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Nexus between Economic Freedom and Bank Risk-Taking: Evidence from US Commercial Banks

Summary: Using the two-stage generalized linear modelling (GMM) technique, we examine the connection between economic freedom and its constituents and bank risk-taking in the US. The findings indicate that bank risk-taking restrictions are caused by restrictions on property rights, government honesty and accountability, government expenditure and taxation, and monetary, commercial, and financial independence. But financial institutions benefit from taking more chances when they are free to trade and invest anywhere, they like. The risk of well-capitalized banks is reduced by economic freedom while the danger of undercapitalized banks is increased. Banks with enough capitalization benefit more from economic freedom and its component than do those with insufficient capital. According to the data, risk management contributes more to good governance than any other factor. The findings hold up across different risk metrics and sample sizes. Our findings have ramifications for monetary liberty and the willingness of commercial banks to take risks.

Keywords: Economic freedom, Bank risk, US commercial banks.

JEL: G21, G28.

Economic freedom is all about one's fundamental right to control their work, production, wealth, and consumption. More specifically, economic freedom is about the degree to which a market economy is in place. Three main factors which define economic freedom include the degree of voluntary exchange, free competition, and protection of persons and property. Societies having high scores regarding economic freedom are also relatively more prosperous in terms of social and economic goals (Hugo J. Faria and Hugo M. Montesinos 2009), i.e., healthier, wealthier, cleaner, and more informed. We may say that the characteristics of the societies on different places in the economic freedom index differ. Therefore, different organizations which work in different societies based on the freedom index face different challenges and opportunities, so they behave differently.

Banks are the backbone of economic systems in the current capitalist system. They help to transfer the funds from surplus economic units to deficit units having the opportunity to invest. In this process of transferring funds, they take risk due to the short-term nature of deposits and long-term nature of loans. Banks profit from this maturity transformation by paying less return to the depositors and charging higher

returns from borrowers. The greater the spread between the two values, higher the return, which entices banks to take higher risk, i.e., lending to the riskiest borrowers at a relatively high interest rate, which results in higher risk for the banks. The global financial crisis of 2007-2008 has highlighted the adverse impact of banks' excessive risk taking. Therefore, proper regulation of banks is very important. On the other hand, tight regulation slows down the maturity transformation process, which has a significant cost for society. Therefore, it is very important to have a fine balance between the freedom and regulation of banks.

Several studies have analyzed the role of economic freedom on the various aspects of banks performance and efficiency. However, the influence of various economic freedom index indicators on bank risk-taking activity is missing for US banks. To bridge the above-mentioned gap in the literature, we examine the effect of economic freedom and its components on US bank risk-taking. The study addresses the following issues. Are economic freedom and its components essential to bank risk-taking? Does the impact of economic freedom's component is symmetrical on banks risk taking? Does the impact of economic freedom and its' subcomponent on bank risk differ across well-capitalized and undercapitalized commercial banks? The structure of the study is as follows.

1. Literature Review

1.1 Theoretical Framework

The relationship between risk-taking and economic freedom is not straightforward. On one side, the lower restrictions on economic activities and relaxed regulations James R. Barth, Gerard Caprio, and Ross Levine (2004) for banking activities may induce excessive risks to secure higher profits (Faria and Montesinos 2009). The overall economic freedom index is comprised of several subcomponents. The study explains the role of an individual component in influencing the risk-taking of commercial banks. Monetary freedom shows the control of the government on interest rates, prices, and currency fluctuation. For example, a more extended period of low-interest margin may motivate a financial organization to take on risky projects to meet the cost of operations (Claudio Borio and Haibin Zhu 2012). With stable interest rates, investors can create an effective plan for saving and investing. Risk-taking and market freedom are crucial in the entire process of excessive competitiveness, which may lead to excessive risk-taking in the long run. Relaxation of business activities increases competition and leads to a reduction in profit margins on comparable prices. By this, banks funnel higher funds at loose credit programs, which pose a risk (Barth, Caprio, and Levine 2004).

One of the claims in the literature explores that unnecessary government restrictions harm creative goods and service activities. Because of this, earnings fall, and banks take undue risk to cover losses. A sound financial framework offers credit to entities and improves service efficiency and payment satisfaction for stakeholders. Spending freedom exposes economic incentives and promotes greater investment, adding to the risks. The reduced tax burden enhances lenders' willingness to pay, reducing defaults. Government spending often raises incentives, adding to the risks. Government laws remain essential for controlling economic development practices and

protecting stakeholders. The common courtesy of government integrity, governance, and property rights prevents complete dishonesty and illegal operations. Higher integrity, good governance, and security of property rights inspire innovation, thus improving economic and financial activities (Rafik Harkati, Syed Musa Alhabshi, and Salina Kassim 2019).

