond Radar by 89 countries, we find that SSA countries pay significantly higher coupon at issuance compared to their peers from other regions. Secondly, we assess whether there is any bias against SSA countries in the secondary market that would result in higher refinancing cost. Based on an unbalanced panel of quarterly data covering 107 countries over 1990 – 2022, we find that SSA countries pay higher refinancing costs in the secondary market. The paper further explores whether there are other factors overlooked by the literature that matter for the risk pricing by international investors. In that respect, we explore the sensitivity of spreads to some structural dimensions where SSA countries face acute challenges—the transparency of budget process, the importance of the informal sector, the level of financial development, and the quality of public institutions. The results show that the excess premium estimated for SSA countries vanishes when these structural factors are accounted for in the regressions.

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WORKING PAPERS

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Prepared by William Gbohoui, Rasmene Ouedraogo and Yirbehogre Modeste Some<sup>1</sup>

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<sup>1</sup> The authors would like to thank Akito Matsumoto, Sampawende Jules Tapsoba, Amadou Sy, Rahman Jesmin, Constant Lonkeng and participants of the African Department Seminar Series for helpful comments and suggestions.

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# I. Introduction

Borrowing from international financial markets by Sub-Saharan African (SSA) governments has grown exponentially over the past fifteen years. No SSA countries, except South Africa, have sold debt on private international markets before the issuance of Eurodollar bonds by Seychelles in 2006. As of 2021, fifteen countries from the region have tapped international markets, through the issuance of Eurobonds. Factors explaining this spike in SSA countries' access to international markets are twofold. For global investors, high potential return, and improved macroeconomic policies and development prospects, combined with low global interest rates, increased global liquidity and the needs for portfolio diversification have improved the attractiveness of SSA's sovereign bonds. For SSA countries, Eurobonds free up cash, offering an additional source for development financing without conditionalities, amid drying up of traditional concessional loans. Beyond infrastructure projects financing (Ghana 2007, Senegal 2009, Zambia 2011), SSA countries have issued Eurobonds to offer a benchmark to support the development of domestic bond markets or to ease the access of private sector to international financial markets (Nigeria 2011, South Africa), and in some cases for debt restructuring or management (Senegal 2011, Seychelles 2006, Gabon 2007).

Despite the high appetite for SSA's bonds from global investors, policymakers from the region often flag a mispricing of their sovereign debt presumably originating from a perception risk by international investors that lead to "unjustifiably" high borrowing costs. Yields on Eurodollar bonds issued by African countries have been above 5 percent at a time of exceptionally low global interest rates. In 2021, the average interest cost of outstanding sovereign debt in advanced economies fell to around 1 percent, while yields in 40 percent of African bonds exceeded 8 percent. A recent episode that laid support to the unfair risk premium sentiment by African leaders is the Eurobond issuance by Argentina. The Latin American country, that has defaulted on its debt on nine occasions,<sup>1</sup> issued a 100-year bond in 2017 with a coupon of 7 percent, which to the surprise of many was oversubscribed. By comparison, Angola has not defaulted since the end of its civil war in 2002 and was charged a higher rate of over 9 percent for much shorter-dated (30-year) bonds issued in 2018. Its 10-year Eurobond issued in 2015 carried a yield of 9.5 percent.<sup>2</sup> One could argue that the interest rates, terms of bonds and coupon payments are determined by market conditions and reflect investors' default risk perceptions. Typically default risks reflect country-specific characteristics. But, in some cases, it is impossible for lenders to have full information on borrowers. Investors hence rely on ratings from credit rating agencies (CRA) to gauge the ability and willingness of any given sovereign to meet its financial obligations fully and on time. For instance, credit ratings are a

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<sup>1</sup> For further details, please refer to Bertelsmann Stiftung, BTI 2022 Country Report — Argentina. Gütersloh: Bertelsmann Stiftung, 2022 or [Argentina: A historical analysis of the state's fiscal Gordian Knot](#), or

<sup>2</sup> IMF Country Report No. 18/370

core requirement for issuing Eurobond as they determine the conditions and the costs under which governments access capital markets. In that respect, the high interests charged to SSAs mainly reflect their sovereign ratings by credit rating agencies.

Criticisms are not only voiced in Africa and go beyond ratings. The 2022 UN's Inter-Agency Task Force on Financing for Development highlights the inequity of the world's leading rating agencies that are very severe against developing countries and lenient towards rich nations. It shows that developed countries, which saw much larger debt increases and economic slowdowns, largely escaped downgrades during the COVID19 pandemic reinforcing their access to ample, cheap market financing. The issue became more salient at the onset of COVID-19 when many African countries were reluctant to sign-up for measures that would otherwise have benefited them, due to fears of future credit rating downgrades.<sup>3</sup> Credit rating agencies have also been severely criticized in the aftermath of the Asian financial crisis and more recently during the debt crisis in Europe after the 2008 global financial crisis for the lack of transparency in their grading methodology, the lack of competition in the credit rating market, concerns of conflicts of interests inherent to their income model. Echoing these critics, Germany's finance minister said back in 2011: "We need to break the ratings agencies' oligopoly".<sup>4</sup> During the 2020 annual meetings, IMF's Managing Director commented that the world needs to concentrate on reducing the perceived and real risk for investing in Africa.<sup>5</sup> For some analysts, the interest costs charged to Sub-Saharan countries by international investors are disproportionately larger than justified by their sovereign ratings, suggesting that the alleged bias goes beyond the grading by credit agencies. A striking example that lends support to this argument is South Africa. The African economic powerhouse is charged higher rates by bondholders than Brazil, which is assigned a similar credit score by S&P Global Ratings. Similarly, Kenya pays more for a 10-year dollar debt than similarly rated Bolivia. In SSA, grading could fail to accurately reflect macroeconomic fundamentals and underlying risks given the greater role of analysts' judgments about political risks and "willingness to pay" in these countries. In that respect, investors may be pricing other risks beyond those reflected in ratings, resulting in disproportionate borrowing costs compared to countries with similar ratings.

Against this background, this paper explores the extent to which a potential Sub-Saharan African premium exists in the financial markets, following a broader two-fold approach. Firstly, we document heterogeneity in borrowing costs across regions at issuance and assess whether SSA countries are charged higher costs of borrowing— including beyond what can be explained by credit ratings, and other bond issuance characteristics — at issuance in the primary market. Using a sample of 1592 international

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<sup>3</sup> Ethiopia, Cameroon, Senegal, and Côte d'Ivoire, among others, were placed under review for downgrades by the Moody's credit rating agency in May and June 2020 after requesting bilateral debt service suspension from G20 creditors.

<sup>4</sup> See Ioannis Papadopoulos. 2022. European Economic Governance after the Eurozone and COVID-19 Crises, [Cambridge Scholars Publishing](#), Page 287; [Barroso hits out at bias in downgrades \(cityam.com\)](#), or here [Are ratings agencies hurting Africa? – DW – 03/12/2019](#)

<sup>5</sup> <https://jordantimes.com/opinion/hippolyte-fofack/high-cost-underrating-africa>

primary sovereign fixed coupon bonds issued between 2003-2021 from Bond Radar by 89 countries, we find that SSA countries pay significantly higher coupon at issuance compared to their peers from other regions even after controlling for their risk rating at issuance. Secondly, we assess whether there is any bias, against SSA countries in the secondary market that would result in higher refinancing cost—not explained by country specific characteristics (political, economic, and financial risk ratings, and history of defaults) and the state of global financial markets as measured by global risk factors. Based on an unbalanced panel of quarterly data covering 107 countries over 1990 – 2022, we find that SSA countries pay higher refinancing costs in the secondary market. Overall, these results suggest that SSA countries pay both at issuance and in the secondary market a risk premium that is not explained by the traditional determinants of yields studied in the literature.

The paper digs deeper on the drivers of the Africa premium, assessing whether there are other factors overlooked by the literature that matter for the risk pricing by international investors. In that respect, we take a further step exploring the sensitivity of spreads to some structural dimensions, where SSA countries face acute challenges—the transparency of budget process, the importance of the informal sector, the level of financial development, and the quality of public institutions. For instance, a more transparent budget system increases the quality of publicly available data on the state of public finances and could improve investor confidence. Likewise, efficient public institutions improve the ability of governments to formulate and implement sound macroeconomic policies, critical to enhance the sustainability of public finances. A large informal sector is likely to drive high borrowing costs as it reduces the ability of government to raise revenue to honor its debt obligations. Similarly, investors are likely to charge high premia for countries with under-developed domestic financial markets to hedge against the risks of bonds' illiquidity. The results show that the excess premium estimated for SSA countries vanishes when these structural factors are accounted for in the regression. The results are robust to several robustness checks. These findings suggest these factors are the potential drivers of the excessive borrowing cost faced by SSA countries in international financial markets.

The paper makes several contributions to the literature. First, we shed further light on the determinants of bond yields both at bond issuance and in the secondary market. Our analysis is broader in the sense that it includes bond-level analysis using sovereign fixed coupon Eurobond characteristics and ratings at issuance from Bond Radar database to document regional borrowing costs heterogeneity. Second, this is the first paper, to our knowledge, that uncovers the drivers of the apparent premium paid by SSA countries in international markets. A few papers have found that African countries pay more than others to borrow but none systematically explore the determinants of the high borrowing cost imposed to SSA countries. The analysis in this paper is of key importance for policymakers in Sub-Saharan Africa. For instance, sovereign risk management should ensure that the government's financing needs are met at the lowest possible cost given a certain level of risk. Therefore, identifying the key drivers of bond spread is critical for sound sovereign risk management policies to minimize risks and, in turn, achieve macroeconomic stability of the wider economy. The results suggest that reforms to improve the transparency of budget process, strengthen the quality of public institutions, to create a business environment conducive for the development of the private sector and reduce informality, and measures to deepen domestic financial markets would help ensure that the government's financing needs are met at the lowest possible cost.

