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MODERATING ANALYSIS OF FINANCIAL POLICY, REAL INTEREST RATE AND ECONOMIC PERFORMANCE IN MIDDLE EAST & NORTH AFRICA AND SUB-SAHARAN AFRICA COUNTRIES

ANALIZA MODERACYJNA POLITYKI FINANSOWEJ, REALNEJ STOPY PROCENTOWEJ I WYNIKÓW GOSPODARCZYCH W KRAJACH BLISKIEGO WSCHODU I AFRYKI PÓŁNOCNEJ ORAZ AFRYKI SUBSAHARYJSKIEJ

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Abstract

Subject and purpose of work: This study investigates the interplay between financial policy and real interest rates and their impact on economic performance in MENA and SSA countries. It aims to determine whether financial policy supports economic performance and how its interaction with real interest rates amplifies or moderates its effect.

Materials and methods: The research applies both static (Pooled OLS and Fixed Effects) and dynamic systems GMM estimation techniques on a panel dataset of 70 countries across 21 years (2000-2020).

Results: Results indicate that domestic credit to the private sector by banks positively contributes to economic performance, with real interest rates intensifying this effect. However, real interest rates, when combined with domestic credit, show both positive and negative net effects on economic performance, especially in financially constrained economies with low and negative real interest rates.

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Conclusions: Notably, thresholds for real interest rates–such as 5.5%–are identified, above which the net impact on economic performance can shift from negative to positive.

Keywords: Sub-Saharan Africa, financial policy, economic performance, real interest rate, Middle East & North Africa

Streszczenie

Przedmiot i cel pracy: Niniejszy artykuł bada wzajemne oddziaływanie polityki finansowej i realnych stóp procentowych oraz ich wpływ na wyniki gospodarcze w krajach MENA i SSA. Jego celem jest ustalenie, czy polityka finansowa wspiera wyniki gospodarcze i w jaki sposób jej interakcja z realnymi stopami procentowymi wzmacnia lub łagodzi jej wpływ.

Materiały i metody: W badaniu zastosowano zarówno statyczne (Pooled OLS i Fixed Effects), jak i dynamiczne techniki estymacji GMM na zbiorze danych panelowych obejmującym 70 krajów w ciągu 21 lat (2000-2020).

Wyniki: Wyniki wskazują, że krajowe kredyty dla sektora prywatnego udzielane przez banki pozytywnie wpływają na wyniki gospodarcze, a realne stopy procentowe wzmacniają ten efekt. Jednak realne stopy procentowe w połączeniu z kredytem krajowym, wykazują zarówno pozytywny, jak i negatywny wpływ netto na wyniki gospodarcze, zwłaszcza w gospodarkach o ograniczonych możliwościach finansowych z niskimi i ujemnymi realnymi stopami procentowymi.

Wnioski: W szczególności zidentyfikowano progi dla realnych stóp procentowych – takie jak 5,5% – powyżej których wpływ netto na wyniki gospodarcze może zmienić się z negatywnego na pozytywny.

Słowa kluczowe: Afryka Subsaharyjska, polityka finansowa, wyniki gospodarcze, realna stopa procentowa, Bliski Wschód i Afryka Północna

Introduction

Financial policies were a key component of South Korea's, Taiwan's, and China's strategic goals for achieving competitive success (Wade, 1991; Amsden, 1989). These included interest rate differentials and bank aid for private investment, which came from corporate money that flows via a heavily regulated banking sector. Economists have long been concerned about the financial system's impact on macroeconomic performance. According to Montiel (1995), in developing nations, the issue of financial policy is typically discussed in the context of "financial repression," which refers to the web of legislative limitations that the banking sector has traditionally functioned under. McKinnon (1973) and Shaw (1973) pioneered the literature on financial repression by calling for the elimination of many of these constraints, known as financial liberalization, as a growth-enhancing policy in developing countries. While this policy prescription sparked much debate at first, many developing countries have already updated their policies in the same way.

Unfortunately, a new wave of study has focused on the conditions under which financial policies are most likely to have an impact on economic performance. Overall, this new literature emphasizes the importance of macroeconomic stability, as well as robust financial regulation and monitoring skills. This literature has investigated and expanded on the ideas previously articulated by McKinnon and Shaw, while contextualizing the entire topic within a new perspective on the growth process. Its empirical contributions investigated the relationship between financial policies and economic performance in a variety of scenarios, including both industrialized and developing countries. The McKinnon-Shaw hypothesis holds that the degree of financial policy should be firmly linked to the current level of the real interest rate, because the real interest rate, when kept below its usual competitive levels, reveals the scope of financial policy. Similarly, Fry (1988) argued that a positive real interest rate promotes financial policy by increasing the supply of credit to the private sector. This in turn improves financial performance. Previous studies (Galor and Zeira 1993; Rajan and Zingales, 2003; Roubini and Sala-i-Martin, 1992; Levine, 1991; Agarwala, 1983; Gelb, 1988; De Gregorio, and Guidotti, 1995) studied the tripartite relationship between financial policy, real interest rates, and economic performance using a range of techniques and measurements. We consider analogous circumstances. Furthermore, a thorough relationship between financial policy, real interest rates, and economic performance will be assessed using descriptive and econometric technique. To investigate the debate, a panel data set of 70 nations (N) from MENA and SSA is examined over 21 years (T), with five variables – GDP growth, domestic credit to the private sector, domestic credit to the private sector by banks, real interest rate, and bank liquid reserves to bank assets ratio – spanning 2000 to 2020. The starting year of 2000 was chosen because most nations have had data on GDP growth (a proxy for economic performance) since mid-2000, and the cut-off year of 2020 was chosen since most countries' domestic credit statistics (a proxy for financial policy) ended in 2020. Following De Gregorio and Guidotti (1995), Giovanninni and De Melo (1993), and Chamley and Honohan (1990), we use GDP growth as an indicator of economic performance. Furthermore, static, and dynamic models are used to address problems about financial policy, real interest rates, and economic performance, drawing on current research techniques (De Gregorio, 1992; King and Levine, 1993; Roubini and Sala-i-Martin, 1992; Gelb, 1988). The outcomes of this study offer a new perspective on how to discuss financial policies in both regions. It also presents governments in the countries under review with new and practical policy options to explore.

To attain the study's objective of establishing if financial policy supports economic performance and whether its interaction with real interest rates strengthens its influence on economic performance, a multidimensional method is used, with estimates performed first on (i) the full sample of 70 nations, (ii) income categories, and (iii) region-specific sub-samples. This strategy broadens the scope of the study while also ensuring a comprehensive consideration of its main argument. The rest of the paper is organized as follows: Section 2 examines the literature; Section 3 gives some stylized facts; Section 4 covers the data and the empirical model; Section 5 summarizes the findings; and Section 6 concludes.

