

THE ROLE OF COMPETITION AND ECONOMIC FREEDOM IN BANK LENDING

Tsurayya Rafa Attaqiyya^{*}, Dadang Lesmana^{**}

^{*} Department of Business Management, Faculty of Creative Design and Digital Business, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

^{**} Corresponding author, Research and Innovation Agency of East Kutai, Sangatta, Indonesia

Contact details: Research and Innovation Agency of East Kutai, Jl. Parkir Utara, Kawasan Perkantoran Bukit Pelangi Gedung Serba Guna (GSG) Lantai 2 Ruang Garu, Sangatta, East Kalimantan, 75683, Indonesia



Abstract

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Based on theory, Stiglitz and Weiss (1981) caution that liberalization may not always expand credit due to governance challenges such as moral hazard and adverse selection. This study examines the effect of bank competition and economic freedom on bank lending, with particular attention to their governance and regulatory implications. Using a system generalized method of moments (system-GMM) approach on an unbalanced panel of 214 countries from 1993 to 2017, this study investigates both the individual effects and the interaction between bank competition and economic freedom. The results reveal that both variables individually exert a negative effect on bank lending. However, their interaction produces asymmetrical outcomes: it significantly increases lending in high-income countries, while reducing it in low- and middle-income countries. These results reinforce that a country's readiness to face market openness is a determining factor in increasing lending channels. These findings highlight the uneven impact of economic openness and suggest important implications for governance structures, regulatory frameworks, and policymakers in designing context-sensitive financial regulations.

Keywords: Bank Lending, Bank Competition, Economic Freedom, Regulation

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1. INTRODUCTION

Bank lending plays a crucial role in supporting economic growth by providing credit to households and businesses. Empirical evidence shows that credit expansion significantly promotes gross domestic product (GDP) growth, although the magnitude of its impact depends on domestic versus global drivers (Büyükbaşaran et al., 2022). In addition, lending has a positive and significant effect on economic growth

in Vietnam, but this relationship is shaped by banks' competitive strategies, with conservative banks limiting the transmission of growth to credit supply (Le et al., 2022). Financial shocks that constrain lending also produce adverse effects on the real economy, such as reduced corporate investment and employment (Bottero et al., 2020). Understanding the institutional determinants of lending behavior has therefore become an essential topic in financial economics and policy debates.

Some of the previous studies have examined the effect of bank competition (Khan et al., 2016; Rakshit & Bardhan, 2023; Liang et al., 2024; Dang & Nguyen, 2022; Nguyen et al., 2024; Al Azizah & Haron, 2025) and economic freedom (Chen, 2005; Ghosh, 2008; Defung & Yudaruddin, 2022; Socol & Iuga, 2023; Phan & Le, 2024; Legaspi, 2023) on lending behavior, most have treated these factors in isolation or within limited regional contexts. For example, Khan et al. (2016) investigated competition and lending only within the Association of South East Asian Nations (ASEAN), Yang and Shao (2016) focused on China, and Ghosh (2008) examined liberalization effects in India. While valuable, such regional or single-variable studies limit the generalizability of their findings and do not capture how institutional contexts may jointly shape credit allocation.

Although increased competition in the banking sector generally enhances credit availability for businesses, the impact of bank competition is not uniformly positive. Similarly, while economic freedom is recognized as an important institutional factor, the extent to which it moderates the competition-lending nexus across income groups remains underexplored. Bringing these two factors together is essential, as competition shapes banks' lending incentives, while economic freedom determines the institutional environment in which these incentives operate. Addressing this gap is crucial, as policy prescriptions based on single-country or single-factor analyses may not generalize globally.

This study seeks to answer two core research questions:

RQ1: How do bank competition and economic freedom jointly affect bank lending?

RQ2: Does this interaction differ between high-income and low- to middle-income countries?

By addressing these questions, the study provides insights into the institutional dynamics that shape credit provision across diverse economic contexts. This study employs a system generalized method of moments (system-GMM) approach on an unbalanced panel of 214 countries spanning 1993–2017. This methodology allows us to address potential endogeneity concerns and capture dynamic effects in lending behavior.

This study advances the understanding of how institutional frameworks, particularly bank competition and economic freedom, interact in shaping lending behavior. Our findings reveal that this interaction produces divergent effects depending on income level. In high-income countries, the synergy between competition and freedom tends to increase lending by expanding opportunities for new borrowers and investors, while loan quality can be maintained through stricter screening (Chen, 2005; Yang & Shao, 2016; Iman & Nagata, 2005). By contrast, in developing and lower-income countries, the same interaction may reduce lending, as banks often lack the institutional capacity to compete under financial openness (Iman & Nagata, 2005). These insights offer theoretical contributions to institutional banking literature and practical guidance for policymakers and managers in designing financial reforms suited to their country contexts.