The remainder of the paper is organized as follows. Section II briefly discusses the literature. Section III presents data sources and discusses some stylized facts. Section IV lays out the empirical strategy which results are discussed in section V with a set of robustness exercises. Section VI is devoted to concluding remarks.

## II. Review of literature

The literature on sovereign risk premium determinants is considerable. Sovereign bond yields and Credit Default Spreads (CDS) are the most common variables widely considered as comprehensive measures of countries' overall risk premium stemming from market, credit, liquidity, and other risks. The literature has covered both developing, emerging, and developed economies with many studies focusing on the relationship between sovereign risk premia and various macroeconomic variables (Ferrucci, 2003; Eichengreen and Mody, 1998; Presbitero et al., 2016; McGuire and Schrijvers, 2003; Dell'Erba et al., 2013, Fontana and Scheicher, 2016; Dooley and Hutchison, 2009; Remolona et al., 2008).<sup>6</sup> On the one hand, some empirical work emphasize the importance of domestic factors such as macroeconomic fundamentals, liquidity and solvency institutions and policies. A seminal paper by Edwards (1985) on the drivers of government bond yields found that domestic macroeconomic fundamentals, including public debt, foreign reserves, current account balance and inflation, were important determinants of the sovereign risk price. Terms of trade, political risks, fiscal balances, exchange rate regimes and the state of monetary policy have also been considered as key determinants of sovereign risk premia (Min et al. 2003, Grandes 2007, Gumus 2009, Hilscher and Nosbusch 2010, Baldacci et al. 2011, Martinez et al. 2013). On the other hand, other researchers highlight global factors as important drivers of sovereign risk premia (Ozatay et al. 2009, Dailami et al. 2008, Ferrucci 2003, Banerji et al. 2014, Kennedy et al. 2014). Ferrucci (2003) finds that the fall in sovereign spreads between 1995 and 1997 could not be totally explained by an improvement in domestic fundamentals. González and Levy-Yeyati (2008) find that global factors, such as risk appetite, global liquidity and contagion effects explain a large variation of country sovereign risk. Focusing on 18 emerging markets between 1997 and 2006, Ozatay et al. (2009) conclude that the long run dynamics of the EMBI spreads depend on the effect of US macroeconomic news. Changes in market sentiments, proxied by market volatility indexes, as well as US interest rates and their volatility have also been found as important global factors driving sovereign bond spreads (Gueye and Sy 2015, Hartelius et al. (2008) Sy 2002, Arora and Cerisola 2000, Kamin and von Kleist 1999, Eichengreen and Mody 1998).

Despite the extensive studies on sovereign risk premium determinants, the literature on Sub-Saharan Africa is relatively scant and the empirical evidence is not conclusive. A key question examined by the few authors that focused on SSA is whether the borrowing cost for SSA countries accurately reflects

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<sup>6</sup> Ozatay and others (2009) provide for a survey of the literature.

underlying sovereign risks. Gueye and Sy, 2015 estimate the hypothetical bond spreads for 19 SSA countries between 2000 and 2009 based on push (global conditions and factors related to lending countries that drive investors' behavior) and pull factors (country specific and largely dependent on policies in borrowing countries) and find that SSA country bonds are overpriced. They find that SSA country actual bond spread is 338 basis points below what is implied by fundamentals. Olabisi and Stein (2015) regressed the sovereign bond spreads at issuance on measures of macroeconomic fundamentals, bond agency ratings, as well as other bond characteristics (time dummies to capture the quarter of issuance, bond type, and bond tenor) using data covering 112 countries for the period 2006 to 2014. Fixed effects dummy variables are included in the regression to capture region, continent and HIPC debt relief participation. They find that governments in sub-Saharan Africa pay about 2.9% points more to borrow from international financial markets compared to other countries, even after controlling for relevant factors like the characteristics of the bonds, the credit ratings of issuers and their macroeconomic fundamentals (government debt ratios, trade balance, foreign reserves, rating). More recently, Morsy and Moustafa (2020) examined whether African debt assets are mispriced and treated as one asset class, instead of being priced based on macroeconomic fundamentals. Using a sample covering 55 countries, including 17 African countries over 2004-2019, they find asymmetric and herding behavior from international investor's which results in clustering African debt assets as one category. Moreover, based on the Blinder-Oaxaca decomposition approach, they show that the mispricing of Africa's sovereign risk is mainly due to discriminatory behavior by international investors rather than to differences in macroeconomic fundamentals between Africa and non-Africa regions.

This inconclusiveness of the literature regarding the accuracy of risk premium in Africa suggest that the empirical evidence might be missing some factors that affect international investors' pricing of SSA sovereign risks. For instance, Choi and Hashimoto (2018) has shown that market participants react positively to reforms to improve data transparency, as reflected in subscriptions to the IMF's Data Standards Initiatives, leading to a reduction of sovereign by about 13 percent over one year following the adoption of the reforms. Similarly, Kemoe and Zhan (2018) find that higher fiscal transparency reduces sovereign interest rate spreads and increases foreign holdings of sovereign debt in a sample of 33 emerging and developing economies. The degree of financial development could also affect sovereign spreads. For instance, the two-way interaction between banks and governments suggests that vulnerabilities in domestic financial markets could potentially impact the default probability of the sovereign, including through the balance-sheet linkages, and in turn drive sovereign spreads (Caprio and Honohan 2008, Caruana and Avdjiev 2012). Aktug et al. (2013) has shown that banking sector characteristics such as concentration, liquidity, and the size of financial system are significantly related to sovereign credit ratings. Given the importance of sovereign rating in determining the borrowing cost of governments, spreads could be higher in countries where the domestic debt market is underdeveloped. Other variables commonly overlooked in the literature of sovereign risk pricing that could affect international investor' assessment of African debt include the degree of informality and the quality of

public institutions. For instance, using a sample of 26 countries over the period 2003-2014, Chen and Chen (2018) show that better-quality governance enhances a country's willingness to repay debt, and hence reduces the probability of sovereign default. In the same vein, Huang et al. (2019) find that an improvement in institutional quality significantly lowers a country's sovereign credit default swap (CDS) spread, even after controlling for domestic and global macroeconomic factors using a sample of 70 countries over the period 2000-2015. High informality could increase sovereign spreads as higher informality is associated with a lower tax base, lower de-facto fiscal space, and higher sovereign spreads (Aizenman and Jinjarak, 2012).

The analysis in this paper builds on the existing literature on sovereign risk pricing while unveiling the role of these missing factors in explaining the apparent "Africa risk premium".

### III. Data sources and stylized facts

In this section, we provide an overview of the data used for the analysis and some descriptive stylized facts. More specifically, our analysis explores regional heterogeneity in sovereign issuances from the primary as well as the secondary international sovereign bond markets.

#### A. Data sources

We collect from Bond Radar a total of 1592 international primary sovereign fixed coupon bonds issued in USD and Euro between 2003-2021 from 89 countries. The dataset includes coupon rates, maturity date, issuance date, the country risk ratings at the issuance date, and other bond characteristics. Country effective risk ratings data, based on Fitch or S&P sovereign risk ratings, are converted into a numerical scale from 1 for an AAA rating to 23 for a D rating. Only bonds issued outside of the issuing country's jurisdiction are retained for the analysis and financial centers and other advanced economies are excluded.

The data on bond spread is extracted from Bloomberg and comprises an unbalanced panel of 107 countries including Advanced economies as well as Emerging market and Frontier market countries from 1990 – 2022 at the quarterly frequency. Bond spread is measured by the JP Morgan's Emerging Market Bond Index spread or the CDS spread when the EMBI spread is not available.

In the literature, there is a large variety of determinants of sovereign spread including country specific macroeconomic fundamentals (real GDP growth, inflation, terms of trade, current account balance, public debt) as well as global factors. Given the large number of country specific variables used to explain cross-country differences in sovereign spread, we rely on quarterly data from the International Country Risk Guide (ICRG) rating in the baseline model for the determinants of sovereign spreads. The ICRG model is

used by many agents including institutional investors, banks, multinational corporations, foreign exchange traders, and others to determine how financial, economic, and political risk might affect their business and investments now and in the future. The advantage of the ICRG rating is that it presents a comprehensible risk structure including liquidity, solvency, macroeconomic and external shocks that affect the probability of sovereign default for a given country using 22 risk components within 3 subcategories of risk indices: political (12 components including risks arising from government stability, corruption, conflicts (internal and external), investment profile, socioeconomic conditions, law and order, bureaucracy quality, democratic accountability, ethnic tensions, religion tensions, military in politics), financial (5 components including risks from foreign debt/GDP, foreign debt service to exports, current account/exports, international liquidity, exchange rate stability), and economic (5 components including risks from GDP per capita, real growth, inflation, budget balance, current account) risk indices. The components are constructed based on political information and economic and financial data converted into risk points for each category such that higher values reflect lower risks for each of the 3 risk indices. These risk factors are complemented with country specific history of fiscal crisis dummies to capture the impact of past country specific fiscal crises on the risk of sovereign default. To capture global financial risk and liquidity, the VIX index and the federal fund rate from the St-louis Federal Reserve website, are also included in the analysis. Other country specific fundamentals (fiscal crises, diversification index, size of informal sector, transparency) are annual data (from the IMF and the World Bank's World Development Indicators dataset), which have been interpolated. We use the debt crisis from Medas et al. (2018), which focuses on extreme and disruptive episodes of fiscal policy.