Literature review

Divergent scientific theories have provided opposing explanations for how financial policy and economic performance are linked. Some believe that the emergence of financial intermediaries, or proxy financial policies, will disproportionately benefit the poor (Levine 2004). Banerjee and Newman (1993), Galor and Zeira (1993), and Aghion and Bolton (1997) all identify domestic credit as a financial policy component that effects economic performance. According to their results, informational asymmetries lead to credit limits that disproportionately affect the poor, who lack the funds for independent projects, as well as the political contacts and collateral required to receive bank loans. As a result, the poor are unable to take advantage of investment opportunities due to credit constraints. While credit limits may stifle aggregate development by preventing capital from being channelled to its highest value use, a dysfunctional financial system would also worsen income inequality by preventing capital from reaching "wealth-deficient" business. On a broader level, numerous political economy theories contend that better functioning financial institutions make financial services more accessible to the general public, rather than constraining capital to entrenched incumbents (Haber, Maurer, and Razo, 2003; Rajan and Zingales, 2003; Morck, Wolfenzon, Yeung, 2005). Thus, by lowering lending limits, financial development can promote entrepreneurship, new business formation, and economic growth. Some claim that changes to financial rules disproportionately benefit the wealthy and politically connected. Domestic credit is restricted to the wealthy and well-connected, particularly in the early stages of economic development (Lamoreaux, 1995; Haber, 1991, 2004a, b). Under these conditions, tougher financial laws may only serve to steer more wealth to a select few. Thus, it is unclear if access to domestic credit (financial policy) improves aggregate growth (economic performance).

According to Roubini and Sala-i-Martin (1992), various development economists have argued financial strategies for a variety of reasons, but standard literature responses are not wholly satisfactory. They argued that the government should introduce anti-usury legislation, interfering with the free fixing of real interest rates. They also say that financial policies were found with actual interest rates lower than market rates, reducing the costs of servicing government debt. According to the empirical research on financial policy, they are associated with negative real interest rates (Roubini and Sala-i-Martin, 1992; Levine, 1991). However, they demonstrate that economically depressed economies are characterized by credit rationing and artificially low real interest rates. Governments in financially constrained economies sometimes keep deposit and lending rates below inflation, resulting in low and/or negative real interest rates. Agarwala (1983) and Gelb (1988) employ thirty developing countries to give strong evidence of a negative relationship between financial policies and real interest rates, proving that the simple bivariate relationship between interest rates and economic performance is negative. They conclude that low real interest rates lead to poor economic performance is positively correlated with real interest rate levels. According to Fry (1988) and De Gregorio and Guidotti (1995), a positive real interest rate boosts financial savings by boosting bank

credit availability to the private sector, hence increasing investment and growth. While the McKinnon-Shaw hypothesis recognized that positive real interest rates make the allocation of asset based money more efficient, this had an even greater positive impact on economic performance. According to Montiel (1995), the government uses financial policies to take resources by borrowing from banks at below-market rates, setting real interest rate restrictions, and coopting resources through unpaid reserve requirements. Giovanninni and De Melo (1993) conducted argumentation studies for a vast number of countries, while Chamley and Honohan (1990) studied five Sub-Saharan African countries and Ikhide (1992) for eight of them. While previous studies have examined the economic impact of financial policy, little is known about the relationship between financial policy, real interest rates, and economic performance. Most prior research, including works by McKinnon (1973), Shaw (1973), Fry (1988), and De Gregorio and Guidotti (1995), focused either on industrialized nations or broad cross-country comparisons, without a dedicated emphasis on MENA and SSA economies. These regions have unique economic structures, financial regulations, and challenges that were not adequately addressed. Moreover, existing studies did not provide policymakers with specific real interest rate thresholds that optimize the impact of financial policy on economic growth. This study fills a critical gap by offering a more nuanced, region-specific analysis of the interaction between financial policy, real interest rates, and economic growth. It provides policymakers with clear thresholds, empirical insights, and a structured methodology previously missing in the literature.

Some stylized facts

This section delves into some comparative statistics based on the study's major variables - GDP growth (a proxy for economic performance), domestic bank credit to the private sector, and real interest rates - to illustrate the trend analysis across time across geographic regions. The descriptive analysis includes thorough information on the pattern of financial policy, real interest rates, and economic performance in MENA and SSA countries from 2000 to 2020 (see Appendix for a list).

Domestic Product

Figure 1 illustrates yearly aggregate income growth estimates for MENA and SSA nations over a 21year period, which can be thought of as episodic, with some periods exhibiting declining trends and others showing growing trends. Between 2000 and 2007, MENA economies experienced moderate GDP growth rates of approximately 5.8%, 1.5%, 1.8%, 4.1%, 9.4%, 5.7%, 6.1%, and 5.9%. During the same period, the aggregate income of SSA countries increased by around 3.0%, 5.1%, 4.3%, 3.1%, 5.9%, 5.3%, 5.6%, and 5.5% annually. By 2008, the world has experienced its most severe economic crisis since the Great Depression. Beginning in 2010, a rebound was noticed as western economies tried to recover from the 2008/2009 global depression. In 2011, MENA nations dipped to 0.8% from 5.3% in 2010, while SSA countries fell somewhat to 4.8% from 5.7% in 2010. However, in 2012, MENA nations saw a 10% margin growth, which plummeted to 3.2% the following year. From 2014 to 2019, the regions had both decreasing and increasing trends. By 2020, GDP growth in the areas will have passed the negative threshold, with SSA nations falling 1.9% and MENA countries falling 6.5%. Beyond this time-frame, annual income growth in these two zones has been very steady.



Figure 1. Trend of GDP growth for MENA and SSA Countries (2000-2020) Source: Authors' compilation.

Domestic credit to private sector by banks



Figure 2. Trend of domestic credit to private sector (DCPSB) for MENA and SSA Countries (2000-2020) Source: Authors' compilation.

The trend of domestic bank credit to the private sector in MENA and SSA countries. Domestic credit to the private sector by banks (DCPSB) in MENA nations is substantially higher than in SSA countries, meaning

that financial resources provided to the private sector by other depository corporations, such as loans, purchases of non-equity securities, trade credits, and other accounts receivable that establish a claim for repayment, are greater in the Middle East and North Africa than in Sub-Saharan Africa. Because domestic credit to the private sector by banks can be used to measure financial policy (De Gregorio and Guidotti, 1995; Chandrasekhar, 2006), the graphical depiction indicates that MENA has a higher level of domestic credit to the private sector by banks than SSA. Between 2015 and 2020, MENA banks issued domestic credit to the private sector at rates of around 57.9%, 60%, 58.3%, 54.2%, 56.1%, and 64.9%. Domestic credit percentages in SSA countries during the same period were around 22.4%, 21.9%, 21.1%, 21.6%, and 25.4%, respectively.

Real interest rate

The real interest rate is the loan interest rate adjusted for inflation, calculated using the GDP deflator. Better real interest rates (RIR) can boost savings returns while increasing borrowing costs, reducing profitability. Lower real interest rates (RIR) can, however, boost investment in capital goods, resulting in increased productivity and improved economic performance. During the study period, SSA countries had higher real interest rates (RIR) than MENA.



Figure 3. Trend of real interest rate (RIR) for MENA and SSA Countries (2000-2020) Source: Authors' compilation.