In contrast, the negative relationship between economic freedom and banks' willingness to take risks is also attractive in several ways. As the economy as a whole expands, new commercial opportunities emerge. Profits tend to rise in line with economic growth, which is reflected in improved business prospects. This reduces the likelihood that the borrower will be unable to make repayments. Second, better surveillance and market discipline increase financial institutions' vigilance against their illegal operations. Third, according to the risk aversion concept, banks may want to improve their profits at a lower or comparable level of risk. Due to strict regulations, new companies have limited access to the financial industry, exacerbating the monopoly problem. The consequences of a monopoly remain unfavourable for economic growth.

1.2 Related Literature

Different aspects of economic freedom have been explored in recent literature to examine their impact on various economic and financial proxies. Numerous studies have used economic freedom and its subcomponents as independent and control variables, drawing conclusions about the relationships between its various aspects and a variety of financial and economic variables in recent years (Michael D. Stroup 2007; Mogens K. Justesen 2008). In the specific context of the banking industry, the literature is limited. However, the following studies recently provide some empirical evidence. Studies explore the impact of economic freedom on bank performance include (Fadzlan Sufian and Muzafar Shah Habibullah 2010). The relationship between risk and economic freedom becomes essential in the post-crisis period. Harkati, Alhabshi, and Kassim (2019) recently examined the influence of economic freedom on bank behaviour of risk-taking in the dual banking system. In order to better understand how investment, financial, and trade flexibility affect commercial banks' willingness to take risks, Faisal Abbas, Noshaba Batool, and Fiaz Ahmad Sulehri (2020) carried out a study. According to the study, commercial banks take less risk when they have financial independence but more risk when they have investment and trade flexibility. The researchers conclude a significant and negative relationship between bank risk-taking and subcomponents of economic freedom. The results corroborate that the influence of economic freedom is more significant for Islamic banks than conventional organizations. Using information from MENA region banks, Saibal Ghosh (2016) looks into how economic freedom affects risk-taking. The study concludes that economic independence has a negative and significant impact on risk-taking. Using data from Sub-Saharan African nations, Emmanuel Sarpong-Kumankoma et al. (2020) figured out that the banking system's stability has a detrimental effect on the economy. The research also found that banks operating in a more financially liberal climate are likewise more hazardous.

The following research has contributed to the literature on account of the connection between economic and financial independence and bank risk taking. Using data from Malaysian institutions, Harkati, Alhabshi, and Kassim (2019) found that both Islamic and conventional banks fared poorly as a result of economic freedom. The mainstream banks were less impacted than their Islamic equivalents. In addition, Georgios E. Chortareas, Claudia Girardone, and Alexia Ventouri (2013) found that banks in countries with greater financial freedom are more productive. The authors also found that the strength of the correlation between the aforementioned factors increased with the degree of economic freedom in the country.

Borio and Zhu (2012) find that lower lending interest rates may encourage banks to take more risk. They claim that commercial banks' yields are lowered by low-interest margins, which could encourage them to take more risks. Risk-taking could be affected by the presence of legal norms and regulations, as proposed by Simeon Djankov et al. (2003). Bank risk-taking and capital may have a countervailing effect, according to research by Daesik Kim and Anthony M. Santomero (1988). In this light, they contend that even in the event of increased economic freedom, banks with larger capital ratios may not expand their risk-taking due to risk-averse behaviour. Patrick Honohan (1997) points out, if banks allow excessive lending, regulators may implement limits to slow credit expansion. Increased economic independence may not necessarily result in more daring behaviour, as discussed above.

In the context of depositor protection, governments must provide a secure environment for deposited funds. For the depositors' protection, deposit insurance is used as a tool to reduce losses Reint Gropp and Jukka Vesala (2004) and Lucy Chernykh and Rebel A. Cole (2011). As a result, depositors limit the monitoring of the financial institutions due to the presence of deposit insurance Asli Demirgüç-Kunt and Harry Huizinga (2004). Barth, Caprio, and Levine (2004) opine that due to limited liability and lack of market monitoring, bank managers may take risky investments, which leads to an increase in the risk of banks on the cost of insurance. Demirgüç-Kunt and Huizinga (2004) explore that high economic freedom leads to a decrease in the interest margin of institutions.