Since our analysis focuses on sub-Saharan countries (SSA) sovereign bond pricing relative to countries from other regions, regional dummy variables are included in the analysis to capture heterogeneity across regions.<sup>7</sup>

## B. Stylized facts

**Sub-Sharan Africa (SSA) country international sovereign issuances.** Between 2006-2021, 15 SSA countries have issued fixed coupon international sovereign bonds typically in Euro and USD. Most SSA

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<sup>7</sup> The regional distribution of the sample is as follows: 14 countries from SSA (Angola, Benin, Cameroon, Côte d'Ivoire, Ethiopia, Gabon, Ghana, Kenya, Namibia, Nigeria, Senegal, South Africa, Tanzania and Zambia), 11 countries from Asia-Pacific (China, Fiji, Hong Kong, India, Indonesia, Malaysia, Mongolia, Papua New Guinea, Philippines, Sri Lanka, Vietnam), 13 countries from developing Europe (Albania, Belarus, Bulgaria, Croatia, Hungary, Montenegro, North Macedonia, Poland, Romania, Russia, Serbia, Turkey and Ukraine), 24 countries from Latin America (Argentina, Aruba, Bahamas, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela), 19 countries from the Middle East and Central Asia (Armenia, Azerbaijan, Bahrain, Egypt, Georgia, Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Tajikistan, Tunisia, United Arab Emirates, and Uzbekistan.) and, 8 Advanced Economies (Czech Republic, Estonia, Israel, Korea, Latvia, Lithuania, Slovak Republic, Slovenia).

countries have not issued bonds in Euro or USD before 2010 except for Gabon, Ghana, Seychelles and South Africa. Yearly issuance amounts have been relatively small compared to other regions (Figure 1.A) and below USD 5 billion before 2013 but mainly picked up starting from 2014 with record issuances in 2018 and 2019 (USD 19.2 billion and USD 15.5 billion respectively). In 2020, although there was a record EMs issuance of Eurobond, SSA country Eurobond issuances significantly dropped to USD 5 billion, partly reflecting worsening global financial conditions following the Covid 19 pandemic, before bouncing back in 2021 (USD 13.5 billion). Maturities of SSA country bond issuances are concentrated around 10-year although a few countries have recently issued bonds with maturity as long as 30-year (Angola (2019), Cote d'Ivoire (2018), Ghana (2019), Kenya (2018), Nigeria (2021), Senegal (2018), South Africa (2019)) and 40-year (Ghana, 2020).

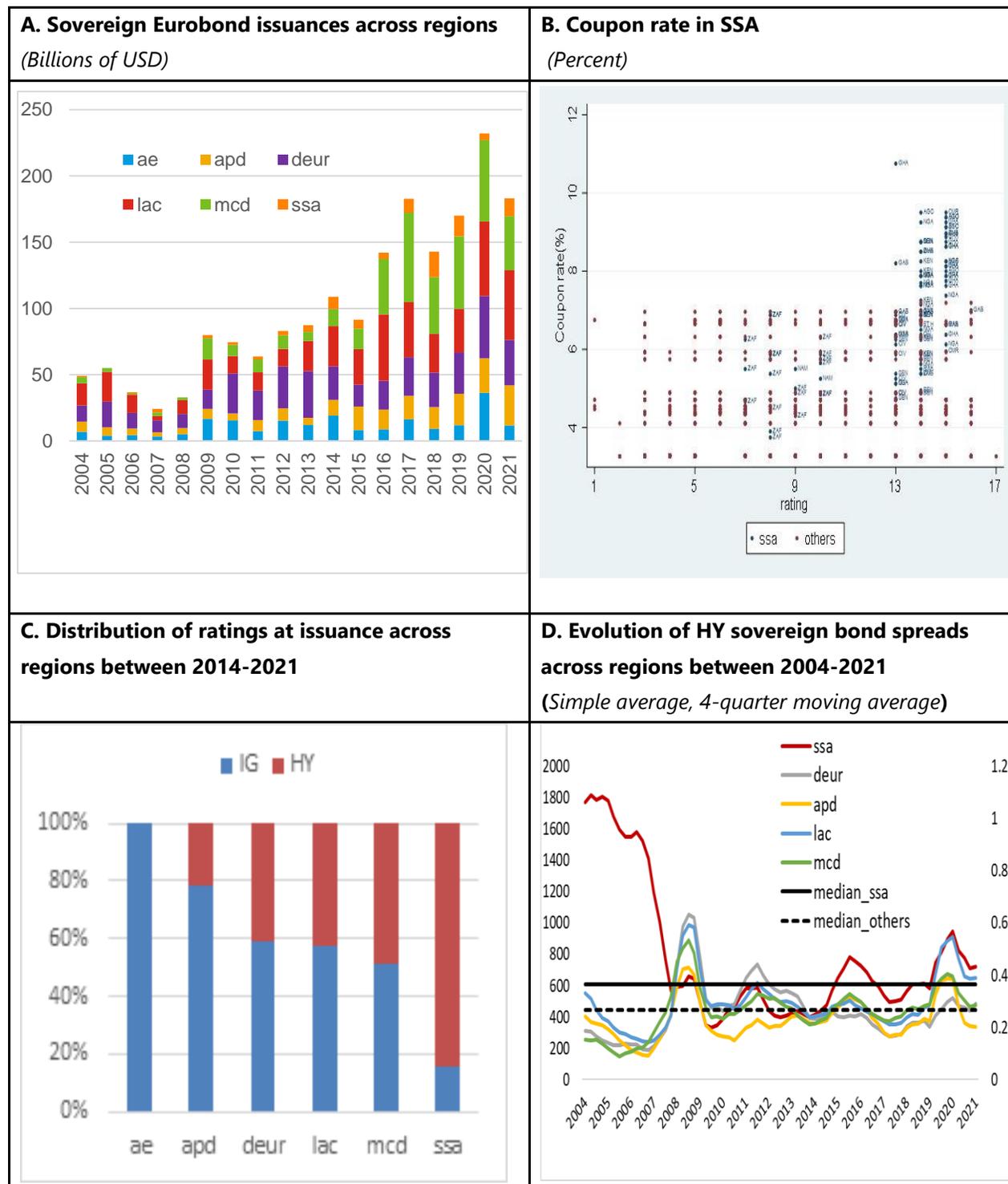
**Sovereign rating.** Except for South Africa and Namibia, none of SSA issuers have ever had an investment grade (IG) rating at issuance and since 2019, all SSA countries' sovereign foreign currency bonds are rated HY by all rating agencies. Between 2014-2021, around 85 percent of SSA country issuances are rated HY compared with 38 percent for EMDEs from other regions (Figure 1.C).<sup>8</sup> Among high yield (HY) SSA issuers the best rating at issuance was BB- awarded to Cote d'Ivoire (2017-2021), Gabon (2013), Ghana (2015), Nigeria (2011, 2013) and Senegal (2017-2021), and the worst rating B- went to Gabon in 2021. Between 2010-2021, only 3 countries have improved their rating (Cote d'Ivoire, Senegal, Rwanda) while 5 countries experienced downgrades (Angola, Gabon, Ghana, Nigeria, Zambia).

**Sovereign rating and coupon rates.** On average between 2004 and 2021, SSA countries paid around 2.1 percentage points higher coupon rate than countries from other regions.<sup>9</sup> This partly reflects the fact that most SSA countries have HY sovereign bond ratings (Figure 1.C) at issuance. Even among the HY issuers, the average cost of issuance is higher for SSA than that of their peer EMDEs from other regions. Across all maturities, the average coupon rate for SSA issuances is persistently higher by 1.3 percentage points per year than the average coupon rate of EMDE countries from other regions between 2014 and 2021 (Figure 1.B).

<sup>8</sup> In the sample, of the 13 SSA country issuances with IG between 2014-2021, 12 were issued by South Africa and 1 for Namibia (2015).

<sup>9</sup> Note that in 2021 Ghana was the first African country to issue a zero-coupon Eurobond.

**Figure 1: Sovereign Bond Issuances and Credit Ratings Across Regions over 2004-2021**



**Sovereign spread.** Figure 1.D shows the evolution of average HY Eurobond sovereign spreads across regions since 2004 excluding outlier cases that lost access to international financial markets. It is clear that outside of the global financial crisis in 2008 and the Euro area debt crisis in 2011, the average spread for SSA countries tends to be higher than that of countries from other regions. Between 2014–2021, SSA countries borrowed in the Eurobond market at higher cost than their peers from other regions by 155 basis points on average.

## IV. Empirical strategy

To have a sense of potential differentiated treatments of countries by the international financial market investors, we take a broader approach by first exploring country borrowing costs at issuance in the primary market. Second, we investigate any existing “bias” by the market towards SSA countries in the secondary market, that would imply higher refinancing cost, and explore potential determinants of this “bias”.

In the primary market, we compare SSA country borrowing costs with those of countries from other regions controlling for different bond characteristics. To that end we consider sovereign fixed coupon Eurobond issuances since 2004 by estimating the following model:

$$\text{LnCoupon}_{it} = c + \alpha Z_{it} + \gamma \text{SSA} + \pi_t + v_{it} \quad (1)$$

Where  $\text{LnCoupon}_{it}$  is the natural log of coupon rate of country  $i$  at issuance date  $t$ ,  $Z_{it}$  is a set of bond characteristics including sovereign rating, maturity and volume.  $\pi_t$  is time fixed-effects, and  $\text{SSA}$  is a dummy variable taking 1 if the country is from SSA and 0 otherwise. The coefficient  $\gamma$  captures any potential bias of the market towards countries, and  $v_{it}$  is the error term.