For example, in 2004, 2005, and 2006, MENA's real interest rate (RIR) fell to -0.5%, -4.1%, and -0.3%, whereas SSA countries experienced 6.1%, 7.8%, and 7.4%, respectively. After the same period, real interest rates in MENA and SSA countries fell while others rose (See figure 3). This is expected to show that Sub-Saharan African countries face greater economic volatility and development challenges than many MENA countries. These include insufficient institutional frameworks, political instability, a scarcity of infrastructure, and governance issues. Another factor is that SSA countries' financial systems are underdeveloped in comparison to MENA countries, with limited access to money and high transaction costs.

Data and model

Data

The sample includes 70 MENA and SSA countries from 2000 to 2020. In consistent with earlier research, the analysis includes five variables: GDP growth (a proxy for economic performance), domestic credit to the private sector by banks (a proxy for financial policy), real interest rate, and bank liquid reserves to bank assets ratio. The dependent variable is economic performance; the key explanatory variables are domestic credit to the private sector, domestic credit to the private sector by banks, and real interest rates; and the control variable is the bank liquid reserve-to-asset ratio. Table 1 shows the variable descriptions and sources.

Table 1. Variables description and sources

Variable	Description	Sources
GDPgrth	Gross domestic product growth (annual %) proxy for economic performance	World Bank 2021 (WDI)
DCPFS	Domestic credit provided by financial sector (% of GDP)	World Bank 2021 (WDI)
DCPS	Domestic credit to private sector (% of GDP)	World Bank 2021 (WDI)
DCPSB	Domestic credit to private sector by banks (% of GDP)	World Bank 2021 (WDI)
RIR	Real interest rate (%)	World Bank 2021 (WDI)
BLR	Bank liquid reserves to bank assets ratio (%)	World Bank 2021 (WDI)

Source: Authors' compilation from World Development Indicators (WDI).

Summary statistics and correlation analysis

Table 2 illustrates the relative statistics for these indicators, whereas Table 3 shows the correlation analysis. Table 2's determinants are explored using the full sample, regional and income groups, with a focus on the three variables of interest, GDP growth, domestic credit provided by the financial sector, and real interest rate. The sample average for GDP growth is 3.90%, with a standard deviation of 6.95, indicating a wide variation from the sample mean. Libya in North Africa (upper middle income, MENA) experienced the weakest growth rate of -62.07% in 2011 but the fastest growth rate of 123.14% in 2012. Libya's GDP growth rate fluctuated substantially between 2011 and 2012, owing mostly to the political and societal upheaval known as the Libyan Civil War. The civil war resulted in widespread violence, instability, and economic destruction throughout the country. This instability caused a sharp drop in economic activity, bringing the GDP growth rate to -62.07%. Libya began to recover and stabilize in 2012, when the civil war finished and the Gaddafi regime was deposed. This resulted in a significant boost in economic activity as the economy recovered from last year's drop. In terms of financial policy, South Africa (upper middleincome, SSA) received the greatest domestic credit from the financial industry in 2007, valued at US\$ 192.66, while the Comoros (low income income, SSA) received the least, valued at US\$ 5.02 in 2004. The standard deviation of 55.04 indicates that the countries deviate from the sample average of US\$ 75.38. Furthermore, the average real interest rate is 6.76%, with the lowest at -74.18% in Zimbabwe (lower middle income, SSA) in 2019 and the highest at 61.88% in South Sudan (lower income, SSA) in 2014. The average bank liquid reserves to bank assets ratio is 24.44%, with a standard deviation of 28.97%, indicating that countries are distributed around the mean. South Sudan (low-income, SSA) had the highest bank liquid reserves to bank assets ratio of 390.11% in 2016, while Djibouti had the lowest at 1.13% in 2005. The correlation research in Table 3 demonstrates that domestic credit to the private sector, domestic credit to the private sector by banks, and the ratio of bank liquid reserves to bank assets all have a negative association with GDP growth, whereas real interest rates are positively associated with economic performance. Connections between regressors do not suggest multicollinearity because all correlation coefficients are less than 0.75. It is important to emphasize that the observed interactions are insufficient to infer conclusions about the regressors' influence on the outcome variable, necessitating rigorous empirical testing of the relationships.

Groups	Statistics	GDPgrth	DCPFS	DCPS	DCPSB	RIR	BLR
	Mean	3.9158	75.3885	28.3262	26.9021	6.7630	24.4440
	Std. Dev	6.9582	55.0430	28.4123	24.3754	11.4188	28.97921
Full Sample	Minimum	-62.0759	5.02913	0	0	-74.1819	1.1370
	Maximum	123.14	192.66	160.125	136.564	61.8826	390.11
	Mean	3.6759	89.3522	47.9467	46.4797	3.6443	22.4537
MENA	Std. Dev	9.2559	25.8416	28.9151	26.8974	11.1501	29.5038
MENA	Minimum	-62.0759	51.7824	1.26693	1.26603	-20.129	1.13702
	Maximum	123.14	141.174	136.996	136.564	60.8767	188.947
	Mean	4.0221	67.6309	19.9175	18.2032	7.9777	25.0875
66 A	Std. Dev	5.6516	64.7770	23.6620	17.0642	11.2994	28.7960
SSA	Minimum	-46.0821	5.0291	0	0	-74.1819	1.6383
	Maximum	63.3799	192.66	160.125	106.26	61.8826	390.11
	Mean	4.0096	99.1578	56.6121	56.4272	3.5103	12.1534
TT- 1 T	Std. Dev	4.9477	8.1082	25.5591	24.7113	11.5248	6.5224
High Income	Minimum	-10.7205	90.3796	16.553	16.553	-20.129	2.7043
	Maximum	26.1702	109.198	136.996	136.564	43.3426	34.7149
	Mean	3.7753	125.0307	51.6512	43.1026	5.5966	31.2879
	Std. Dev	12.6454	48.8078	42.8388	30.5781	9.4135	38.6888
Upper Mid-Income	Minimum	-62.0759	51.7824	1.2669	1.2660	-17.4565	1.7555
	Maximum	123.14	192.66	160.125	106.26	60.8767	188.947
	Mean	3.7493	62.0586	24.3798	23.2738	5.2847	23.9552
T NC-1 T	Std. Dev	4.4633	44.1201	18.7842	16.7431	9.8427	19.7758
Lower Mid-Income	Minimum	-17.6689	5.0291	2.0104	1.9665	-74.1819	1.1370
	Maximum	21.9252	164.559	95.5065	84.0523	38.9759	125.716
	Mean	4.1275	25.0691	11.5959	11.3528	10.4281	25.9872
	Std. Dev	5.8547	14.5265	7.4461	7.2727	13.0919	36.0766
Low Income	Minimum	-46.0821	11.0231	0	0	-34.462	1.6383
	Maximum	33.6294	49.451	40.163	40.0559	61.8826	390.11
GDPgrth = Gross domestic product growth; DCPFS = Domestic credit provided by financial sector; DCPS = Domestic credit to							

Table 2. Summary statistics

GDPgrth = Gross domestic product growth; DCPFS = Domestic credit provided by financial sector; DCPS = Domestic credit to private sector; DCPSB = Domestic credit to private sector by banks; RIR = Real interest rate; BLR = Bank liquid reserves to bank assets ratio; MENA = Middle East & North Africa; SSA = Sub-Saharan Africa

Source: Authors' computation.