Sufian and Habibullah (2010) on the other hand, discovered that economic freedom is correlated with Chinese bank profitability. Free markets, according to Maher Mohamad Hasan and Jemma Dridi (2010) spur innovation and lead to long-term economic prosperity. According to research by Sufian and Muhamed Zulkhibri (2011) a positive correlation between economic freedom and the performance of a sample of Islamic banks is discovered. Expectations of government intervention in financial markets to prevent monopoly and boost risk-taking, as argued by Xavier Freixas and Anthony M. Santomero (2004), lead banks to take more risk Lammertjan Dam and Michael Koetter (2012).

There are number of studies which analyze the relationship between economic freedom and bank performance. Sufian and Zulkhibri (2015) found that greater economic freedom positively affects the profitability of Islamic banks in the Middle Eastern and North Africa (MENA) region. The study concluded that lower intervention in the system increases Islamic banks' profitability. Peter Crabb (2008) extended the literature regarding studies of economic freedom and financial institutions to micro-

financial institutions. The study concluded that micro-finance institutions also perform better in countries with lesser government regulations and increased regulatory intervention lowers the sustainability of micro-finance banks. Daniel M. Gropper, John S. Jahera Jr., and Jung Chul Park (2015) also concluded that economic freedom is also positively associated with economic freedom and the political connections result in enhanced performance. Political connections matter more for states where economic freedom is less and *vice versa*. There are many existing studies that have explored another dimension of economic freedom. They have studied the impact of economic freedom on the economic performance of different countries. Fredrik Carlsson and Susanna Lundström (2002) found a positive relationship between economic

freedom and economic growth and economic freedom seriously matters for economic growth. Chris Doucouliagos and Mehmet Ali Ulubasoglu (2006) did a meta-analysis of the literature and also found a positive relationship between economic freedom and economic growth. The study also identified a positive relationship between economic freedom and economic growth through the stimulation of physical capital. Congsheng Wu (2011) studied the relationship between economic freedom and economic growth for the economy which grew at a pace much faster than many other countries i.e. China. The study contradicted the persistent positive relationship between economic freedom and economic growth. Chinese economy grew at a rate of 10% per annum over the sample period despite having a very low rank in the economic freedom index. Claudia R. Williamson and Rachel L. Mathers (2011) highlighted the importance of economic freedom for economic growth by stating that economic freedom matters more for economic growth compared to culture. The study concluded that culture is important for growth in the absence of economic freedom. James D. Gwartney, Robert A Lawson, and Randall G. Holcombe (1999) also confirmed the positive relationship between economic freedom and economic growth. The results are robust even by taking into consideration human, physical capital, and demographics. Jakob De Haan and Jan-Egbert Sturm (2000) studied various indicators of economic growth and concluded that greater economic freedom enhances economic growth. There seems to be a consensus amongst the researchers that a positive relationship exists between economic freedom and economic growth.

2. Research Methodology

2.1 Data

The data for this is taken from multiple sources. First, the consolidated financial statements of banks in the United States are used as a source for this study's data collection. The information was gathered from the Federal Deposit Insurance Corporation (FDIC 2020)[1] over the time period extending from 2003 to 2019. Second, the data for economic freedom and its components is derived from Heritage Foundation website, similar to (Ghosh 2016; Harkati, Alhabshi, and Kassim 2019; François-Eric Racicot et al. 2019). The Heritage Foundation Index highlights those policy variables which are under the control of the government. Finally, the data for macroeconomic variables was

[1] **Federal Deposit Insurance Corporation.** 2020. https://www.fdic.gov/ (accessed march 20, 2020).

collected from the world indicators database (Raghuram Rajan and Luigi Zingales 1998).

There are several reasons for studying time horizon. First, it includes several economic boom and busts, including the GFC. Secondly, globalization has increased the significance and volume of the banking business more than ever before, which amplifies the fragility of the banking sector. Therefore, the management of the financial system remains a primary focus for regulators, analysts, investors, bankers, governments, and economists during this era. In this period, the FDIC directed banks to report their half-year financial statements as a regulatory requirement. Therefore, commercial banks have been reporting their financial information in similar formats throughout this period. As scholars, we think that this period is the basis for moving forward to a robust and stable economic system with the help of the financial industry. This study is a first step to going ahead.