For the analysis in the secondary market, we estimate the following equation using panel fixed-effects model:

$$\text{LnSpread}_{it} = \beta X_{it} + \pi_t + \mu_i + \varepsilon_{it} \quad (2)$$

Where  $\text{LnSpread}_{it}$  denotes the natural logarithm of sovereign bond spreads of country  $i$  at time  $t$ ; the vector  $X_{it}$  represents a set of control variables. It includes 4 country-specific factors such as the economic risk rating, the financial risk rating, the political risk rating, and the experience of debt default.  $\pi_t$  denotes a vector of global variables or time-fixed effects to control for common shocks including commodity price fluctuations across countries. We control for 2 global risk factors including the implied volatility of U.S.

stock market returns (VIX) and the US Federal Funds rate.  $\mu_i$  stands for country-fixed effects to capture time-invariant country characteristics that are related to bond spreads and  $\varepsilon_{it}$  is the error term.

We further include a binary variable taking the value of 1 if a country is from the SSA region and 0 otherwise in equation (3) below to check whether sub-Saharan African countries are paying a risk premium. Equation (3) is as follows:

$$\text{LnSpread}_{it} = \omega X_{it} + \vartheta \text{SSA} + \pi_t + \varepsilon_{it} \quad (3)$$

Our coefficient of interest in equation (3) is  $\vartheta$ . If  $\vartheta$  is significant and positive, then sub-Saharan African countries are paying a risk premium compared to the rest of the emerging countries, i.e. sovereign bonds in SSA are undervalued. If  $\vartheta$  is significant and negative, then sovereign bonds in SSA are overvalued. If  $\vartheta$  is not significant, then there is no specific risk premium for SSA countries.

Estimation of (3) with country-fixed effect (FE) will help identify the coefficients of time-varying variables in X. However, FE estimation of (3) would make our coefficient of interest unidentified as SSA is time-invariant. In a robustness check, we use the two steps approach proposed by Pesaran and Zhou (2018) to address the issue of potential bias due to omitted time-invariant factors. In the first step, we run a FE regression (3) without the SSA dummy. In the second step, we run the residuals from the first step on the SSA dummy.

## V. Results

### a. Baseline results

- **Bond-level (Primary market) analysis**

Borrowing cost at issuance. Estimation results of (1) suggest that, on average, SSA countries incurred higher cost to issue Eurobond over the period 2004-2021. Column (1) of Table 1 suggests that the average (unconditional) coupon rate for SSA countries was around 66 percent higher than the average coupon rate of countries from other regions. Although EMDE countries from other regions also pay more than the group of Advanced economies, the premium for SSA countries is the highest (Column (2)). This partly reflects the fact that almost all SSA countries' sovereign bonds are high yield (HY) and in general HY bonds pay a premium relative to the investment grade bonds. However, even after controlling for rating, SSA countries still pay significantly higher coupon compared to their peers from other regions even after controlling for bond characteristics (Columns (3)-(5)). This confirms the evidence from the descriptive analysis in Figure 1.B that SSA countries pay on average higher coupon rates among HY bond issuers.

In general, a downgrade of sovereign rating tends to increase coupon rates (Column (5)) but the fact that the coefficient of the interaction of sovereign rating with the SSA dummy is significant (Column (6)) suggests that for the same magnitude of downgrade, SSA country coupon rates would increase more relative to the increase for peers non-SSA countries. This result is once again partly driven by the fact that SSA countries have poorer sovereign ratings. In fact, column (7) suggests that downgrades for HY bonds lead to higher increases in borrowing cost relative to downgrades of IG bonds.<sup>10</sup>

**Table 1: Determinants of Sovereign Eurobond Coupon at issuance.**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SSA	0.506*** (0.028)	1.155*** (0.067)	0.234*** (0.028)	0.286*** (0.029)	0.215*** (0.027)		
APD		0.556*** (0.083)					
EUR, developing		0.666*** (0.071)					
LAC		0.865*** (0.068)					
MCD		0.797*** (0.068)					
High Yield			0.714*** (0.027)	0.664*** (0.025)	0.422*** (0.036)	0.419*** (0.036)	
Not Rated			0.509*** (0.057)	0.189*** (0.065)			
Rating*SSA						0.084*** (0.011)	
Rating*High Yield							0.179*** (0.014)
Rating, Log					0.456*** (0.048)	0.457*** (0.048)	0.444*** (0.049)
Maturity, Log					0.211*** (0.024)	0.211*** (0.024)	0.221*** (0.024)
Volume, Log					0.064*** (0.018)	0.064*** (0.018)	0.065*** (0.018)
Sinkable					0.203*** (0.085)	0.196** (0.086)	0.303*** (0.080)
Callable					0.133*** (0.042)	0.134*** (0.042)	0.115*** (0.041)
Constant	1.393*** (0.018)	0.744*** (0.063)	1.100*** (0.024)	1.703*** (0.074)	-0.510*** (0.195)	-0.510*** (0.196)	-0.576*** (0.196)
Observations	1592	1592	1592	1592	1448	1448	1448
Adjusted R-squared	0.035	0.184	0.275	0.448	0.541	0.541	0.540
Time fixed effects				Yes	Yes	Yes	Yes

Note: Robust standard errors in parentheses. Significance levels: \* 0.10 \*\* 0.05 \*\*\* 0.01.

lnmaturity; lnvolume; and lnrating are logs of issuance tranche maturity; volume; and numerical rating respectively.

For lnrating ratings are S&P or Fitch ratings. Numerical rating ranges from 1 (AAA) to 23 (D) so that higher numbers reflect lower ratings

Note: Dependent variable is ln(coupon). The sample includes fixed coupon sovereign bond issuances in USD and Euro between 2009-2021 and observations are tranches of issuances by sovereigns

Robust standard errors in parentheses. Significance levels: \* 0.10, \*\* 0.05, \*\*\* 0.01.

<sup>10</sup> Note that although we control for bond characteristics such as volume, maturity, rating, etc. at issuance, we do not explicitly control for a measure of bond liquidity as bid and ask prices and bond market size at time of issuance are not available. The higher borrowing costs for SSA might partly be explained by the fact that their sovereign bonds are less liquid. In the secondary market analysis, we control for financial development which is positively correlated with bond liquidity.

Inmaturity; Involume; and Inrating are log of issuance tranche maturity; volume; and numerical rating respectively.

Ratings are S&P or Fitch ratings. Numerical rating ranges from 1 (AAA) to 23 (D) so that higher numbers reflect lower ratings. Not rated numerical value is 27.

SSA=Sub Saharan Africa, APD=Asia-Pacific, EUR, developing=Developing Europe, MCD=Middle East and Central Asia, LAC=Latin America and Caribbean,

- **Country level (Secondary market) analysis**

Our baseline results for the secondary market analysis are reported in Table 2. In column (1), we present the results for the full sample of countries. The findings are broadly in line with expectations. We first focus on country-specific factors. The coefficients associated with the economic, the financial and the political risk ratings are all negative and strongly significant. In general, countries with stronger fundamentals are likely to have lower sovereign bond spreads. As in Csonto and Ivaschenko (2013), we find that the financial and political fundamentals have stronger effects on the spreads than economic fundamentals. The size of the coefficients associated with the political and financial risk ratings are nearly 4 times higher than the one associated with the economic risk rating. An increase of the financial and political risk ratings by 1 percent is associated with a reduction of the spreads by around 2 and 2.7 percent, respectively, while a rise of the economic risk rating by 1 percent decreases the spreads by around 0.7 percent. Investors are thus more sensitive to political and financial developments, which could be highly brutal, than economic developments.

Table 2 shows that the coefficients associated with the binary variable "debt crisis" is positive and strongly significant at the 1 percent level. Experiencing debt crisis in the past is associated with an increase of the spreads by 0.2 percent. Reinhart et al. (2003) argued that a country's history of default is a key predictor of future default because some countries tend to be "serial defaulters". Therefore, countries with recent default episodes usually have higher spreads.

Regarding global factors, we find that the coefficients associated with the VIX index and the US Federal Funds rate are positive and highly significant at the 1 percent level. As expected, international high-risk aversion, measured by the implied volatility of U.S. stock market returns (VIX), and a tightening of global financial conditions affect positively countries' bond spreads. An increase of the VIX index and the US Federal Funds rate by 1 percent is correlated with an increase of the spreads by around 0.3 percent and 0.2 percent, respectively.