Table 3. Correlation analysis

Variables	GDPgrth	DCPS	DCPSB	RIR	BLR	
GDPgrth	1.0000					
DCPS	-0.0815***	1.0000				
DCPSB	-0.0956***	0.0953***	1.0000			
RIR	0.0238	-0.0791**	-0.0743**	1.0000		
BLR	-0.0215	-0.2889***	-0.3079***	0.0142	1.0000	
Note: *** p<0.01; ** p<0.05; * p<0.1; GDPgrth = Gross domestic product growth; DCPS = Domestic credit to private sector;						

DCPSB = Domestic credit to private sector by banks; RIR = Real interest rate; BLR = Bank liquid reserves to bank assets ratio.

Source: Authors' computation.

Empirical model

According to the existing literature, financial policies are an important part of governments' strategic plans (Wade, 1991; Amsden, 1989). However, Roubini and Sala-i-Martin (1992) and Levine (1991) claimed that financially repressed countries have credit rationing and artificially low real interest rates, meaning that financial policies have an inverse relationship with real interest rates. Some research found strong evidence of a negative association between real interest rates and economic performance (Agarwala, 1983; Gelb, 1988). Finance and Growth: Theory and Evidence discovered a strong positive relationship between the effectiveness of financial policies and long-run economic growth (Levine, 2004). Domestic credit may be a poor predictor of economic performance in instances when major financial innovation occurs outside of the banking sector. This effect, however, varies with country and time. Furthermore, as seen in the Latin American experience of the 1970s and 1980s, unconstrained financial liberalization and expectations of government bailouts may result in a negative relationship between the degree of financial reforms and economic performance (De Gregorio and Guidotti, 1995). This study builds on Montiel's (1995) work by presenting an economic performance model that incorporates an interaction of real interest rates with initial financial policies (Roubini and Sala-i-Martin, 1992; Levine, 1991; Agarwala, 1983; Gelb, 1988). We also include one critical aspect of economic performance- the bank liquid reserves to bank assets ratio- since it represents that the regulation of the bank liquid reserves to bank assets requirement plays an important role (Roubini and Sala-i-Martin, 1992) by stating that, where a high degree of financial policies is achieved, among other methods, through high necessary reserves for commercial banks, it leads to a lower level of economic performance. The variables are transformed to their natural logarithms, and the study adopts a double log model to avoid the incidence of heteroscedasticity, outliers, and the development of elasticity connections, similar to related studies (Nathaniel and Adeleye, 2021; Okoro, Adeleye, Okoye, and Maxwell, 2021; Okoye, Omankhanlen, Okoh, Adeleye et al., 2021; Shahbaz, Mahalik, Shahzad, and Hammoudeh, 2019; Sharif, Raza, Ozturk, and Afshan, 2019). The empirical model is built by first controlling for bank liquid reserves, then disintegrating financial policy for robustness testing. The modified model is thus provided in the connection below. The linear model that answers the first question defines GDP growth as a function of domestic credit to the private sector and real interest rates, as shown in Equation (1):

$$lnGDPgrth_{it} = \alpha_0 + \alpha_1 lnDCPS_{it} + \alpha_2 lnRIR_{it} + \alpha_3 lnBLR_{it} + d_t + u_{it}$$
(1)

where *ln* represents the natural logarithm. *GDPgrth* is gross domestic product growth (annual percentage); *DCPS* is domestic credit to the private sector (percentage of GDP); and *RIR* is the real interest rate (%). *BLR* is the ratio of bank liquid reserves to bank assets (%); i is the number of nations in the sample (1, 2, *N*); t is the number of years (1, 2..., *T*); and d_t represents the time trend used to control changes in the dependent variable. where u_{it} denotes an idiosyncratic error term with an independent and identical distribution.

To answer the second issue of whether *RIR* moderates the influence of *DCPS* on *GDP* growth, *Eq* (1) is modified to include the interaction term, and the moderation model is provided in *Eq* (2):

$$lnGDPgrth_{it} = \alpha_0 + \alpha_1 lnDCPS_{it} + \alpha_2 lnRIR_{it} + \alpha_3 lnBLR_{it} + \alpha_4 ln(DCPS * RIR)_{it} + d_t + u_{it}$$
(2)

The sign of the interaction coefficient, α_4 , affects whether real interest rates on domestic credit to the private sector increase or hinder *GDP growth*. A positive signal indicates that real interest rates worsen the negative impact of domestic credit to the private sector on *GDP growth*, and vice versa. The statistical significance of α_4 is crucial in establishing the net effect of *DCPS* on *GDP growth*. If it is statistically significant, it is factored into the net effect calculation; if it is insignificant, it implies that it is not statistically different from zero, and *DCPS*'s net effect on *GDP growth* equals its unconditional marginal effect. *Equation (3)* calculates the net effect of domestic credit to the private sector on GDP growth, conditional on income:

$$\frac{\partial lnGDPgrth}{\partial lnDCPS} = \alpha_2 + \alpha_4 lnRIR \tag{3}$$

 α_2 is meant to be positive. Higher real interest rates reduce the impact of domestic private sector credit on GDP growth (α 4 > 0). If α_4 < 0, the negative impact of domestic credit on the private sector is determined by the degree of the net effect. If α_4 is negative and α_2 is positive, real interest rates increase the impact of domestic credit to the private sector on *GDP growth*. If the negative sign of α_4 is less than the positive sign of α_2 , it indicates that real interest rates are not enough to mitigate the positive impact of domestic credit to the private sector and real interest rates have no significant impact on *GDP growth*.