The following types of financial institutions and organizations are not included in the sample: investment banks, savings banks, securities centers, real estate and mortgage banks, specialized government credit banks, and non-credit organizations. Only large commercial banks are included in the study in order to eliminate the possibility of bias caused by inconsistencies, reporting disparities, duplicate counting, operational variances, and differences in rules. The study will investigate and scrutinize each of the participating banks. On the 31st of December 2019, the FDIC reported that there were more than 1800 banks that qualified as big banks on the 31st of December 2019. The sample selection is based on the following criteria: First, a bank must have an active status according to the FDIC portal. Second, the bank must have a life that is longer than the time period being studied. Third, there haven't been any missing values at the bank for over two years. Fourth, the financial institution has been profitable for the past two years in a row. On or before the 31st of December in 2019, the bank shall not fall into the category of being considerably undercapitalized. Based on the criteria above, only 931 banks were chosen to contain 14896 yearly observations.

Keeping in mind the significance of banks' specific characteristics, we divided the banks into well-capitalized and undercapitalized banks based on their regulatory ratios. The regulators suggest banks maintain an 8% capital ratio against total risk-weighted assets. Banks having a ratio higher than 10% are categorized as well-capitalized, while banks having a capital ratio of less than 8% against risk-weighted assets are considered undercapitalized banks. Banks having a ratio lower than 6% against risk-weighted assets are considered significantly undercapitalized (Raj Aggarwal and Kevin Jacques 1998). In a similar vein, banks are divided into high and low liquid based on their liquid ratios. The banks' liquid ratios are above the mean, with high liquid categories (Mohammad Bitar, Kuntara Pukthuanthong, and Thomas Walker 2018; Abbas, Shoaib Ali, and Ghulame Rubbaniy 2021; Abbas et al. 2021).

Bank risk, total capital ratio, profitability, loan ratio, liquidity ratio, managerial efficiency and bank size measurement and scope is in line with (Ali, Syed Zulfiqar Ali Shah, and Summaya Chughtai 2019; Harkati, Alhabshi, and Kassim 2019; Imran Yousaf, Shoaib Ali, and Arshad Hasan 2019a, b; Rubbaniy et al. 2023). The definitions and symbols of variables used in the study are reported in Table 1.

Table 1 Variables Measurements

Variable	Measurements	Mean	Std.dev.
Bank risk	Risk-weighted assets/total assets	0.72	0.11
Capital ratio	Total equity/total assets	0.1	0.08
Profitability	Net income/total assets	0.01	0.05
Loan ratio	Net loans/total assets	0.67	0.13
Liquidity	Liquid assets/total assets	0.05	0.07
Managerial efficiency	Wages & salaries/total assets	0.02	0.05
Bank size	Log of total assets	13.6	0.9
World governance	World governance index	7.69	0.26
Economic freedom	Economic freedom index	77.69	2.11
Property rights freedom	Property rights index	85.18	4.29
Government Integrity	Government integrity index	74.18	2.25
Tax burden	Tax burden index	67.02	1.95
Government spending	Government spending index	56.82	5.2
Business Freedom	Business freedom index	88.4	3.13
Monetary freedom	Monetary freedom index	80.73	3.3
Trade freedom	Trade freedom index	84.99	2.11
Investment Freedom	Investment freedom index	73.84	5.09
Financial freedom	Financial freedom index	78.25	7.65

Source: Authors' calculations.

Overall economic freedom is concerned with the fundamental right of society to use and control its resources at its own will. The sub-components are categorized based on the various activities. For instance, property rights, government integrity, and judicial effectiveness represent the rule of law, which has a direct impact on businesses of all kinds. Government spending and the tax burden are inextricably linked to business because an increase in government spending stimulates economic activity while an increase in tax burdens depresses economic activity. Business and monetary freedom represent the efficiency of regulations. The relaxation of trade, investment, and financial freedom means that you can trade, invest, lend, and borrow at your own discretion or under the conditions of fewer restrictions and bindings.