**Table 2: Baseline results**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	All	Non-SSA countries	Non-SSA emerging countries	SSA countries	SSA dummy
Economic risk, Log	-0.7149*** (0.231)	-0.7190*** (0.250)	-0.5406** (0.231)	0.7874 (0.851)	-0.7126*** (0.231)
Financial risk, Log	-1.9522*** (0.313)	-1.8597*** (0.365)	-1.6792*** (0.311)	-2.9287*** (0.967)	-1.9545*** (0.313)
Political risk, Log	-2.6734*** (0.388)	-2.5427*** (0.343)	-2.2983*** (0.353)	-1.5812** (0.762)	-2.6265*** (0.389)
US Federal Fund rate	0.1859*** (0.047)	0.2696*** (0.062)	0.1956*** (0.066)	-0.1446 (0.097)	0.1854*** (0.047)
VIX, Log	0.3490*** (0.109)	0.4067*** (0.120)	0.4807*** (0.165)	-0.3244 (0.249)	0.3497*** (0.109)
Debt crisis, Lagged	0.2446*** (0.046)	0.2556*** (0.048)	0.2676*** (0.053)	0.3964** (0.172)	0.2435*** (0.046)
SSA					0.5109*** (0.130)
Constant	24.6688*** (1.999)	23.4585*** (1.885)	21.3801*** (1.901)	21.8418*** (4.951)	24.3957*** (1.993)
Observations	4,508	3,969	3,082	539	4,508
Number of countries	87	74	53	13	87
R-squared	0.6289	0.6265	0.6096	0.5883	0.617

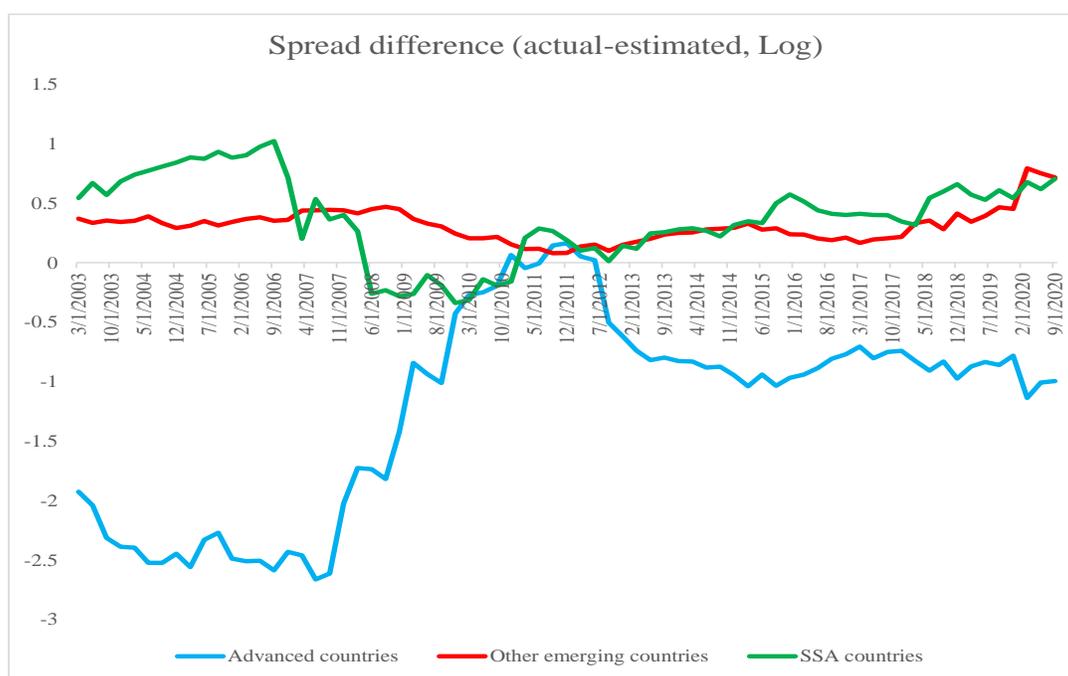
Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

We split the full sample of countries into 2 sub-samples in columns 2 and 3. We display in column (2) the results for the sample of non-sub-Saharan African (SSA) countries and in column (4) the results obtained when we focus on SSA countries. Advanced economies are excluded in column (3). We find that while the coefficients associated with all variables are significant and in line with the results in column (1), those associated with the economic risk rating and the two global factors are not statistically significant on the sample of SSA countries in column (4). This finding suggests that investors are not sensitive to economic developments and global conditions when investing in sub-Saharan Africa. This result could be explained by the limited linkages of SSA countries with the global financial markets. As for the remaining variables, we find that the coefficients associated with the financial risk rating and debt crisis are higher in column (4) than in columns (2) and (3), implying that investors are more sensitive to financial developments and risk of sovereign debt default in sub-Saharan African than in the rest of the world. On the contrary, the coefficient associated with the political risk rating is lower in SSA than in the rest of the world. This finding suggests that investors are weakly pricing in political risks into sovereign bond yields in sub-Saharan African countries.

In the last column of Table 2, we include a binary variable taking the value of 1 if the country is from the sub-Saharan African region and 0 otherwise. The results show that the coefficient associated with SSA is positive and strongly significant at the 1 percent level, suggesting that the sovereign bond spreads are higher for SSA countries than in the rest of the world. Sub-Saharan African countries are paying higher interest charges than the borrowing costs paid by other countries in the world. Being an African country is associated with an increase of 0.5 percent in sovereign bond spreads.

To further explore this finding, we plot in Figure 2 the difference between the actual and estimated bond spreads for each group, SSA vs non-SSA emerging countries. We also added the group of advanced countries. The estimated bond spreads are based on the results in column (1), Table 2. If actual bond spreads are higher than the estimated bond spreads, then there is a premium perception. Two findings emerge from Figure 2. First, there is a risk premium in both SSA and non-SSA emerging countries, contrary to the group of advanced countries where actual bond spreads are lower than estimated bond spreads. The existence of risk premium is thus not unique to SSA countries. Second, the risk premium is higher for SSA countries than in the rest of other emerging countries, except over the period of the global financial crisis 2007-11. The relative lower effect of the global financial crisis in sub-Saharan Africa than in other emerging countries, combined with the accommodative monetary policy in most advanced countries could explain the significant drop in risk premium for SSA countries during the period 2007-11.

**Figure 2. Difference between actual and estimated bond spreads**



## **b. Risk premium of sub-Saharan African countries: the missing factors**

In Table 2, we followed previous studies and included traditional determinants of sovereign bond yields in the estimates. In this section, we aim to explore whether the risk premium for SSA countries is not due to the exclusion of other important factors that matter for investors. We check whether the risk premium for SSA countries still exists after controlling for the level of transparency of their budget process, the size of the informal sector, the level of development of the financial sector and the regulatory quality. To this end, we include each variable and its interactive with the binary variable SSA in the estimates to check whether its effect on the sovereign bond spreads is specific to SSA countries. The results are presented in Table 3. The baseline results from Table 2 are in column (1)

### **(i) Financial development**

We first check whether the level of development of the local financial sector matters. Domestic financial markets could affect sovereign bonds yields through several channels including the balance-sheet linkages and banks' direct portfolio exposures, for instance foreign asset holdings of banks (Caprio and Honohan, 2008; Caruana and Avdjiev, 2012). More competitive and sophisticated financial systems are less prone to panics or bank runs, and consequently will be associated with superior sovereign credit ratings (Aktug et al., 2013). The size of the financial market, as proxy for bond market liquidity, is expected to affect spreads negatively if investors charge liquidity premia for relatively less liquid bond issuances or bond exchanges. Given the lack of data on market liquidity for many SSA countries, we are using the aggregate financial index from Sahay et al. (2015), which is a comprehensive index encompassing several features of financial institutions and financial markets. We control for the aggregate financial development index in column (2), as well as the interaction with the sub-Saharan African region. The results show that the coefficient associated with the SSA region is no longer significant in column (2), and the interaction variable is also not significant. Therefore, there is no risk premium for SSA countries after taking into account the level of financial sector development. On the other hand, the coefficient associated with the aggregate financial development index is negative and highly significant at the 1 percent level, which is line with expectations that more developed and liquid financial sector are correlated with lower sovereign bond spreads. The potential effect of the financial system on sovereign bond yields is thus not specific to the SSA region.

**(ii) Budget transparency**

We then assess the role of budget transparency. As emphasized by Choi and Hashimoto (2018) and Kemoe and Zhan (2018), budget transparency affects sovereign bond yields. Transparency reduces information asymmetry faced by international investors. Information asymmetry arises in financial markets because borrowing countries know more about their investment projects and fiscal conditions than lenders do. It leads to agency costs because public funds are fungible and investors delegate control over resources to borrowing countries. In this regard, fiscal transparency will reduce uncertainty, thus lowering risk premium demanded by investors (Kemoe and Zhan, 2018). In column (3), Table 3, we include the Open Budget Index and its interactive with the sub-Saharan African region. The results show that the coefficient associated with the binary variable SSA and the interaction term are not significant. Furthermore, the coefficient associated with the open budget index is negative and slightly significant at the 10 percent level, suggesting that countries with high level of fiscal transparency tend to have lower sovereign bond spreads.

**Table 3. The missing factors.**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Economic risk, Log	-0.7126*** (0.231)	-0.6709*** (0.236)	-0.4647** (0.212)	-0.9169*** (0.338)	-0.6373** (0.260)	-0.5143 (0.342)
Financial risk, Log	-1.9545*** (0.313)	-2.0171*** (0.317)	-2.0293*** (0.346)	-2.3190*** (0.347)	-2.0348*** (0.307)	-2.3928*** (0.341)
Political risk, Log	-2.6265*** (0.389)	-2.5223*** (0.412)	-2.1709*** (0.361)	-2.7404*** (0.454)	-1.6311*** (0.471)	-1.2507** (0.507)
US Federal Fund rate	0.1854*** (0.047)	0.1306** (0.054)	0.2099*** (0.058)	0.0588* (0.034)	0.1791*** (0.052)	0.0333 (0.048)
VIX, Log	0.3497*** (0.109)	0.1586** (0.074)	0.3518*** (0.108)	0.5979*** (0.112)	0.3634*** (0.111)	0.5804*** (0.135)
Debt crisis, Lagged	0.2435*** (0.046)	0.2310*** (0.050)	0.2880*** (0.052)	0.2448*** (0.056)	0.1752*** (0.043)	0.2493*** (0.064)
SSA	0.5109*** (0.130)	0.3921 (0.468)	0.0426 (0.435)	-0.6955 (0.727)	-0.1253 (0.245)	-1.8181 (1.325)
Financial development		-1.4030*** (0.469)				-1.4141** (0.565)
Financial development index*SSA		-1.2080 (2.644)				-3.3523 (2.826)
Open budget index			-0.0096* (0.005)			0.0033 (0.003)
Open budget index*SSA			0.0086 (0.009)			0.0492* (0.027)
Informal sector				0.0239*** (0.006)		0.007 (0.006)
Informal sector*SSA				0.0186 (0.019)		-0.0018 (0.015)
Regulatory Quality					-0.6475*** (0.129)	-0.5587*** (0.167)
Regulatory Quality*SSA					-0.5647 (0.352)	-0.4611 (0.300)
Constant	24.3957*** (1.993)	25.2844*** (2.067)	22.5461*** (1.731)	25.9519*** (2.435)	20.4245*** (2.209)	19.7607*** (2.220)
Observations	4,508	4,124	3,674	2,680	4,218	2223
Number of countries	87	85	66	80	87	61
R-squared	0.617	0.7056	0.563	0.7056	0.7181	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### **(iii) Informal sector**