This paper makes three main contributions. First, while prior studies have largely examined the effects of bank competition (Khan et al., 2016; Rakshit & Bardhan, 2023; Liang et al., 2024; Dang &

Nguyen, 2022; Nguyen et al., 2024; Al Azizah & Haron, 2025) and economic freedom (Chen, 2005; Ghosh, 2008; Defung & Yudaruddin, 2022; Socol & Iuga, 2023; Phan & Le, 2024; Legaspi, 2023) separately, our study complements this literature by analyzing their joint impact on bank lending in a global context. Second, it complements existing studies by offering a cross-country comparative perspective, particularly between low-middle-income and high-income economies — extending previous research that only focused on specific countries or regions such as China (Yang & Shao, 2016; Xie et al., 2019), Southeast Asian (Nguyen & Le, 2022), Saudi Arabia (Miyajima, 2020), Indonesia (Yudaruddin, 2022), and Europe (Asteriou et al., 2021). Third, it derives policies by demonstrating that the joint effects of bank competition and economic freedom are not uniform — while they stimulate lending in high-income economies, they suppress it in developing countries. These divergent outcomes highlight that liberalization policies need to be tailored to institutional capacity and income level, rather than applied uniformly across countries.

The remainder of this paper is structured as follows. Section 2 reviews the relevant literature and develops the theoretical framework. Section 3 describes the data and methodology. Section 4 presents the results. Section 5 presents the discussion. Section 6 concludes the paper with implications, limitations, and suggestions for future research.

2. LITERATURE REVIEW

2.1. Theoretical background

The concept of economic freedom builds on earlier discussions of liberty more broadly. Gastil (1987), through the Freedom of the World Index, introduced a systematic measurement of political and civil liberties as an indicator of openness. Although initially focused on political dimensions, this framework laid the foundation for later extensions into economic domains.

Scully and Slottje (1991) advanced this agenda by proposing one of the earliest cross-country measures of economic liberty, highlighting that the degree of economic choice available to individuals could be meaningfully quantified. Building on this, Gwartney and Lawson (2003) developed the Economic Freedom of the World Index, published by the Fraser Institute, which remains a central reference for empirical studies. This index captures five main domains of economic freedom: size of government, legal structure and property rights, access to sound money, freedom to trade internationally, and regulation of credit, labor, and business.

At the same time, Scully (2002) demonstrated that higher levels of economic freedom are positively associated with long-run economic growth, though he emphasized a trade-off with equity: redistributive policies may promote fairness but at the expense of efficiency and investment incentives. Complementing this framework, the Heritage Foundation and the *Wall Street Journal* in 1995 launched the Index of Economic Freedom, consisting of ten components, including Financial Freedom and Business Freedom (Hussain & Haque, 2016), which are often employed in comparative analyses.

Nonetheless, overly liberal interpretations of economic freedom face important critiques. Stiglitz and Weiss (1981) argue that financial liberalization does not necessarily lead to an expansion of credit supply, since structural problems such as moral hazard and adverse selection persist. Thus, while economic freedom is generally recognized as a driver of efficiency and growth, regulatory institutions remain crucial in mitigating market failures and ensuring stability.

2.2. Bank competition and lending

Research on bank competition and lending has generated diverse findings across contexts. For instance, Khan et al. (2016) in the ASEAN region reported that declining interbank competition weakens monetary policy transmission, as banks prioritize profitability over credit expansion. Similarly, Rakshit and Bardhan (2023) showed that low competition in India reduces the effectiveness of monetary policy in influencing credit supply. By contrast, Yang and Shao (2016), focusing on China, found that higher competition drives loan growth and reduces banks' sensitivity to policy shocks. These findings suggest that the relationship between competition and lending is shaped by institutional and market structures.

The literature further highlights two contrasting views. The competition-stability view argues that competition reduces loan rates, enhances efficiency, and broadens access to credit (Liang et al., 2024). In contrast, the competition-fragility view maintains that competition compresses profit margins, weakens incentives for prudent lending, and may undermine financial stability (Dang & Nguyen, 2022). More recent studies add nuance: Gonzalez (2023) finds that stronger creditor rights enhance bank competition, especially when entry restrictions are low, but this may reduce stability. Shikimi (2023) also shows that under prolonged low interest rates, competitive pressures amplify banks' risk-taking, particularly among weaker institutions, raising concerns for loan quality and default risk. Together, these studies underscore that competition does not exert a uniform effect on bank lending, but rather depends on institutional context, regulatory environment, and governance quality.

2.3. Economic freedom and lending

Economic freedom — capturing openness, regulatory quality, and institutional capacity — also influences lending outcomes. Empirical evidence shows mixed effects. Abbas (2021) finds that investment and trade freedom encourage banks' risk-taking, while financial freedom tends to reduce it, suggesting heterogeneity across sub-dimensions of freedom. In Europe, Chortareas et al. (2013) show that greater financial freedom improves bank efficiency, but this effect is stronger when governance quality is high, indicating that institutional conditions shape the benefits of freedom.