Estimation techniques

The study uses both static and dynamic models to reach its research goals in a logical manner. These estimation methods are appropriate and have been used in previous research (Bourguignon, 2004; Fosu, 2017; Marrero and Serven, 2018; Iyke, 2017), as is the use of a short panel data set of 70 nations (N) over 21 years (T), implying that *N* > *T*. Similarly, these methodologies work together to examine the consistency of the relationship between the variables of interest. The static models include pooled ordinary least squares (POLS), which do not account for panel heterogeneity, and fixed effects (FE), which do, whilst the dynamic model is the systems generalized method of moments (sys-GMM). The sys-GMM estimator is intended for short panel analysis and makes the following assumptions about the data-generation process: the process may be dynamic, with current realizations of the dependent variable influenced by prior realizations; and the regressors are not strictly exogenous and may be related to previous and maybe current realizations of the error term. This study acknowledges the potential endogeneity in financial policy variables, specifically domestic credit to the private sector, and real interest rates, as these may be correlated with unobserved economic factors. To address this issue, the methodology employs: (1) Instrumental Variable (IV) Approach - This technique isolates the true effect of financial policy on GDP growth by using external instruments. (2) System Generalized Method of Moments (Sys-GMM) – A dynamic panel estimator that corrects for endogeneity by using lagged values of endogenous variables as instruments. In the Sys-GMM approach, this study uses lagged values of domestic credit to the private sector and real interest rates as instruments. This approach is valid because: (1) Past values of financial policy variables influence present values but are unlikely to be correlated with contemporary economic shocks affecting GDP growth. (2) The Hansen J-test and Sargan test are applied to confirm the validity of the instruments and ensure they are not over-identified (i.e., not correlated with the error term). (3) The Arellano-Bond test for autocorrelation is conducted to verify that the instruments satisfy the necessary statistical conditions. To broaden the discussion, the study uses Adeleye et al. (2020) analytical approach to analyze data across income group delineations - high income, upper middle-income, lower middle-income, and low income – as well as geographic regions to see if the influence of the regressors on the outcome variable differs significantly across sub-samples. For the comparison study, the income groups are analysed solely using the POLS approach. The number of countries in each income category: high income (9), higher middle income (11), lower middle income (25), and low income (25). Given the 21-year data duration, only the lower middle- and low-income sub-samples match the criteria for doing FE and sys-GMM, and this technique is abandoned because it would preclude comparison analyses. Thus, just the POLS is used for comparison analysis. This study adopts a rigorous econometric approach by addressing key methodological challenges, including endogeneity, instrument validity, and model selection. By employing Sys-GMM, it ensures that the estimates yield meaningful policy insights while maintaining statistical credibility. The choice of Sys-GMM as the primary estimation model is particularly robust because it: accounts for feedback effects between financial policy and economic growth, addresses omitted variable bias by incorporating country-specific effects, mitigates measurement error issues by using lagged values of endogenous variables as instruments.

Variables	Full Sample	HI	UMI	LMI	LI
Constant	1.7051***	0.2527	0.3304	0.0784	2.7185***
	(-5.12)	(-0.05)	(-0.21)	(-0.12)	(-4.5)
InDCPS	-0.8808***	-56.658	-0.3491	1.4971**	-4.6055**
	(-2.77)	(-0.27)	(-0.72)	(2.17)	(-2.07)
InDCPSB	0.8713***	57.1994	0.2333	-0.9996	4.3089**
	(2.75)	(-0.28)	(-0.3)	(-1.65)	(-2.04)
lnRIR	0.2752**	1.8033	-0.275	0.8884***	-0.094
	(2.00)	(-0.79)	(-0.42)	(-2.92)	(-0.52)
lnBLR	-0.1175***	-0.3329	0.2244	-0.1408**	-0.1347
	(-2.63)	(-1.29)	(-1.35)	(-2.39)	(-1.35)
lnDCPS*lnRIR	-0.0856*	-0.5037	0.1673	-0.2720***	0.0501
	(-1.68)	(-0.92)	(-0.64)	(-2.80)	(0.63)
Net Effects	-1.044	n. a	n. a	1.044	n. a
Threshold(s)	negative synergy	n. a	n. a	5.50	n. a
Time Dummies	No	No	No	No	No
No. of Obs.	500	42	67	223	168
No. of Countries	70	9	11	25	25
R-Squared	0.07	0.18	0.1	0.04	0.05
F Statistic	7.26***	0.11	1.4	2.63**	1.87*

Table 4. Full sample and income group	analysis (dep. Var:	lnGDPgrth
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Note: *** p<0.01; ** p<0.05; * p<0.1; ln = Natural logarithm; GDPgrth = Gross domestic product growth; DCPS = Domestic credit to private sector; DCPSB = Domestic credit to private sector by banks; RIR = Real interest rate; BLR = Bank liquid reserves to bank assets ratio; HI = High Income; UMI = Upper Middle-Income; LMI = Lower Middle-Income; LI = Lower Income; t-statistics in (); n.a = not applicable due to the insignificance of marginal effects and/or unconditional effect of domestic credit to private sector.

Source: Authors' computation.

Estimations and discussions

The research examines the empirical relationship between financial policy, real interest rates, and economic performance in the MENA and SSA economies. The presentation of empirical findings that fill crucial gaps in the literature on financial policy, real interest rates, and economic performance focuses on whether financial policy improves or degrades economic performance, as well as whether its interaction with real interest rates promotes or degrades economic performance. The estimation process begins with income group analysis using the POLS approach, as shown in Table 4, followed by regional analysis using the FE and Sys-GMM processes, as shown in Table 5. To avoid duplication, these findings have been condensed into composite tables. Table 5 shows the "main" and "robustness" outcomes. Tables 4 and 5 are interpreted in sequence.

Pooled Ordinary Least Square results (POLS)

Table 4 shows that domestic credit to the private sector has a statistically significant impact on economic performance. The coefficient value for the full sample is -0.8808, which is significant at the 10% level, implying that a percentage shift in domestic credit to the private sector slows GDP growth. Given that GDP growth is a reliable indicator of economic performance, this finding explains why domestic credit to the private sector affects economic performance, validating the argument made by De Gregorio and Guidotti (1995) in their study of the Latin American experience of the 1970s and 1980s, in which unrestricted financial liberalization and expectations of government bailouts can lead to a negative association between the degree

of financial policy and economic performance. Domestic credit to the private sector has a negative impact on economic performance in the high income (-56.658), upper middle-income (-0.3491), and low income (-4.6055) groups, meaning that it slows GDP growth. Lower middle-income nations experience a different effect, with increasing domestic credit to the private sector leading to higher GDP growth (1.4971). The association between domestic credit to the private sector and economic performance follows a similar pattern: the coefficient is negative throughout the whole sample; high income, higher middle-income, and low-income parameters, while it is not statistically significant in high and upper middle-income countries. The coefficient of bank domestic credit to the private sector is statistically significant at the 10% and 5% levels for the full sample (0.8713) and low-income countries (4.3089), despite being positive in four of the five specifications. This suggests that increasing domestic credit to the private sector as a percentage of overall credit improves economic performance. This is the expected outcome of major financial innovation in the banking sector, which would increase access to financial services and promote GDP growth. The real interest rate has statistically significant positive coefficients for both the full sample (0.2752) and lower middle-income nations (0.8884), indicating that it has the potential to boost economic performance. Furthermore, the three parameters are statistically insignificant. The findings also show that increasing real interest rates boost GDP growth in high- and lower-middle-income countries. Increasing real interest rates stifle GDP growth in upper middle- and low-income countries. This clearly shows that high-income and lower-middle-income countries have stronger financial infrastructures and are more sensitive to interest rate variations than upper-middle-income and low-income countries. This study is consistent with Fry (1988) and De Gregorio and Guidotti (1995), who discovered that a positive real interest rate boosts financial savings while also increasing investment and economic performance. The bank liquid reserves-to-bank assets ratio indicates economic performance, with statistically significant negative coefficients for the full sample (-0.1175) and lower middle-income countries (-0.1408). In addition, none of the three specifications were statistically significant. The data also show that increasing the ratio of bank liquid reserves to bank assets stimulates GDP growth in upper middle-income countries (0.2244). An increase in the ratio of bank liquid reserves to bank assets slows GDP growth in high-income (-0.3329), lower-middle-income (-0.1408), and low-income (-0.1347) countries. This clearly implies that the financial system is stable and confident, which has increased investment and lending in upper middle-income nations during the research period. While high-income, lower-middle-income, and low-income countries show a lack of lending activity and limited access to credit for enterprises and individuals, economic growth was stifled over the study period. These findings support Roubini and Sala-i-Martin's (1992) claim that there is a negative relationship between bank liquid reserves to bank assets ratio and GDP growth.