2.2 Empirical Model

The following model was employed to test the impact of economic freedom and its constituent parts on the level of risk-taking behaviour exhibited by large commercial banks in the United States throughout the 15-year period spanning 2003 to 2019.

$$Y_{i,t} = \alpha_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \beta_3 Z_{\mathrm{i,t}} + \varepsilon_{i,t}. \quad (1)$$

In Equation (1) $Y_{i,t}$ is bank risk, which is a dependent variable, $Y_{i,t-1}$ show the lagged value. The sign of i is cross-sections (banks), t represents the time which is a year. $X_{i,t}$ represents a matrix of the economic freedom and subcomponents of economic freedom, which are independent variables, and $Z_{i,t}$ represents control variables.

Arellano-Bond GMM approach

Estimating the value of Equation (1) through the use of a simple ordinary least square may give rise to a variety of mathematical challenges, including the following: To begin, it is assumed that variables $X_{i,t}$ describing economic freedom are indeed endogenous. These variables may be associated with the equation's error component because of the possible bidirectional causality between economic freedom and bank risk-taking (1). Second, while discussing the characteristics of banks, the term "time-invariant" refers to fixed effects in cross-sections. The error term, which includes both the unseen effects of the bank denoted by $v_{i,}$ and the errors introduced by individual observations continue to hold the fixed effects.

$$u_{i,t} = v_i + e_{i,t}. \tag{2}$$

Thirdly, the existence of the lagged value $Y_{i,t-1}$ promotes the problem of autocorrelations. Fourth, the data has a shorter time dimension and a higher number of cross-sections (N). To resolve the issue of fixed effects, we tried fixed effects instrumental estimations in the setting of two-stage least square (2SLS). We tried several instruments like cost-efficiency, financial development, gross domestic product, and inflation at different times. In the first stage results of 2SLS, we found that the instruments are weak and not the right choice to use. Due to this fact, the study uses Manuel Arellano and Stephen Bond (1991) GMM approach to proceed further. The use of difference GMM resolves the problem of fixed effects from Equation (1).

$$\Delta Y_{i,t} = \beta_1 \Delta Y_{i,t-1} + \beta_2 \Delta X_{i,t} + \beta_3 \Delta Z_{\mathrm{i,t}} + \Delta\varepsilon\,. \tag{3}$$

The above equation is transformed as follows:

$$\Delta y_{i,t} = \alpha \Delta y_{i,t-1} + \beta_2 \Delta x'_{i,t} + \Delta\varepsilon. \tag{4}$$

The transformation of the equation eliminates the fixed banks-specific aspect because it does not vary with time. With the use of Equation (2) we can express:

$$u_{i,t} = v_i + e_{i,t}$$

or

$$u_{i,t} - u_{i,t-1} = (v_i - v_{i-1)} + \left(e_{i,t} - e_{i,t-1}\right) = e_{i,t} - e_{i,t-1}\,.$$

In this instance, the dependent variable is used as an instrument together with its history *via* the first difference of the lag. We follow the advice of Arellano and Bond (1991) and take a position in favour of the argument, holding that a single-step approach is highly skewed. Instead of using a straightforward two- or one-step method, Frank Windmeijer (2005) suggested using robust standard errors. He thinks the system's two-stage estimator is more reliable and effective. GMM has been used in a number of banking-related investigations (Chien-Chiang Lee and Meng-Fen Hsieh 2013; Yong Tan 2016; Vuong Thao Tran, Chien-Ting Lin, and Hoa Nguyen 2016; Ali et al. 2022).

$$lnY_{i,t} = \phi Y_{i,t-1} + \beta X'_{i,t} + (\eta_i + \varepsilon_{i,t}). \tag{5}$$

3. Results and Discussion

Table 2 and Table 3 represent the findings for the overall sample and each table contains the chosen test's post-estimation statistics. Hansen test is used to verify the exogeneity of the instrument employed in the baseline model. In particular context of the US the findings are in line with the study of (Abbas, Batool, and Sulehri 2020). Theoretically, the results of this study are consistent with Ghosh (2016). However, there is a major variation in the effect of coefficients in the USA relative to previous literature