Additional recent work emphasizes the effects of liberalization on lending costs and efficiency. Nguyen and Ho (2024) show that credit market liberalization — reflected in fewer interest rate controls and greater private credit access — lowers loan costs by reducing liquidity shortages and uncertainty, thereby improving capital allocation to the private sector, particularly small and medium-

sized enterprises (SMEs). Chen et al. (2025) similarly find that interest rate liberalization reduces banks' monopoly power, leading to more efficient loan pricing and improved resource allocation, though potentially at the expense of greater systemic risk if regulatory oversight is weak.

Other country-level evidence provides further nuance. Chen (2005) finds that liberalization improves loan screening and credit quality, while Ghosh (2008) shows that India's liberalization initially raised non-performing loans, but later reduced them as banks became more selective. In Africa, Adem (2025) notes that financial freedom reforms aimed at expanding credit to the private sector can indeed increase lending, but often in the form of speculative loans with relaxed criteria, raising systemic risk. Collectively, these studies highlight that while economic freedom fosters greater credit access and efficiency, its effects on loan quality and stability remain conditional on institutional capacity and market conditions.

2.4. The role of competition and economic freedom on bank lending

Despite extensive research on competition and freedom separately, their interaction remains less explored. Some studies suggest that economic freedom may amplify or condition the effects of competition. Abbas (2021) shows that trade freedom intensifies competition, thereby raising banks' risk-taking incentives. Similarly, Socol and Iuga (2023) note that economic freedom combined with adequate regulation fosters healthy competition, innovation, and efficiency, while in weaker institutional settings it can trigger excessive competition and instability. Chen (2005) also argues that under liberalized markets, competition leads to more prudent lending as banks strengthen their screening mechanisms.

Recent contributions reinforce this perspective. Adem (2025) highlights that in Africa, financial freedom reforms intended to expand private-sector credit also heighten competition but sometimes result in speculative lending. Yin (2021) adds a cross-country perspective, showing that foreign bank entry increases competition in advanced economies but may reduce it in developing ones due to consolidation and rent-seeking effects that depend on regulation and supervisory quality. These findings suggest that freedom-driven reforms can reshape competitive dynamics differently across institutional settings.

3. DATA AND METHODOLOGY

3.1. Data

This study uses data taken from the Global Financial Development and Worldwide Governance Indicators, which consist of 214 countries in the period 1993–2017, and we divide the research sample into high-income countries and low and middle-income countries. In addition, the dependent variable of this research is bank lending (*LOAN*) as measured by domestic credit to the private sector (% of GDP), following Yudaruddin (2022). Furthermore, we also use economic freedom (*EF*) as an independent variable issued by the Heritage Foundation as a good measure to see the quality of government institutions (Defung & Yudaruddin, 2022; Asteriou

et al., 2021; Ott, 2016). We also use bank competition (*BOONE*) as an independent variable in this study, following previous research (Albaity et al., 2019; Boone, 2008). Furthermore, we also use control variables in previous studies, such as net interest margin (*NIM*) (Dursun-de Neef &

Schandlbauer, 2022), *BOPO*, which is measured as the bank's cost-to-income ratio, and stability, which is measured using the *ZSCORE* (Yudaruddin, 2022), GDP growth per capita (*GGDPCAP*) (Asteriou et al., 2021), and stock market capitalization to GDP (*STOCK*) (Table 1).

Table 1. Definitions and notation of variables

Variables	Measure	Data level	Source
Dependent variables			
<i>LOAN</i>	Domestic credit to private sector (% of GDP)	Country	World Bank
Independent variables			
<i>BOONE</i>	A measure of the degree of competition, calculated as the elasticity of profits to marginal costs. To obtain the elasticity, the log of profits (measured by return on assets (ROA)) is regressed on the log of marginal costs. The estimated coefficient (computed from the first derivative of a trans-log cost function) is the elasticity. The rationale behind the indicator is that higher profits are achieved by more-efficient banks. Hence, the more negative the Boone indicator, the higher the degree of competition is, because the effect of reallocation is stronger	Country	World Bank
<i>EF</i>	The Index of Economic Freedom is employed, which is measured on a scale from 0 to 100	Country	World Bank
<i>FIN</i>	The Index of Financial Freedom is employed, which is measured on a scale from 0 to 100	Country	World Bank
Control variables			
<i>NIM</i>	Bank net interest margin (%)	Country	World Bank
<i>BOPO</i>	Bank cost to income ratio (%)	Country	World Bank
<i>ZSCORE</i>	It is estimated as $(ROA + (\text{equity/assets})) / \text{sd}(ROA)$; $\text{sd}(ROA)$ is the standard deviation of ROA. ROA, equity, and assets are country-level	Country	World Bank
<i>GGDPCAP</i>	Growth GDP per capita (constant 2005 US\$)	Country	World Bank
<i>STOCK</i>	Stock market capitalization to GDP (%)	Country	World Bank

3.2. Methodology

The purpose of our study is to examine the role of *EF* and competition on bank lending in all countries, high-income countries, and low and middle-income countries, as in Eq. (1). Then, we also interact with

competition with *EF* on bank lending in all countries, high-income countries, and low and middle-income countries, as for Eq. (2). In achieving this goal, we use panel data analysis like several previous studies (Muizzuddin et al., 2021; Defung & Yudaruddin, 2022; Yusgiantoro et al., 2019).