Another significant finding is the interaction between domestic credit to the private sector and real interest rates, which consistently improves and degrades economic performance across all dimensions. Given the statistically significant negative coefficients of *DCPS*RIR* at the 5% and 10% levels for the full sample (-0.0856) and LMI countries (-0.2720), these findings support Roubini and Sala-i-Martin's (1992) hypothesis that the government enhances economic performance by restricting domestic credit to the private sector below the level of inflation, resulting in low and/or negative real interest rates. The findings are presented in terms of net effects, marginal effects, and thresholds at which real interest rates adjust financial policy to improve economic performance. The concept of threshold is entirely congruent with recent studies (Tchamyou, 2019; Asongu, 2017; Asongu et al., 2017a; Batuo, 2015). This is the critical mass at which the modulating influence of a policy variable completely dampens out an undesirable effect from the independent variable of interest, yielding a combined theoretically expected effect on the outcome variable. This concept is important in terms of informing policymakers about specific policy-moderating variable targets that must be attained in order to achieve the desired effects on development outcomes. As a result, policymakers are better informed when they understand the cut-off values at which real interest rates fully offset the negative impact of financial policy on economic performance. Above certain thresholds, real interest rates can interact with financial policy to boost economic performance. Furthermore, in order to be economically viable, the criterion must fall within the range (minimum to maximum) specified in the summary statistics. In this case, the chosen threshold has policy significance because the relevant ranges are "-74.181 to 38.975" for the real interest rate.

Table 4's fourth column shows that using real interest rates to enhance domestic credit to the private sector has a positive net effect (1.044) but a negative marginal effect (-0.2720). Although the net effect is positive, we extend the research by determining the threshold level at which the unconditional effect of domestic credit on the private sector becomes negative. To balance the impact of domestic credit on the private sector, a coverage ratio of 5.50% [1.4971/ (-0.2720)] is needed. It suggests that 5.50% coverage in real interest rates is needed to complement domestic credit to the private sector in order to eventually boost economic performance for low- and middle-income nations. According to existing research based on interaction regressions (Asongu & Nwachukwu, 2018; Asongu & Odhiambo, 2019; Asongu et al., 2021), the study computes net effects to examine the utility of real interest rates in changing the impact of domestic credit to the private sector on economic performance. For example, in Column 1 of Table 4, the net effect of real interest rates on the impact of domestic credit to the private sector on economic performance is -1.044 ([-0.0856 x 1.9114] + [-0.8808]). In this estimate, the average real interest rate is 1.9114 (*In6.7630*), the conditional effect of the interaction between real interest rate and domestic credit to the private sector is -0.0856, and the unconditional effect of domestic credit to the private sector is -0.8808. The first column in Table 4 investigates the role of real interest rates in modulating financial policy to improve economic performance. The marginal impact and net effect are -0.0856 and -1.044, respectively. Given that both the conditional and unconditional effects are negative, there is a clear negative synergy effect. Thus, calculating a threshold is not statistically viable.

The study's conclusions are based on Table 4. For the full sample, the function of real interest rates in moderating the effect of domestic credit to the private sector on economic performance has a negative net effect. The role of real interest rates in moderating the effect of domestic credit to the private sector on economic performance in low- and middle-income countries is beneficial overall.

Fixed effects and system GMM results

Table 5 summarizes the estimation results for both the static (fixed effects) and dynamic (system GMM) panel analyses. Domestic credit to the private sector is very certainly determined by an economy's economic performance level. In this approach, the government boosts economic performance by maintaining domestic credit to the private sector below inflation, resulting in low and/or negative real interest rates (Roubini and Sala-i-Martin, 1992). In other words, developing financial policies requires accurate monitoring of overall economic growth. A pre-estimation analysis revealed that two explanatory variables, domestic credit to the private sector (*DCPS & DCPSB*) and bank liquid reserves to bank assets ratio (*BLR*), were not strictly exogenous, underlining the need for robustness testing with the two-step system GMM (Windmeijer, 2005; Adeleye et al., 2020) corrected cluster robust errors to overcome the problem of endogeneity in the model (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998). According to Roodman (2009, 2014) and Adeleye et al. (2020), the study satisfies the fundamental prerequisites for GMM implementation. The initial cross-sectional dimension, N, is reasonably broad, allowing for a reliable Arellano-Bond autocorrelation test and cluster-robust standard errors.

Regions	Combined Result (MENA & SSA)		MENA Result		SSA Result	
Variables	RE (Main)	Sys-GMM (Robustness)	RE (Main)	Sys-GMM (Robustness)	RE (Main)	Sys-GMM (Robustness)
lnGDPgrth (-1)		0.1673*		0.4292**		0.0217
		(1.80)		(2.78)		(0.11)
lnDCPS	-0.9496**	-0.5842*	20.4241		-1.0341*	-2.6546**
	(-2.42)	(-1.72)	(0.15)		(-1.95)	(-2.30)
lnDCPSB	1.0706***	0.7607	-20.3225		1.0771*	2.9566
	(2.63)	(1.46)	(-0.15)		(1.90)	(1.42)
lnRIR	0.3791***	0.3860	0.4835*		0.2439*	1.6865
	(2.81)	(0.42)	(1.14)		(1.41)	(0.70)
lnBLR	-0.0801	-0.0189*	-0.2875	-0.7304**	-0.0803	-1.5457*
	(-1.39)	(-0.24)	(-1.74)	(1.20)	(-1.11)	(-1.98)
lnDCPS*lnRIR	-0.1103**	-0.1276*	-0.1622	0.0083	-0.0568	-0.5189
	(-2.50)	(-0.39)	(-1.38)	(0.05)	(-0.93)	(-0.54)
Constant	751.5696	0.5042	-1632.859			4.3730
	(1.23)	(0.25)	(-0.93)			(0.79)
Net Effects	-1.160	-0.828	n.a	n.a	n.a	n.a
Threshold(s)	negative synergy	negative synergy	n. a	n. a	n. a	n. a
Time effect	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	500	474	81	79	419	331
R-Squared	0.141		0.431		0.166	
Countries	70	70	22	22	48	48
Number of Groups	44	44	9	44	35	43
Hausman	1.0000		1.0000		0.6435	
F-test (prob)		0.000		0.000		0.000
Wald test (prob)	0.0000		0.0120		0.0000	
AR (1)		0.005		0.115		0.060
AR (2)		0.212		0.463		0.541
Hansen J test		0.192		1.000		0.999
Sargan test		0.177		0.299		0.436
Instruments		44		9		32
Note: *** p<0.01; ** p<	:0.05; * p<0.1; ln =	Natural logarithm	n; GDPgrth = Gro	ss domestic produc	ct growth; DCPS	= Domestic credit

Table 5. Results of the panel analysis

Note: *** p<0.01; ** p<0.05; * p<0.1; ln = Natural logarithm; GDPgrth = Gross domestic product growth; DCPS = Domestic credit to private sector; DCPSB = Domestic credit to private sector by banks; RIR = Real interest rate; BLR = Bank liquid reserves to bank assets ratio; MENA = Middle East & North Africa; SSA = Sub-Saharan Africa; t-statistics in (); RE = Random-effects GLS regression; n.a = not applicable due to the insignificance of marginal effects and/or unconditional effect of domestic credit to private sector.