The informal sector poses a challenge to policymakers as well as to investors. The lack of data and information on a sizeable part of the economy (up to 70 percent in some countries including Niger) calls into question the effectiveness of some policies and the quality of official data. The lack of robust, accurate and consistent data is a challenge for international investors when incorporating data and research into the investment decision-making process. IMF (2021) emphasized that macroeconomic models that omit the informal economy systematically misforecast and mismeasure the effect of macroeconomic policies on economic activity. Investors may price in the borrowing costs the uncertainty in the data quality and the potential effects of macroeconomic policies. In addition, informality can lead to lower tax revenue collection and poor economic performance. In column (4), we control for the size of the informal sector and its interaction with the sub-Saharan African region. We find that the coefficient associated with the sub-Saharan African region and the interaction term are not statistically significant. This finding suggests that the risk premium for sub-Saharan African countries identified in Table 2 vanishes when the size of the informal economy is controlled for, and that the effect of the informal sector is not specific to the sub-Saharan African region. In addition, the coefficient associated with the size of the informal sector is positive and strongly significant at the 1 percent level, implying that countries with high level of informal activities tend to have high sovereign bond spreads.

### **(iv) Quality of institutions**

As revealed by Huang, Lin and Yang (2018), Chen and Chen (2019), the quality of the institutions can affect sovereign bond spreads. It is expected that establishing an adequate institutional environment that guarantees the effectiveness of mechanisms and institutions should enhance the sustainability of public finances, reduces uncertainties for international investors and decreases thereafter the sovereign bond spreads. To assess the role of institutions, we use the data on the quality of the regulatory system from the World Bank. The regulatory quality index captures perceptions of the ability of the government to formulate and implement sound policies and regulations. We control for the regulatory quality index and its interaction with the sub-Saharan African region in column (5). The results show that the coefficient associated with the dummy sub-Saharan Africa is no longer significant, as well as the interaction variable. However, the coefficient associated with the regulatory quality index is negative and strongly significant at the 1 percent level, suggesting that countries with good institutions have lower sovereign bond spreads. In the last column, we included the index of financial development, the index of budget transparency, the size of the informal sector and the quality of the regulatory system in the estimates. The results show that the coefficient associated with the SSA region is not statistically significant, suggesting that the premium paid by SSA countries vanishes when these structural factors are all accounted for.

## c. Robustness checks

### (i) Using alternative samples

We check whether our findings are robust to the change of the sample of countries. We first exclude the outlier observations defined as the top and bottom 5 percent observations in column (1), and the top and bottom 10 percent of observations in column (2). This test aims to check if the results are valid when we exclude the countries with the lowest and highest spreads and also the period of low and high spreads based on the economic environment. Second, in column (3), we exclude the two biggest economies in the SSA region, South Africa and Nigeria. Third, we exclude the advanced countries in column (4) to check whether the risk premium of SSA countries still exists if we focus exclusively on emerging economies. The results are presented in Table 4 and those with the interaction variables are in Annexes 1-4. The findings remain uncharmed.

**Table 4: Robustness check: using alternative samples**

VARIABLES	(1)	(2)	(3)	(4)
	Excluding outliers (5%)	Excluding outliers (10%)	Excluding South Africa and Nigeria	Excluding advanced countries
Economic risk, Log	-0.8968*** (0.245)	-0.8310*** (0.263)	-0.7022*** (0.231)	-0.5475*** (0.202)
Financial risk, Log	-1.3462*** (0.279)	-1.3465*** (0.285)	-1.9193*** (0.334)	-1.7942*** (0.277)
Political risk, Log	-2.0974*** (0.299)	-1.9647*** (0.324)	-2.7381*** (0.384)	-2.4779*** (0.410)
US Federal Fund rate	0.1847** (0.094)	0.0894 (0.064)	0.1955*** (0.051)	0.1628*** (0.056)
VIX, Log	0.1344 (0.149)	0.0988 (0.210)	0.3537*** (0.112)	0.3623*** (0.138)
Debt crisis, Lagged	0.2239*** (0.048)	0.2219*** (0.048)	0.2371*** (0.046)	0.2483*** (0.049)
SSA	0.4662*** (0.117)	0.3768*** (0.111)	0.5966*** (0.122)	0.2325** (0.118)
Constant	21.3662*** (1.629)	20.9115*** (1.642)	24.6609*** (2.041)	23.0666*** (1.969)
Observations	4,075	3,616	4,313	3,621
Number of countries	87	85	85	66
R-squared	0.553	0.487	0.646	0.596

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**(ii) Using alternative control variables**

In this section we use alternative macro-fundamental variables. In the baseline estimates, we included some risk indices from ICRG. We now use actual macro-fundamental indicators as in Barajas, Erickson and Steiner (2008). To this end, we control for the budget balance in percentage of GDP, the current account balance in percentage of GDP, total debt in percentage of GDP, the inflation rate, and the level of international reserves in percentage of GDP. The data are from the IMF's World Economic Outlook (WEO). We also include the global factors, i.e., the VIX and the US Federal Fund rate. The results are reported in Table 5. We still find that the coefficient associated with the binary variable SSA is positive and strongly significant at the 1 percent level in column (2) and not statistically significant in columns 3-6. The interaction terms are also not significant except in column (4).

**Table 5: Robustness check: using actual macro-fundamental variables**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP growth	-0.0097** (0.004)	-0.0098** (0.004)	-0.0081** (0.004)	-0.0139* (0.008)	-0.0211*** (0.007)	-0.0172*** (0.004)	-0.0215** (0.009)
Terms of trade	-0.0017 (0.001)	-0.0017 (0.001)	-0.0017 (0.002)	-0.0009 (0.002)	-0.0010 (0.002)	-0.0014 (0.001)	-0.0027 (0.002)
Inflation	0.0302** (0.015)	0.0297** (0.015)	0.0318** (0.014)	0.0522* (0.027)	0.0239 (0.019)	0.0352*** (0.012)	0.0363** (0.017)
Current account balance, in % of GDP	0.0014 (0.008)	0.0014 (0.008)	0.0174* (0.009)	0.0145 (0.017)	0.0140 (0.011)	0.0081 (0.009)	-0.0000 (0.011)
Reserves, in % of GDP	-0.0137** (0.006)	-0.0137** (0.006)	-0.0182*** (0.006)	-0.0131 (0.009)	-0.0165** (0.007)	-0.0072 (0.006)	-0.0187** (0.008)
Debt, in % of GDP, Lagged	0.0230*** (0.004)	0.0231*** (0.004)	0.0276*** (0.005)	0.0270*** (0.005)	0.0240*** (0.004)	0.0212*** (0.003)	0.0318*** (0.006)
Budget balance, in % of GDP	-0.0214 (0.014)	-0.0213 (0.014)	0.0056 (0.011)	-0.0367 (0.023)	-0.0343** (0.016)	-0.0149 (0.017)	0.0206 (0.017)
US Federal Fund rate	0.1921*** (0.040)	0.1924*** (0.040)	0.2104*** (0.049)	0.0984** (0.039)	0.2210*** (0.046)	1.5031*** (0.280)	0.0687** (0.029)
VIX, Log	-2.5946 (2.369)	-2.6380 (2.372)	-1.2340 (2.644)	0.7140*** (0.129)	0.2643*** (0.063)	15.6353*** (3.383)	0.7760*** (0.140)
SSA		1.5033*** (0.384)	0.2787 (0.648)	0.0717 (0.919)	0.1827 (0.465)	0.1494 (0.220)	-1.3976 (1.280)
Open budget index			-0.0372*** (0.012)				0.0068 (0.009)
Open budget index*SSA			0.0172 (0.012)				0.0824 (0.029)
Informal sector				0.0406*** (0.016)			-0.0055 (0.008)
Informal sector*SSA				-0.0412 (0.037)			-0.0127 (0.018)
Financial development index*SSA					1.0968 (1.029)		1.1817 (1.594)
Financial development index					-3.8887*** (1.022)		-3.9699*** (1.141)
Regulatory Quality*SSA						0.6418 (0.464)	-0.1468 (0.825)
Regulatory Quality						-1.0572*** (0.175)	-0.9345*** (0.260)
Constant	10.7178 (6.839)	10.7596 (6.842)	8.8619 (7.592)	0.2061 (0.697)	4.0129*** (0.497)	-47.2178*** (11.032)	3.2670*** (0.786)
Observations	2,969	2,969	2,517	1,383	2,298	2,751	1,189
Number of countries	59	59	49	55	57	59	44
R-squared	0.5499	0.5501	0.5555	0.6038	0.2642	0.2845	0.5696

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

As additional robustness check, we use some risk indices from the Economic Intelligence Unit (EIU). These variables include the currency risk, which measures the risk of a depreciation against a reference currency (usually the US dollar) of 25% or more in nominal terms over the next 12-month period, and the economic structure risk, which is derived from a series of structural macroeconomic variables. We also include the political risk index, which is a composite indicator of a range of factors relating to political stability and effectiveness affecting a country's ability to service its debt obligations or causing turbulence in the foreign-exchange market. The sovereign risk, measuring the probability of a default, is included as well. The results of the estimates are displayed in Table 6. We find that the risk perception of SSA countries still exists even when we use these risk variables from the EIU as the coefficient associated with SSA is significant and positive in column (2). However, it becomes insignificant in columns 3-6 when the interaction terms with the level of open budget index, the size of the informal sector, the level of financial development and the regulatory quality are included. Therefore, the use of alternative control variables to capture strength of macro-fundamentals and risk variables does not change our key findings.