$$LOAN_{i,t} = \alpha_0 + \beta_1 LOAN_{i,t-1} + \beta_2 BOONE_{i,t} + \beta_3 EF_{i,t} + \beta_4 NIM_{i,t} + \beta_5 BOPO_{i,t} + \beta_6 ZSCORE_{i,t} + \beta_7 GGDPCAP_{i,t} + \beta_8 STOCK_{i,t} \quad (1)$$

$$LOAN_{i,t} = \alpha_0 + \beta_1 LOAN_{i,t-1} + \beta_2 BOONE_{i,t} + \beta_3 EF_{i,t} + \beta_4 (BOONE_{i,t} * EF_{i,t}) + \beta_5 NIM_{i,t} + \beta_6 BOPO_{i,t} + \beta_7 ZSCORE_{i,t} + \beta_8 GGDPCAP_{i,t} + \beta_9 STOCK_{i,t} \quad (2)$$

where *i* and *t* denote country level *i* and year *t*. Several studies using lagged dependent variable as $LOAN_{i,t-1}$ as instrument variable of GMM beside AR(2) test and Hansen-J test (Muizzuddin et al., 2021; Yusgiantoro et al., 2019). Our main independent variables are competition (*BOONE*) and economic freedom (*EF*). Our control variables are specific (*NIM*, *BOPO*, *ZSCORE*) and macroeconomic (*GGDPCAP*, *STOCK*). Furthermore, we interact with the competition institutional quality on bank stability in all countries, both developing and developed. In achieving this goal, we use panel data analysis like several previous studies (Muizzuddin et al., 2021; Defung & Yudaruddin, 2022; Yusgiantoro et al., 2019).

Additionally, we also analyzed the alternative economic freedom (*EF*) component with financial freedom (*FIN*) and business freedom (*BUSS*). We adopted several previous studies that examined the influence of *FIN* (Hussain & Haque, 2016; Adam

et al., 2024) and *BUSS* (Joaquim et al., 2020; Ott, 2016) on bank lending. Both factors were found to play a significant role in influencing credit distribution.

In analyzing the effect of competition and institutional quality on bank stability, there is still the possibility of reverse causality problems. So, we use the system-GMM analysis proposed by Blundell and Bond (1998). Furthermore, this study takes into account the limited sample correction proposed by Windmeijer (2005); then, this research is said to be valid if the AR(2) test and the Hansen-J test are not rejected as a whole.

4. RESULT

In this section, we show descriptive statistics in Table 2, which consists of observation (obs.), average value (mean), standard deviation (std. dev.), and difference (t-stat.), as follows:

Table 2. Descriptive statistics

Variables	All countries			High-income countries			Low and middle-income countries			Diff. (t-stat.)
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	
Panel A: Dependent variables										
LOAN	4390	46.3139	42.7041	1363	81.4591	47.2903	3027	30.4887	28.8373	-50.970***
Panel B: Independent variables										
BOONE	2520	-0.5498	7.8159	910	-1.2633	12.6984	1610	-0.1465	2.0226	1.1167**
EF	3666	59.5117	11.3192	1149	69.9783	7.5517	2517	54.7337	9.3674	-15.24***
Panel C: Control variables										
NIM	3842	4.9529	4.3033	1352	2.6255	1.6360	2490	6.2166	4.7523	3.5911***
BOPO	3888	57.1668	16.7327	1358	56.3311	16.896	2530	57.6154	16.6302	1.2843**
ZSCORE	3908	13.4000	8.6200	1354	14.6527	8.4372	2554	12.7359	8.6437	-1.9168***
GGDPCAP	4843	13741.2	20944.4	1605	35038.5	25063.5	3238	3184.70	2919.76	-31853.8***
STOCK	2352	51.9612	84.8203	1133	74.3689	110.196	1219	31.1342	41.2297	-43.234***

Note: ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively; standard errors of each coefficient are in parentheses.
Source: Authors' calculation.

The average value of bank lending (LOAN) is highest in high-income countries (81.4591) and lowest in low- and middle-income countries (30.4887). Bank competition (BOONE) is more intense in high-income countries (-1.2633) than in low- and middle-income countries (-0.1465). Similarly, economic freedom (EF) is higher in high-income countries (69.9783) compared to low- and middle-income countries (54.7337).

Furthermore, in Table 3 below, the correlation matrix is used to test the relationship between the independent variables in this study (Amalia et al., 2022). Lestari et al. (2022) state that the correlation matrix value must be less than 0.800 so that multicollinearity does not occur. The results in Table 3 show that the largest correlation value is in economic freedom (EF) and business freedom (BUSF) of 0.7608, so this research does not exhibit multicollinearity.