Source: Authors' computation.

Given the major differences between the underlying algorithms of the fixed effects (main analysis) and system GMM (robustness analysis) methods, results interpretations will focus on (1) coefficient sign consistency and (2) statistical significance, if applicable. As in Table 5, the *DCPS* coefficient is negative for all model parameters and statistically significant at the 1% and 5% levels, with the exception of the MENA sample strategy. These findings indicate that domestic credit to the private sector has an economic performance reduction quality of -0.5842 to -2.6546 percent, consistent with previous research (De Gregorio and Guidotti, 1995). The data support the hypothesis that the negative effects of a lack of regulation were amplified by widespread expectations that the banking sector would be bailed out in the event of disaster,

leading to massive over-lending. Financial institutions will be less cautious when scrutinizing credit applications, and this inefficiency is likely to lead to a deterioration in long-term economic performance. According to Lamoreaux (1995) and Haber (1991, 2004a, b), the negative effect is that access to bank loans is limited to the wealthy and connected, resulting in lower economic performance. Using the GMM results, the magnitude for SSA (-260%) is significantly greater than for the combined sample (-58.4%). This implies that the rate of loss in economic performance induced by domestic credit to the private sector should accelerate in SSA.

The *DCPSB* coefficient is consistent with positive indicators and statistically significant for the full (1.0706) and SSA (1.0771) samples at the 10% and 1% levels, showing that banks' increased domestic credit to the private sector increases GDP growth and therefore economic performance. As expected, De Gregorio and Guidotti (1995) explained that domestic credit provided by banks to the private sector improves economic performance by enhancing investment efficiency. RIR is consistent across positive signals and statistically significant in the full (0.3791), MENA (0.4835), and SSA (0.2439) samples at the 10% and 1% levels, respectively. The evidence is particularly strong in MENA and SSA economies, but the impact appears to be considerably larger in MENA. Rising relative real interest rates (RIR) boost financial savings, investment, and economic performance by 48.3 percent in MENA and 24.3% in SSA, respectively. As the ratio of bank liquid reserves to bank assets (BLR) increases, GDP begins to decline. This is consistent throughout the GMM study, with statistically significant negative signals of 5% and 1%. This strong influence can be seen in the full (-0.0189), MENA (-0.7304), and SSA (-1.5457) samples, indicating that bank liquid reserves to bank assets ratios have a major impact on economic performance. Furthermore, the interaction term DCPS*RIR has a negative influence on both domestic credit to the private sector and GDP growth. As a result, it significantly lowers the incidence of economic performance over the full sample (-0.1103, -0.1276). This evidence differs significantly from the individual effects of RIR on the economic performance measures. When the interaction term is compared to the individual effects of *RIR* on the economic performance performance measures, the intensity of economic performance increases. The second column of Table 5's GMM analysis demonstrates that using real interest rates to increase domestic credit to the private sector has a negative net effect (-0.828) and a negative marginal effect (-0.1276). The net effect of real interest rates on domestic credit to the private sector on economic performance is $-0.828 = ([-0.1276 \times 1.9114] + [-0.5842])$. In this estimation, 1.9114 (In6.7630) is the mean real interest rate, -0.1276 is the conditional effect of the interaction between real interest rate and domestic credit to the private sector, and -0.5842 is the unconditional effect of domestic credit to the private sector. Identifying the role of real interest rates in altering financial policy to boost economic performance. The marginal impact is -0.1276; the net effect is -0.828. Given that both the conditional and unconditional effects are negative, there is a clear negative synergy effect. Thus, calculating a threshold is not statistically viable. However, according to Adeleye et al. (2020), the differential of -1.0599 (that is, -0.9496 - 0.1103) and -0.7118 (that is, -0.5842 - 0.1276) represents the total effect of DCPS on GDP growth. This means that interactions with real interest rates lessen the positive impact of domestic credit to the private sector on economic growth. This is a key finding that supports the idea that real interest rates boost economic performance, irrespective of the negative impact of domestic credit to the private sector.

That is, the level of real interest rates reduces the effect of domestic credit to the private sector on regional economic growth. The preceding illustrates that real interest rates have a vital role in enhancing economic performance in both MENA and SSA economies, with MENA having a higher impact. The postestimation diagnosis (presented in the lower panel of Table 5) shows that the generated parameters are accurate, consistent, and suitable for drawing inferences. Windmeijer (2005) asserts that reducing the number of instruments used minimizes the mean bias of parameters. This argument supports Roodman's (2009) claim that the proliferation of instruments may result in parameter overestimation. Despite the importance of instrument selection in addressing simultaneity and its impact on GMM outcomes (Iyke, 2017; 2018, Adeleye et al., 2020), there is no consensus on the appropriate number of instruments (Leòn-Gonzàlez and Montolio, 2015).

The study's conclusions are based on Table 5. For the full sample study, the function of real interest rates in modulating the effect of domestic credit to the private sector on economic performance has a negative net effect. When the findings from Table 4 are cross-examined with those from Table 5, the following overall conclusions emerge: (i) domestic credit to private sector by banks is a substantial contributor to rising

economic performance; (ii) the real interest rate and domestic credit to private sector intensifies economic performance; and (iii) the real interest rate complements domestic credit to private sector to lower economic performance in the Middle East and North Africa and Sub-Saharan Africa.

Concluding implications and future research directions

This study investigated how real interest rates interact with financial policy to influence economic performance. It makes a substantial contribution to the discussion on the economic performance nexus by conducting comparative assessments of the interaction of domestic credit to the private sector, economic performance, and real interest rates from 2000 to 2020 in a sample of 70 Middle Eastern, North African, and Sub-Saharan African countries. Financial policy is measured by banks' domestic credit to the private sector, but economic performance is measured by GDP growth. Findings from both static and dynamic studies spanning both full and sub-sample estimations suggest that (i) domestic credit to private sector by banks is a significant contribution to increasing economic performance, (ii) the real interest rate and domestic credit to private sector intensifies economic performance, and (iii) the real interest rate complements domestic credit to private sector to reduce economic performance in the Middle East and North Africa and Sub-Saharan Africa.