**Table 6. Robustness check: using alternative risk indices**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Currency risk	-2.6512*** (0.676)	-2.6567*** (0.674)	-2.8815*** (0.872)	-1.3302** (0.561)	-2.1991*** (0.501)	-2.0618*** (0.486)	-1.2321** (0.567)
Economic structure risk	-1.9325*** (0.614)	-1.9066*** (0.616)	-1.5544** (0.763)	-3.1887*** (0.746)	-1.8491*** (0.662)	-1.8324*** (0.600)	-2.6144*** (0.686)
Political risk	-0.5825 (0.407)	-0.5609 (0.408)	-0.3372 (0.477)	-1.0190** (0.434)	-0.5457 (0.366)	0.1182 (0.381)	-0.4826 (0.651)
US Federal Fund rate	0.0090 (0.043)	0.0089 (0.043)	-0.0008 (0.049)	0.1168*** (0.024)	0.1723*** (0.045)	3.7534*** (0.336)	0.1274*** (0.022)
VIX, Log	1.9447*** (0.515)	1.9461*** (0.515)	2.0072*** (0.597)	0.6971*** (0.109)	0.5268*** (0.050)	28.1381*** (2.376)	0.6952*** (0.129)
Sovereign risk, Lagged	-0.5610 (0.514)	-0.5600 (0.514)	-0.7070 (0.666)	-0.2786 (0.490)	-0.4701 (0.414)	-0.3803 (0.429)	-0.1227 (0.575)
SSA		0.3138** (0.154)	-0.2030 (0.359)	-0.9986 (0.940)	0.2087 (0.343)	-0.1055 (0.158)	-2.4721 (2.944)
Open budget index			-0.0029 (0.004)				0.0069 (0.006)
Open budget index*SSA			0.0108* (0.006)				0.0292 (0.046)
Informal sector				0.0113** (0.005)			0.0011 (0.005)
Informal sector*SSA				0.0247 (0.020)			0.0518 (0.040)
Financial development index*SSA					0.0026 (1.820)		-2.9033 (3.436)
Financial development index					-0.6428* (0.346)		-0.3553 (0.463)
Regulatory Quality*SSA						-0.1556 (0.205)	1.4506* (0.821)
Regulatory Quality						-0.6330*** (0.108)	-0.4888*** (0.165)
Constant	2.6843* (1.386)	2.6114* (1.381)	2.5581 (1.593)	6.2261*** (0.557)	7.1072*** (0.313)	-84.0189*** (7.764)	5.7591*** (0.576)
Observations	4,224	4,224	3,292	1,751	3,092	3,872	1396
Number of countries	88	88	67	79	84	88	61
R-squared	0.741	0.744	0.716	0.658	0.758	0.771	0.703

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### (iii) Alternative empirical strategy

Finally, we test the robustness of our findings using an alternative empirical strategy. We follow a two-step approach to address the potential confounding issue as the binary variable for the SSA region is time-invariant (Pesaran and Zhou, 2018). In the first step, we run the estimate without time-invariant variables including the dummy for SSA and compute the residuals from this estimate. In the second step, we regress the residuals on the time-invariant variables, including the SSA dummy. The results are presented in Table 7, with the second step results at the bottom of the table. As in the baseline estimate in Table 2, the coefficients associated with our core control variables (economic, financial, and political risks, US Federal Fund rate, VIX and debt crisis) are strongly and statistically significant in all columns with the expected signs. Regarding our variable of interest, we find that the coefficient associated with the SSA region is positive and strongly significant in column (1), which confirms our baseline findings that SSA countries are paying a perception risk premium. In addition, the size of the coefficient associated with the SSA region in column (1) is very close to the one in Table 3, column (1). Table 7 also shows that the coefficients associated with the SSA region is not statistically significant in columns 2-6 as in Table 3, suggesting that the risk premium for SSA countries vanishes when the level of financial sector development, the transparency of the budget process, the size of the informal sector and the quality of institutions are considered into the estimates. This result is in line with our baseline findings.

**Table 7. Robustness check: using alternative empirical method**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
<i>First step</i>						
Economic risk, Log	-0.7149*** (0.231)	-0.4645** (0.212)	-0.9026*** (0.336)	-0.6685*** (0.237)	-0.6380** (0.260)	-0.5154 (0.337)
Financial risk, Log	-1.9522*** (0.313)	-2.0295*** (0.346)	-2.3384*** (0.347)	-2.0193*** (0.318)	-2.0357*** (0.307)	-2.3894*** (0.342)
Political risk, Log	-2.6734*** (0.388)	-2.1696*** (0.362)	-2.7244*** (0.444)	-2.5353*** (0.417)	-1.6297*** (0.472)	-1.2699** (0.506)
US Federal Fund rate	0.1859*** (0.047)	0.2099*** (0.058)	0.0604* (0.034)	0.1321** (0.054)	0.1789*** (0.052)	0.0374 (0.046)
VIX, Log	0.3490*** (0.109)	0.3518*** (0.108)	0.5959*** (0.112)	0.1563** (0.074)	0.3635*** (0.111)	0.5801*** (0.134)
Debt crisis, Lagged	0.2446*** (0.046)	0.2879*** (0.052)	0.2419*** (0.056)	0.2315*** (0.050)	0.1755*** (0.043)	0.2458*** (0.063)
Open budget index		-0.0097* (0.005)				0.004 (0.003)
Open budget index*SSA		0.0094*** (0.003)				0.0320** (0.014)
Informal sector			0.0252*** (0.006)			0.0079 (0.006)
Informal sector*SSA			0.0043 (0.006)			-0.0035 (0.005)
Financial development index*SSA				-0.5775 (1.802)		-3.7706 (3.001)
Financial development				-1.5255*** (0.431)		-1.3424** (0.570)
Regulatory Quality					-0.6445*** (0.129)	-0.5632*** (0.167)
Regulatory Quality*SSA					-0.4075 (0.307)	-0.392 (0.273)
<i>Second step</i>						
SSA	0.5023*** (0.128)	0.0055 (0.142)	-0.1279 (0.203)	0.241 (0.217)	-0.1059 (0.161)	-0.0635 (0.164)
Constant	24.6688*** (1.999)	22.5467*** (1.726)	25.8560*** (2.398)	25.4313*** (2.109)	20.4085*** (2.208)	19.7269*** (2.221)
Observations	4,508	3,674	2,680	4,124	4,218	2,223
Number of countries	87	66	80	85	87	61
R-squared	0.6289	0.563	0.6093	0.7155	0.7183	0.7422

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## VI. Conclusion

There is an increasing concern about the access of sub-Saharan Africa countries to international financial markets. Despite the strong increase in Eurobonds issuances since 2006, several claims have been made by policymakers in the region on the perceived risk perception premium and high borrowing costs. In this paper, we provided an empirical analysis of this perceived risk premium both in the primary and secondary markets. Using a large and rich dataset of nearly 1600 international primary sovereign fixed coupon bonds issued between 2003-2011 by 89 countries, we uncovered some heterogeneities in borrowing costs across regions, and found that SSA countries pay significantly higher coupon at issuance compared to their peers from other regions even after controlling for their risk rating at issuance. We then supplemented this analysis by exploring whether this bias against SSA countries also exists in the secondary market in terms of refinancing costs. Based on a panel of quarterly data covering 107 countries over 1990 – 2022 and controlling for traditional country-specific fundamentals and global factors, we found that SSA countries pay higher refinancing costs in the secondary market.

The paper further explored whether the sub-Saharan Africa premium identified when using traditional specifications is due to other factors overlooked in the literature that matter for the risk pricing by international investors. We augmented the traditional models by including four structural factors where SSA countries face acute challenges such as the level of development of the financial sector, the transparency of budget process, the size of the informal sector, and the quality of the regulatory system. We found that the high premium estimated for SSA countries fades away when these structural factors are accounted for in the regressions. The results suggest that the perceived risk premium estimated in traditional models is driven by empirical misspecifications and the lack of consideration of some structural factors that are key to international investors.

The results of this paper suggest that the perceived risk premium for SSA countries recently highlighted by policymakers and some analysts is actually driven by structural challenges facing SSA countries. From the perspective of policymaking, this reinforces the call for SSA countries to implement structural reforms, including to develop and deepen the liquidity of domestic financial markets, improve the transparency of budget process, strengthen the quality of public institutions, create a business environment conducive for the development of the private sector and reduce informality, to unlock sustainable financing at the lowest possible cost to meet large development needs. Meeting these structural challenges could be a game changer for sub-Saharan African countries by lowering their borrowing costs.