Table 3. Correlation matrix

Variables	BOONE	EF	NIM	BOPO	ZSCORE	GGDPCAP	STOCK
BOONE	1.0000						
EF	-0.1117	1.0000					
NIM	0.0918	-0.4313	1.0000				
BOPO	0.0438	-0.0529	0.0556	1.0000			
ZSCORE	-0.1202	0.1114	-0.1448	-0.1573	1.0000		
GGDPCAP	-0.3199	0.6039	-0.5445	-0.0374	0.0722	1.0000	
STOCK	-0.0814	0.4773	-0.2725	-0.0896	0.1095	0.3353	1.0000

Source: Authors' calculation.

The regression results in Table 4 show that bank competition has a negative and significant effect on bank lending in the global sample (-1.7035, -1.4276) and in high-income countries (-1.4902, -1.6495), while in low- and middle-income countries the coefficients are positive but not significant (30.0615, 26.6709). Economic freedom also exerts a negative and significant impact on bank lending at the global level (-0.1869, -0.1821), but the effect is

statistically insignificant in both high-income and low- and middle-income groups. When bank competition is interacted with economic freedom ($BOONE \times EF$), the results reveal contrasting patterns: in high-income countries, the interaction is positive and significant (0.0191, 0.0212), whereas in low- and middle-income countries it turns negative and significant (-0.5645, -0.5145).

Table 4. The impact of bank competition and economic freedom on bank lending

Expl. variables	Dependent variables: LOAN					
	All countries		High-income countries		Low and middle-income countries	
	(1)	(2)	(3)	(4)	(5)	(6)
LOAN LI	1.0920*** (0.0649)	1.0916*** (0.0657)	1.0327*** (0.0653)	1.0485*** (0.0705)	1.0581*** (0.0502)	1.0583*** (0.0500)
BOONE	-1.7035** (0.6852)	-1.4276** (0.5458)	-1.4902*** (0.4888)	-1.6495*** (0.4300)	30.0615 (18.104)	26.6709 (19.281)
BOONESQ		-0.0001 (0.0002)		0.00003 (0.0002)		-0.7910*** (0.2529)
EF	-0.1869** (0.0883)	-0.1821** (0.0895)	-0.1257 (0.1379)	-0.1487 (0.1338)	-0.1253 (0.0817)	-0.1217 (0.0838)
BOONE $\times$ EF	0.0216** (0.0084)	0.0177** (0.0069)	0.0191*** (0.0060)	0.0212*** (0.0056)	-0.5645* (0.3207)	-0.5145 (0.3360)
NIM	0.5160 (0.3463)	0.4967 (0.3471)	-0.1066 (0.8881)	0.1230 (0.9631)	0.2036 (0.2142)	0.2083 (0.2158)
BOPO	-0.0428** (0.0213)	-0.0428** (0.0214)	-0.0107 (0.0386)	-0.0174 (0.0377)	-0.0377** (0.0182)	-0.0355* (0.0188)
ZSCORE	-0.0425 (0.0297)	-0.0450 (0.0299)	-0.0258 (0.0460)	-0.0261 (0.0436)	-0.0549 (0.0512)	-0.0545 (0.0515)
GGDPCAP	-0.00001 (0.00004)	-0.00001 (0.00004)	1.37e-06 (0.00003)	-5.79e-06 (0.00004)	0.00004 (0.0001)	0.0000 (0.0001)
STOCK	0.0056 (0.0079)	0.0054 (0.0081)	0.0096** (0.0044)	0.0088* (0.0049)	0.0003 (0.0198)	0.0007 (0.0199)
CONSTANTA	11.7318*** (3.2090)	11.6343*** (3.2808)	10.1523 (6.1709)	10.6422* (5.5829)	9.5366** (3.7688)	9.1319** (3.9356)
Dummy years	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1448	1448	685	685	763	763
Number of groups	109	109	48	48	61	61
Number of instruments	45	46	45	46	45	46
AR(2) test	0.492	0.487	0.833	0.825	0.079	0.081
Hansen-J test	0.158	0.147	0.177	0.222	0.285	0.267

Note: ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively; standard errors of each coefficient are in parentheses.
Source: Authors' calculation.

5. DISCUSSION

The interaction between bank competition and economic freedom provides the most important insight of this study, as it reveals contrasting outcomes across income groups. While bank competition alone reduces lending and economic freedom alone constrains credit growth, their combination produces opposite effects depending on institutional capacity. In high-income countries, the interaction term is significantly positive (0.0191; 0.0212), suggesting that competition under liberalized conditions strengthens credit allocation. By contrast, in low- and middle-income countries, the interaction is significantly negative (-0.5645; -0.5145), indicating that financial openness without adequate institutional support reduces credit distribution instead of enhancing it.

In high-income countries, strong regulatory frameworks and advanced financial markets enable banks to respond positively to the dual pressures of competition and liberalization. The positive interaction coefficient (around 0.02) implies that openness amplifies banks' ability to expand lending while maintaining credit quality. Chen (2005) shows that liberalization in developed economies improves screening mechanisms and encourages more efficient lending practices, while Yang and Shao (2016) argue that openness attracts new investors and competitors who expand credit availability. Similarly, Iman and Nagata (2005) find that institutional maturity in advanced markets allows banks to integrate openness into their lending strategies without compromising stability. These insights help explain why banks in high-income countries can leverage competition to improve efficiency and expand credit.