Table 2 Overall Banks Results-1

Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.721***	0.600***	0.469***	0.711***	0.673***	0.694***
	(0.076)	(0.082)	(0.068)	(0.071)	(0.061)	(0.13)
Economic freedom	-0.003**					
	(0.091)					
Govt. integrity		-0.004**				
		(0.002)				
World governance			-0.025***			
			(0.000)			
Property rights				-0.002**		
				(0.000)		
Tax burden.					-0.003*	
					(0.001)	
Business freedom						-0.002***
						(0.000)
Capital ratio	0.226***	0.268***	0.243***	0.232***	0.264***	0.216***
	(0.046)	(0.041)	(0.052)	(0.046)	(0.042)	(0.054)
Profitability	0.524***	0.834***	0.620***	0.570***	0.549***	0.546***
	(0.112)	(0.184)	(0.142)	(0.117)	(0.118)	(0.138)
Loan ratio	0.167**	0.299***	0.279***	0.175**	0.199***	-0.028
	(0.075)	(0.069)	(0.076)	(0.075)	(0.07)	(0.149)
Liquidity ratio	-0.464***	-0.402***	-0.409***	-0.456***	-0.418***	-0.569***
	(0.062)	(0.056)	(0.057)	(0.062)	(0.052)	(0.102)
Managerial efficiency	0.723*	1.379**	0.148	0.917*	0.479	1.124**
	(0.403)	(0.675)	(0.311)	(0.478)	(0.367)	(0.559)
Bank size	0.003	0.004**	0.006**	0.008	0.002*	0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Constant	0.229***	0.305***	0.369***	0.143***	0.193**	0.323***
	(0.083)	(0.107)	(0.079)	(0.051)	(0.084)	(0.082)
Observations	14,896	14,896	14,896	14,896	14,896	14,896
Number of id	931	931	931	931	931	931
AR (2)	0.225	0.185	0.519	0.21	0.249	0.199
Instruments	10	10	10	10	10	10
Hansen statistics	0.548	0.477	0.331	0.393	0.122	0.366

Notes: A two-step system GMM robust standard errors are reported where bank risk is the dependent variable and economic freedom, government integrity, world governance, property rights, tax burden, and business freedom are independent variables.

Source: Authors' calculations.

(Ghosh 2016; Harkati, Alhabshi, and Kassim 2019). The findings show that the impact of economic freedom and its components on bank risk-taking in Malaysia and the MENA region is stronger than that of US commercial banks. This result is not surprising, it was anticipated because the cause of disparity remains with business performance, careful management, cultural values, and investor understanding.

Table 3 Overall Banks Results-2

Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.714***	0.705***	0.651***	0.709***	0.994***
	(0.073)	(0.065)	(0.055)	(0.071)	(0.127)
Monetary freedom	-0.001**				
	(0.005)				
Trade freedom		0.015**			
		(0.006)			
Investment freedom			0.072**		
			(0.003)		
Financial freedom				-0.007**	
				(0.003)	
Govt. spending					-0.021**
					(0.008)
Capital ratio	0.239***	0.238***	0.266***	0.217***	0.150**
	(0.043)	(0.044)	(0.041)	(0.049)	(0.058)
Profitability	0.568***	0.660***	0.699***	0.597***	0.551***
	(0.116)	(0.132)	(0.144)	(0.121)	(0.123)
Loan ratio	0.198***	0.184***	0.214***	0.202***	-0.043
	(0.071)	(0.069)	(0.063)	(0.068)	(0.125)
Liquidity ratio	-0.445***	-0.444***	-0.410***	-0.456***	-0.637***
	(0.06)	(0.055)	(0.048)	(0.062)	(0.11)
Managerial efficiency	0.776*	0.784*	1.116**	0.518	1.011**
	(0.442)	(0.423)	(0.541)	(0.348)	(0.456)
Bank size	0.001	0.012	0.026**	0.001	-0.045*
	(0.002)	(0.014)	(0.012)	(0.017)	(0.027)
Constant	0.136***	-0.0709	-0.00735	0.125***	0.212***
	(0.049)	(0.051)	(0.031)	(0.044)	(0.079)
Observations	14,896	14,896	14,896	14,896	14,896
Number of id	931	931	931	931	931
AR (2)	0.181	0.18	0.288	0.25	0.201
Instruments	10	10	10	10	10
Hansen statistics	0.253	0.548	0.478	0.35	0.791

Notes: A two-step system GMM robust standard errors are reported where bank risk is the dependent variable and government spending, monetary, trade, investment, financial freedom are independent variables.

Source: Authors' calculations.