**Annex 1. Robustness check: excluding outliers (5 percent of observations)**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Economic risk, Log	-0.8968*** (0.245)	-0.5930*** (0.186)	-1.0671*** (0.285)	-0.8630*** (0.253)	-0.9471*** (0.250)	-0.7986*** (0.274)
Financial risk, Log	-1.3462*** (0.279)	-1.5393*** (0.294)	-1.7415*** (0.332)	-1.4369*** (0.298)	-1.3888*** (0.247)	-1.9079*** (0.333)
Political risk, Log	-2.0974*** (0.299)	-1.9075*** (0.336)	-2.0758*** (0.344)	-2.0422*** (0.312)	-1.4131*** (0.386)	-1.3801*** (0.452)
US Federal Fund rate	0.1847** (0.094)	0.1688* (0.099)	0.0808** (0.033)	0.1515** (0.060)	0.1696*** (0.055)	0.0508 (0.047)
VIX, Log	0.1344 (0.149)	0.2504 (0.173)	0.5926*** (0.111)	0.2069** (0.093)	0.1475 (0.147)	0.6208*** (0.123)
Debt crisis, Lagged	0.2239*** (0.048)	0.2687*** (0.054)	0.2089*** (0.055)	0.2106*** (0.050)	0.1620*** (0.045)	0.2346*** (0.059)
SSA	0.4662*** (0.117)	0.1979 (0.429)	-0.6735 (0.788)	0.2718 (0.400)	0.0280 (0.162)	-2.6496 (2.006)
Open budget index		-0.0058 (0.004)				0.0026 (0.003)
Open budget index*SSA		0.0043 (0.008)				0.0482 (0.034)
Informal sector			0.0229*** (0.006)			0.0107 (0.007)
Informal sector*SSA			0.0173 (0.015)			0.0146 (0.021)
Financial development index*SSA				-0.0124 (2.009)		-2.1322 (2.281)
Financial development				-0.8006 (0.490)		-0.7851 (0.527)
Regulatory Quality					-0.5167*** (0.087)	-0.3616*** (0.121)
Regulatory Quality*SSA					-0.2647 (0.177)	-0.5478** (0.242)
Constant	21.3662*** (1.629)	20.2930*** (1.718)	21.7027*** (1.989)	21.4586*** (1.728)	18.9440*** (1.846)	19.1036*** (2.376)
Observations	4,075	3,328	2,445	3,741	3,828	2,050
Number of countries	87	66	80	85	87	61
R-squared	0.5529	0.4868	0.5146	0.6301	0.676	0.6692

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Annex 2: Robustness check: excluding outliers (10 percent of observations)**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Economic risk, Log	-0.8310*** (0.263)	-0.5868*** (0.200)	-0.9859*** (0.308)	-0.7951*** (0.276)	-0.8696*** (0.260)	-0.6754** (0.283)
Financial risk, Log	-1.3465*** (0.285)	-1.4986*** (0.281)	-1.7095*** (0.331)	-1.4206*** (0.304)	-1.4236*** (0.259)	-1.9259*** (0.319)
Political risk, Log	-1.9647*** (0.324)	-1.9582*** (0.331)	-1.9360*** (0.328)	-1.8855*** (0.345)	-1.3228*** (0.416)	-1.1121** (0.4733)
US Federal Fund rate	0.0894 (0.064)	0.0893 (0.063)	0.0748 (0.047)	0.0938 (0.088)	0.1190** (0.058)	0.0352 (0.057)
VIX, Log	0.0988 (0.210)	0.2564 (0.198)	0.5976*** (0.103)	0.1921* (0.112)	0.1239 (0.201)	0.5937*** (0.125)
Debt crisis, Lagged	0.2219*** (0.048)	0.2930*** (0.048)	0.2148*** (0.055)	0.2074*** (0.051)	0.1675*** (0.046)	0.2466*** (0.060)
SSA	0.3768*** (0.111)	0.2924 (0.427)	-0.3295 (0.545)	0.1751 (0.351)	0.0120 (0.148)	-2.4903 (2.011)
Open budget index		0.0000 (0.003)				-0.0043* (0.002)
Open budget index*SSA		0.0001 (0.008)				0.0429 (0.033)
Informal sector			0.0199*** (0.004)			0.0095* (0.005)
Informal sector*SSA			0.0081 (0.010)			0.0172 (0.022)
Financial development index*SSA				0.1661 (1.721)		-1.9781 (2.161)
Financial development				-0.7504 (0.489)		-0.6726 (0.479)
Regulatory Quality					-0.4803*** (0.083)	-0.3961*** (0.123)
Regulatory Quality*SSA					-0.2281 (0.171)	-0.4257 (0.227)
Constant	20.9115*** (1.642)	20.1724*** (1.478)	20.8438*** (1.888)	20.7793*** (1.928)	18.6749*** (1.870)	17.6292*** (2.502)
Observations	3,616	3,051	2,241	3,352	3,412	1,900
Number of countries	85	64	78	83	85	59
R-squared	0.487	0.492	0.477	0.551	0.577	0.628

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Annex 3. Robustness check: excluding South Africa and Nigeria**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Economic risk, Log	-0.7022*** (0.231)	-0.4572** (0.220)	-1.0572*** (0.338)	-0.6985*** (0.237)	-0.6466** (0.261)	-0.6609** (0.324)
Financial risk, Log	-1.9193*** (0.334)	-1.9783*** (0.373)	-2.2041*** (0.360)	-1.9389*** (0.336)	-2.0458*** (0.331)	-2.3620*** (0.381)
Political risk, Log	-2.7381*** (0.384)	-2.3020*** (0.365)	-2.7843*** (0.461)	-2.5378*** (0.397)	-1.6705*** (0.462)	-1.1728** (0.574)
US Federal Fund rate	0.1955*** (0.051)	0.2286*** (0.062)	0.0715** (0.036)	0.1471*** (0.054)	0.2088*** (0.053)	0.0701* (0.039)
VIX, Log	0.3537*** (0.112)	0.3600*** (0.112)	0.5960*** (0.114)	0.1431* (0.076)	0.3746*** (0.114)	0.5646*** (0.139)
Debt crisis, Lagged	0.2371*** (0.046)	0.2818*** (0.052)	0.2184*** (0.049)	0.2201*** (0.049)	0.1755*** (0.043)	0.2218*** (0.061)
SSA	0.5966*** (0.122)	0.1814 (0.417)	-1.5083 (1.218)	0.6013 (0.765)	-0.2891 (0.247)	-1.2205 (1.205)
Open budget index		-0.0088 (0.005)				0.0037 (0.003)
Open budget index*SSA		0.0080 (0.009)				0.0426** (0.016)
Informal sector			0.0243*** (0.006)			0.0061 (0.006)
Informal sector*SSA			0.0434 (0.031)			0.0197 (0.018)
Financial development index*SSA				-2.9147 (5.081)		1.7247 (1.641)
Financial development				-1.6265*** (0.455)		-1.5199*** (0.575)
Regulatory Quality					-0.6389*** (0.135)	-0.5664*** (0.182)
Regulatory Quality*SSA					-0.9475*** (0.354)	-0.2808 (0.375)
Constant	24.6609*** (2.041)	22.7793*** (1.836)	26.2132*** (2.494)	25.2518*** (2.010)	20.5895*** (2.159)	19.9269*** (2.303)
Observations	4,313	3,479	2,552	3,936	4,055	2,095
Number of countries	85	64	78	83	85	59
R-squared	0.646	0.587	0.664	0.734	0.745	0.760

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Annex 4. Robustness check: excluding advanced economies**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Economic risk, Log	-0.5475*** (0.202)	-0.5287** (0.221)	-0.6589** (0.298)	-0.5128** (0.210)	-0.5053*** (0.196)	-0.5155 (0.325)
Financial risk, Log	-1.7942*** (0.277)	-1.7644*** (0.307)	-1.9528*** (0.336)	-1.8405*** (0.289)	-1.8399*** (0.252)	-2.0171*** (0.317)
Political risk, Log	-2.4779*** (0.410)	-2.2030*** (0.380)	-2.5228*** (0.488)	-2.5029*** (0.417)	-1.8152*** (0.455)	-1.4603*** (0.420)
US Federal Fund rate	0.1628*** (0.056)	0.2230*** (0.068)	0.0738** (0.031)	0.1738*** (0.055)	0.1458** (0.058)	0.0613 (0.041)
VIX, Log	0.3623*** (0.138)	0.4160*** (0.149)	0.7476*** (0.139)	0.4199*** (0.095)	0.3614** (0.140)	0.6691*** (0.149)
Debt crisis, Lagged	0.2483*** (0.049)	0.2867*** (0.053)	0.2307*** (0.058)	0.2362*** (0.050)	0.1826*** (0.048)	0.2388*** (0.062)
SSA	0.2325** (0.118)	0.5661 (0.421)	-1.1155 (0.641)	0.4460 (0.505)	-0.2353 (0.209)	-0.6932 (1.448)
Open budget index		0.0055* (0.003)				0.0029 (0.002)
Open budget index*SSA		-0.0068 (0.008)				0.0311 (0.026)
Informal sector			0.0147** (0.006)			0.0035 (0.005)
Informal sector*SSA			0.0273* (0.016)			-0.0071 (0.017)
Financial development index*SSA				-1.5689 (2.801)		-3.1434 (2.413)
Financial development				-0.3554 (0.571)		-0.6208 (0.544)
Regulatory Quality					-0.4420*** (0.103)	-0.4518*** (0.119)
Regulatory Quality*SSA					-0.7188*** (0.278)	-0.4404* (0.225)
Constant	23.0666*** (1.969)	21.2504*** (1.770)	22.9053*** (2.236)	23.0699*** (1.987)	20.3341*** (2.101)	18.6397*** (2.026)
Observations	3,621	3,201	2,276	3,384	3,331	2,003
Number of countries	66	55	59	64	66	50
R-squared	0.596	0.603	0.517	0.612	0.604	0.724

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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