In contrast, the negative coefficients for low- and middle-income countries (about -0.56 and -0.51) highlight the risks of liberalization in weaker institutional environments. Ullah and Inaba (2014) demonstrate that without strong supervision, economic freedom in developing economies often results in lower credit supply rather than expansion. Immature financial markets and limited regulatory enforcement discourage banks from extending credit under competitive pressure, as they face greater risks of default and instability. As noted by Iman and Nagata (2005), countries with underdeveloped institutions are unable to fully absorb the benefits of openness, leading to adverse outcomes. This suggests that for low- and middle-income countries, liberalization must be accompanied by institutional strengthening and governance reforms before it can generate positive impacts on bank lending.

To strengthen the baseline analysis, a robustness test was conducted by replacing the economic freedom component with financial freedom and business freedom. Both financial freedom and business freedom are among the 10 core components of economic freedom, as formulated by the Heritage Foundation and the Wall Street Journal in 1995 (Hussain & Haque, 2016), making them relevant substitutes for comparative analysis. In Table 5, the impact of bank competition and financial freedom on bank lending is examined. The results show that the effect of bank competition (Eq. 1) remains consistent with the main findings, exhibiting negative and significant impacts for all countries and high-income countries, while showing positive but insignificant effects for low- and middle-income countries. These findings indicate that higher competition continues to reduce bank lending overall, while the inconsistent results for low- and middle-income countries suggest that the effects of competition in these economic contexts tend to be more ambiguous.

Financial freedom (Eq. 2) shows no statistically significant effect on lending across all country groups. This finding is consistent with previous studies, such as Bumann et al. (2013), who also reported that the effects of financial liberalization (or financial freedom) on economic growth tend to be weak. One possible explanation, as argued by Stiglitz and Weiss (1981), is that credit may not expand under liberalized conditions due to persistent issues like moral hazard or adverse selection.

However, when interacting with bank competition (Eq. 3), financial freedom yields significant outcomes that align with the core findings of the economic freedom model. In high-income countries, the interaction is positive and significant, indicating that financial freedom amplifies competition's efficiency benefits, likely through stricter risk assessment and improved loan allocation. These results are consistent with prior research. Adam et al. (2024) highlight that financial freedom strengthens both bank stability and operational efficiency, supporting its role as a core dimension of economic freedom. Conversely, in low- and middle-income countries, the interaction is negative and significant, reflecting instability risks in weaker institutional environments. These findings mirror the economic freedom results, where bank competition consistently exerts positive effects when supported by complementary policies, such as economic policies. Thus, while financial freedom alone lacks significance, its interaction with competition reveals its relevance, particularly when paired with supportive reforms like regulatory and institutional strengthening.

Table 5. The impact of bank competition and financial freedom on bank lending

Expl. variables	Dependent variables: LOAN					
	All countries		High-income countries		Low and middle-income countries	
	(1)	(2)	(3)	(4)	(5)	(6)
LOAN LI	1.0802*** (0.0674)	1.0778*** (0.0668)	1.0174*** (0.0692)	1.0373*** (0.0781)	1.0445*** (0.0504)	1.0422*** (0.0502)
BOONE	-0.9167*** (0.3299)	-0.6866*** (0.2004)	-0.7092*** (0.2521)	-0.7499*** (0.1715)	8.8953* (4.4910)	6.9125 (5.0207)
BOONESQ		-0.0002 (0.0003)		-0.00003 (0.0003)		-0.5834** (0.2291)
FIN	-0.0132 (0.0283)	-0.0115 (0.0280)	0.0255 (0.0479)	0.0187 (0.0433)	-0.0296 (0.0234)	-0.0272 (0.0242)
BOONE × FIN	0.0103*** (0.0034)	0.0071*** (0.0026)	0.0082*** (0.0026)	0.0085*** (0.0024)	-0.2498** (0.1092)	-0.2151* (0.1164)
NIM	0.5028 (0.3796)	0.4653 (0.3676)	-0.1124 (0.8978)	0.1139 (1.0367)	0.1633 (0.2006)	0.1638 (0.2004)
BOPO	-0.0407* (0.0211)	-0.0415* (0.0215)	-0.0003 (0.0334)	-0.0069 (0.0349)	-0.0405** (0.0180)	-0.0388** (0.0181)
ZSCORE	-0.0446 (0.0309)	-0.0459 (0.0310)	-0.0316 (0.0459)	-0.0323 (0.0424)	-0.0650 (0.0628)	-0.0647 (0.0624)
GGDPCAP	-0.00003 (0.00005)	-0.00003 (0.00005)	-1.27e-06 (0.00004)	-0.0000 (0.0000)	0.00002 (0.0001)	0.0002 (0.0001)
STOCK	0.0025 (0.0083)	0.0023 (0.0085)	0.0071 (0.0066)	0.0054 (0.0074)	0.0062 (0.0155)	0.0065 (0.0155)
CONSTANTA	1.9233 (2.4062)	2.2039 (2.3668)	0.6941 (4.7419)	0.04062 (5.2654)	4.4134** (1.8397)	4.1819** (1.8229)
Dummy years	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1451	1451	685	685	766	766
Number of groups	109	109	48	48	61	61
Number of instruments	45	46	45	46	45	46
AR(2) test	0.479	0.471	0.832	0.834	0.078	0.081
Hansen-J test	0.142	0.135	0.154	0.205	0.302	0.300

Note: ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively; standard errors of each coefficient are in parentheses.
Source: Authors' calculation.