Another interesting observation is substantial evidence of net effects. Fortunately, in two of the situations, (i) the net effect of utilizing real interest rates to influence domestic credit to the private sector in order to improve economic performance is negative. It lends credence to the claim that financially restricted economies are defined by credit rationing and artificially low real interest rates. Governments in financially constrained economies sometimes keep deposit and lending rates below inflation, resulting in low and/or negative real interest rates. As a result, it is critical to consider enacting and/or assessing legislation that promote access to credit, particularly for the poor, by keeping capital moving to capitalize on investment opportunities. Lower real interest rates, which can stimulate investment in capital goods, resulting in productivity increases, may be more advantageous when combined with economic performance-boosting measures in MENA and SSA (ii) the unconditional effects associated with the net positive effects are negative in MENA and SSA countries with low middle incomes. The policy range includes thresholds for negative marginal effects, such as 5.50% [1.4971/ (-0.2720)] real interest rate for domestic credit to the private sector. The threshold represents the real interest rate at which the unconditional negative impacts of domestic credit to the private sector can turn positive. The computed threshold makes economic sense because it is within the summary data's real interest rate range (-74.181 to 38.975). Before delving into the practical and policy implications, it is critical to define the concept of thresholds discussed above.

The concept of threshold or critical mass refers to the point at which higher interest rates interact with domestic credit to the private sector, producing a net positive effect on economic performance. As a result, when the computed thresholds are within the statistical range, policymakers can effectively raise real interest rates over the established thresholds to achieve the desired effect on economic performance. This concept of 'threshold' is congruent with research, particularly: minimal conditions for desired effects (Cummins, 2000; Asongu et al., 2017b); critical masses for appealing effects (Roller and Waverman, 2001; Batuo, 2015); and criteria for inverted U-shaped and U-shaped patterns (Ashraf and Galor, 2013).

In terms of practical applications, the findings indicate that lower real interest rates can lower borrowing costs, hence boosting the impact of domestic credit to the private sector on economic performance. This finding is consistent with previous research that suggests that real interest rates increase financial savings by expanding lending to the private sector, hence increasing investment and growth (Fry, 1988; De Gregorio and Guidotti, 1995). For example, the real interest rate can be utilized to lower the cost of borrowing, so encouraging businesses to invest. It can also encourage spending by making it cheaper for customers to fund purchases using consumer loans. Real interest rates and domestic credits to the private sector have the potential to boost economic performance indicators such as GDP growth, investment, consumer confidence, and spending.

The study's main theoretical contribution is that by sharing information, real interest rates are related to domestic credit to the private sector, and so, ex post, lower real interest rates can cut borrowing costs, which can improve economic performance. The theoretical function of real interest rates is essentially

consistent with the theoretical foundations of financial policies aimed at enhancing and reducing economic performance (Fry, 1988; Gregorio and Guidotti, 1995; Montiel, 1995). As a result of this parallel, the theoretical basis for increasing GDP growth through domestic credit to the private sector is generally compatible with the importance of using real interest rates to reduce borrowing costs, both of which are connected with the potentially negative impact of financial policy on economic performance.

In summary, the key implications for financial policy in Middle Eastern, North African, and Sub-Saharan African nations are that: (i) real interest rates can modulate the effect of domestic credit to the private sector on GDP in order to achieve economic performance, and (ii) particular thresholds or critical masses of real interest rates are required to mitigate the positive effects of financial policy on economic performance. Furthermore, the findings are unusual in that they are based on a cross-regional comparison of MENA and SSA countries, accounting for differences in disposal incomes, loan availability, household sizes, and entrepreneurship systems within and between regions. Future research may try to discover whether the study's established interconnections can bear empirical scrutiny when analyzed in the context of individual countries. Such country-specific inquiries are required for more targeted policy outcomes.

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Appendix

Table 1A. List of Countries, Regions and Income Groups.

S/No	Country	Region	Income Group
1	Algeria	MENA	Lower Middle Income
2	Angola	SSA	Lower Middle Income
3	Bahrain	MENA	High Income
4	Benin	SSA	Lower Middle Income
5	Botswana	SSA	Upper Middle Income
6	Burkina Faso	SSA	Low Income
7	Burundi	SSA	Low Income
8	Cabo Verde	SSA	Lower Middle Income
9	Cameroon	SSA	Lower Middle Income
10	Central African Republic	SSA	Low Income
11	Chad	SSA	Low Income
12	Comoros	SSA	Lower Middle Income
13	Congo, Dem. Rep.	SSA	Low Income
14	Congo, Rep.	SSA	Lower Middle Income
15	Cote d'Ivoire	SSA	Lower Middle Income
16	Djibouti	MENA	Lower Middle Income
17	Egypt, Arab Rep.	MENA	Lower Middle Income
18	Equatorial Guinea	SSA	Upper Middle Income
19	Eritrea	SSA	Low Income
20	Eswatini	SSA	Lower Middle Income
21	Ethiopia	SSA	Low Income
22	Gabon	SSA	Upper Middle Income
23	Gambia, The	SSA	Low Income
24	Ghana	SSA	Lower Middle Income
25	Guinea	SSA	Low Income
26	Guinea-Bissau	SSA	Low Income
27	Iran, Islamic Rep.	MENA	Lower Middle Income
28	Iraq	MENA	Upper Middle Income
29	Israel	MENA	High Income
30	Jordan	MENA	Upper Middle Income
31	Kenya	SSA	Lower Middle Income
32	Kuwait	MENA	High Income
33	Lebanon	MENA	Upper Middle Income
34	Lesotho	SSA	Lower Middle Income
35	Liberia	SSA	Low Income
36	Libya	MENA	Upper Middle Income
37	Madagascar	SSA	Low Income
38	Malawi	SSA	Low Income
39	Mali	SSA	Low Income
40	Malta	MENA	High Income
41	Mauritania	SSA	Lower Middle Income
42	Mauritius	SSA	Upper Middle Income
43	Morocco	MENA	Lower Middle Income
44	Mozambique	SSA	Low Income

45	Namibia	SSA	Upper Middle Income
46	Niger	SSA	Low Income
47	Nigeria	SSA	Lower Middle Income
48	Oman	MENA	High Income
49	Qatar	MENA	High Income
50	Rwanda	SSA	Low Income
51	Sao Tome and Principe	SSA	Lower Middle Income
52	Saudi Arabia	MENA	High Income
53	Senegal	SSA	Lower Middle Income
54	Seychelles	SSA	High Income
55	Sierra Leone	SSA	Low Income
56	Somalia	SSA	Low Income
57	South Africa	SSA	Upper Middle Income
58	South Sudan	SSA	Low Income
59	Sudan	SSA	Low Income
60	Syrian Arab Republic	MENA	Low Income
61	Tanzania	SSA	Lower Middle Income
62	Тодо	SSA	Low Income
63	Tunisia	MENA	Lower Middle Income
64	Turkey	MENA	Upper Middle Income
65	Uganda	SSA	Low Income
66	United Arab Emirates	MENA	High Income
67	West Bank and Gaza	MENA	Lower Middle Income
68	Yemen, Rep.	MENA	Low Income
69	Zambia	SSA	Lower Middle Income
70	Zimbabwe	SSA	Lower Middle Income

Source: World Development Indicators