Next, the analysis of bank competition and business freedom on bank lending is presented in Table 6. The results reveal that bank competition has a statistically significant negative effect on credit distribution, particularly in advanced economies (Eq. 1). This pattern reinforces the argument that increased competition may dampen banks' willingness or ability to lend, as it reduces profit margins and risk tolerance.

Furthermore, the analysis of business freedom (Eq. 2) consistently reveals a significant negative impact on credit distribution in high-income countries, similar to the main findings for economic freedom in Table 4. This suggests that deregulating the business sector, without broader financial or institutional reforms, may inadvertently diminish banks' willingness to lend. This interpretation is supported by Joaquim et al. (2020), who find that narrow business-sector deregulation can constrain credit supply, particularly when not embedded within comprehensive macro-financial reform strategies. Additionally, the interaction between bank competition and business freedom yields results that are directionally consistent with the core analysis in Table 4, suggesting a potential reinforcing effect between deregulation and competitive dynamics.

From the two robustness test analyses above, it is important to emphasize that financial freedom

and business freedom are merely partial components of the overall economic freedom. As such, their individual effects may not be as statistically significant as the aggregate economic freedom index. This finding is consistent with Ott (2016), who argues that individual sub-indices (such as financial freedom and business freedom) often fail to capture the systemic impact of economic freedom as a whole, especially when interactions between components are overlooked. Nevertheless, the overall pattern of the robustness tests remains aligned with the main findings: the interactions $BOONE \times FIN$ and $BOONE \times BUSS$ exhibit the same directional trends as $BOONE \times EF$ — positive in high-income countries and negative in low-middle-income countries. This consistency reinforces the validity of the core model, as supported by Chortareas et al. (2013), who found that the benefits of bank competition are only fully realized when embedded within a comprehensive economic policy framework, including aggregate economic freedom. In other words, while financial freedom and business freedom may show weaker standalone effects, they still contribute meaningfully to a coherent narrative that underscores the need for a holistic approach in understanding the relationship between competition, economic freedom, and bank credit.

Table 6. The impact of bank competition and business freedom on bank lending

Expl. variables	Dependent variables: LOAN					
	All countries		High-income countries		Low and middle-income countries	
	(1)	(2)	(3)	(4)	(5)	(6)
LOAN L1	1.0984*** (0.0634)	1.0999*** (0.6571)	1.0572*** (0.0703)	1.0628*** (0.0709)	1.0472*** (0.0496)	1.0479*** (0.0492)
BOONE	-0.8836* (0.4857)	-0.6413 (0.4795)	-0.5705 (0.4466)	-0.5155 (0.4738)	13.8689 (8.3588)	10.9877 (7.9701)
BOONESQ		-0.0002 (0.0001)		-0.0000 (0.0001)		-0.9566** (0.4228)
BUSS	-0.0842* (0.0433)	-0.0836* (0.0443)	-0.1425* (0.0742)	-0.1469** (0.0721)	-0.0145 (0.0289)	-0.0126 (0.0286)
BOONE x BUSS	0.0105* (0.0055)	0.0701 (0.0056)	0.0069 (0.0051)	0.0060 (0.0055)	-0.2801* (0.1494)	-0.2432 (0.1454)
NIM	0.5551 (0.3531)	0.5493 (0.3640)	-0.1887 (0.8155)	-0.1160 (0.8052)	0.1423 (0.1817)	0.1506 (0.1826)
BOPO	-0.0423** (0.0212)	-0.0424* (0.0214)	-0.0088 (0.0320)	-0.0105 (0.0307)	-0.0451*** (0.0162)	-0.0422** (0.0162)
ZSCORE	-0.0538 (0.0325)	-0.0565* (0.0331)	-0.0383 (0.0426)	-0.0419 (0.0416)	-0.0740 (0.0625)	-0.0745 (0.0621)
GGDPCAP	-0.00003 (0.00004)	-0.00003 (0.00004)	-7.42e-06 (0.00004)	0.00001 (0.00004)	0.0000 (0.0000)	0.0000 (0.0000)
STOCK	0.0016 (0.0081)	0.0012 (0.0084)	0.0069 (0.0062)	0.0065 (0.0062)	0.0030 (0.0160)	0.0034 (0.0160)
CONSTANTA	6.0233*** (2.0262)	6.0213** (2.0370)	11.3479*** (4.1727)	11.4627*** (4.1196)	4.3768* (2.3491)	3.9955* (2.3540)
Dummy years	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1451	1451	685	685	766	766
Number of groups	109	109	48	48	61	61
Number of instruments	45	46	45	46	45	46
AR(2) test	0.531	0.529	0.830	0.829	0.082	0.085
Hansen-J test	0.173	0.164	0.194	0.220	0.374	0.361

Note: ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively; standard errors of each coefficient are in parentheses. Source: Authors' calculation.

As part of the robustness checks, this study includes a dummy variable, *CRISIS*, to capture the impact of the 2007 Global Financial Crisis (GFC) on bank lending. The results indicate that the crisis had a negative and statistically significant effect on credit distribution (coefficient of -5.8651 in column 1 and -5.6381 in column 2, which is consistent with the main findings in Table 7. This suggests that macroeconomic shocks such as the 2007 GFC tend to reduce banks' ability or willingness to lend — both in high-income and low- and middle-income countries. This finding is in line with prior research examining the effects of financial crises on the banking sector. For instance, Acharya and Steffen (2020) find that crisis-triggered cash hoarding behavior among banks, which in turn led to credit tightening. Similarly, Yudaruddin (2022) shows that financial crises trigger risk-averse behavior among banks, prompting them to tighten lending standards or reduce loan volumes. These results further strengthen the validity of the model employed in this study by demonstrating consistent responses to well-documented external shocks. Thus, the inclusion of the GFC dummy not only reinforces the robustness of the main findings but also highlights that external factors such as financial crises can exacerbate the negative impact of competition and *EF* on credit supply — particularly in economies that are not well-equipped to absorb such shocks.

Table 7. The impact of bank competition and financial freedom on bank lending

Expl. variables	All countries	
	(1)	(2)
LOAN L1	1.0905*** (0.0603)	1.0767*** (0.0603)
BOONE	-2.0624* (1.1077)	-1.0577* (0.5742)
EF	-0.1724** (0.0743)	
BOONE x EF	0.0261* (0.0138)	
FIN		-0.0226 (0.5742)
BOONE x FIN		0.0118* (0.0062)
NIM	0.4115 (0.3101)	0.3749 (0.3276)
BOPO	-0.0240 (0.0192)	-0.0222 (0.0191)
ZSCORE	-0.0699** (0.0309)	-0.0687** (0.0318)
GGDPCAP	-0.00001 (0.00004)	-0.00003 (0.00004)
STOCK	0.0041 (0.0082)	0.0017 (0.0083)
CRISIS	-5.8651*** (1.5003)	-5.6381*** (1.5415)
CONSTANTA	10.8399*** (2.7490)	2.5010 (2.4290)
Dummy years	Yes	Yes
Observations	1448	1451
Number of groups	109	109
Number of instruments	46	46
AR(2) test	0.290	0.380
Hansen-J test	0.109	0.087

Note: ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively; standard errors of each coefficient are in parentheses. Source: Authors' calculation.

6. CONCLUSION

Bank lending plays a pivotal role in economic development, yet its relationship with institutional factors like competition and economic freedom remains complex. This study examined these dynamics across 214 countries from 1993 to 2017, employing system-GMM to address endogeneity concerns in panel data analysis. Our analysis reveals three key findings: First, both bank competition and economic freedom independently constrain credit provision, suggesting these factors may initially tighten lending conditions. Second, and more significantly, their interaction produces divergent outcomes, stimulating lending in high-income economies while suppressing it in developing nations. Third, robust tests confirm these patterns hold when examining financial/business freedom components separately. These findings carry important implications. For policymakers, they underscore that economic freedom requires complementary institutional development, especially in tailoring reforms to the income level and institutional capacity of each country. Uniform financial sector reforms may backfire in less prepared economies. For bank managers, particularly in emerging markets, the results highlight the importance of strengthening operational efficiency and risk management frameworks before market liberalization. Moreover, given that intense banking competition may reduce credit distribution, managers should consider strategic responses, such as competitive loan pricing, to remain viable. Liberalization also presents opportunities to expand customer bases, which bank

managers in developing countries should be prepared to capture through adaptive strategies.

There are several limitations that warrant mentioning. The study's pre-2017 timeframe excludes recent disruptions like COVID-19 and geopolitical conflicts. Our competition measures, while standard, may not capture digital-era banking dynamics. Additionally, the analysis focuses on credit volume rather than quality. Then, this research uses country-level data, not specifically at the company level.

Future research should: 1) investigate nonlinear thresholds where competition-freedom interactions turn beneficial; 2) examine how digital transformation moderates these relationships; 3) incorporate credit risk metrics to assess stability implications. Comparative case studies of policy approaches in different income groups could yield practical insights for regulatory design; 4) further research can investigate in more depth by looking at the types of bank lending at the company level and the types of credit distribution.

This study advances financial economics literature by demonstrating how institutional contexts reshape the competition-lending nexus, offering a more nuanced framework for evaluating financial sector reforms globally. These results have implications for policymakers and managers. For policymakers, it is crucial to assess a bank's readiness to face open competition, particularly in developing countries. Economic openness policies offer significant potential for further developing the financial system. Managers must develop strategies to seize growth opportunities when countries implement economic openness policies.

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