First, we provide the results of the entire sample and explain what they tell us. The results show a negative and significant correlation between economic liberty and risk-taking, this means that greater freedom of economic operation increases the borrower's payment potential, which contributes to lower default risk. With the right economic conditions, people can earn a decent income, and the repayment of loans

becomes easier. The findings are in line with (Ghosh 2016; Harkati, Alhabshi, and Kassim 2019). The effect of property rights, government integrity, governance, tax burden, government spending, business freedom, monetary and financial freedom, and risk-taking, similar to the findings of (Ghosh 2016; Harkati, Alhabshi, and Kassim 2019). Increasing corporate independence, increased financial needs, and high government spending all contribute to a greater demand for lending. Because of this, financial institutions compete for loan customers by offering competitive interest rates. Default risk decreases as a result of investors' decent earnings in this scenario as demonstrated by Sufian (2013). Investment and trade freedom increases the risk-taking behavior of the banks. Banks are more likely to take risks when there is less regulation on investments and commerce. Banks boost their risky lending to take advantage of investment and trade freedom (Elena Cubillas and Francisco González 2014), hence these policies contribute favourably to bank risk. Increasing economic freedom has a favourable effect on commercial banks' willingness to take risks, and this is reinforced by Justesen (2008). The analysis reveals that strong governance is more beneficial to reduce risk-taking than other components of economic freedom. The findings remain in line with the discussion of (Abbas, Batool, and Sulehri 2020) regarding the impact of financial, trade and investment freedom on risk-taking.

The use of control variables to mitigate portfolio risk is still crucial. The equation for the economic freedom index is shown in the first line of the explanation. Similar to what was found by Abbas et al. (2019), the lagged dependent coefficient is positive and statistically significant when it comes to influencing the present risk. Capital ratios that rise are consistent with the regulatory concept investigated by Yener Altunbas et al. (2007) and Terhi Jokipii and Alistair Milne (2011). These results are consistent with those of Abbas et al. (2019), who found that commercial bank risk rises when loan growth and profitability improve. Whereas, commercial banks are more likely to take chances with increased risk-taking and management efficiency as well as larger bank size.

Capitalization-based examination of US banks is shown in Tables 3 and 4. Based on the findings, economic freedom has a negative effect on bank risk. Even yet, the size is smaller than one would expect from the baseline model's predictions. The lower impact of overall economic freedom on portfolio risk shows that the well-capitalized banks' normal operations are at the optimal level, and the changes in economic activities are less influential in determining bank risk. Reduced risk for well-capitalized banks is a direct result of improvements in property rights, governance, government honesty, tax burden, government expenditure, business, monetary, and financial independence. The negative relationship demonstrates the robustness of Harkati, Alhabshi, and Kassim (2019). However, investment and trade freedom lead positively contribute to the risk of banks. However, the coefficient of the governance index is statistically significant and robust, which suggests that improvement in governance helps in reducing the risk-taking behavior of the banks.

Tables 5 and 6 represent the results of undercapitalized commercial banks. The findings show that, for undercapitalized banks, the effect of economic freedom and its

Table 4 Well Capitalized Banks Results-1

Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.800***	0.580***	0.617***	0.875***	0.788***	0.899***
	(0.217)	(0.145)	(0.16)	(0.186)	(0.0866)	(0.299)
Economic freedom	-0.004*					
	(0.002)					
Govt. integrity		-0.060**				
		(0.002)				
World governance			-0.0073**			
			(0.000)			
Property rights				-0.003**		
				(0.001)		
Tax burden.					-0.005**	
					(0.000)	
Business freedom						-0.004**
						(0.000)
Capital ratio	0.263*	0.484***	0.293**	0.268**	0.380***	0.474***
	(0.142)	(0.108)	(0.143)	(0.121)	(0.0812)	(0.112)
Profitability	0.411	0.576*	1.116**	0.569**	0.445*	0.345
	(0.254)	(0.313)	(0.43)	(0.265)	(0.236)	(0.32)
Loan ratio	0.0547	0.274*	0.370**	0.0594	0.113	-0.113
	(0.197)	(0.161)	(0.155)	(0.174)	(0.0867)	(0.345)
Liquidity ratio	-0.419***	-0.279***	-0.298***	-0.428***	-0.339***	-0.470**
	(0.141)	(0.101)	(0.104)	(0.123)	(0.0629)	(0.199)
Managerial efficiency	0.62	0.337	2.871*	1.992	0.212	2.285
	(1.085)	(0.923)	(1.615)	(1.428)	(1.009)	(1.621)
Bank size	-0.003	0.002	0.004	-0.001	-0.003	0.001
	(0.003)	(0.003)	(0.004)	(0.003)	(0.002)	(0.004)
Constant	0.355*	0.491**	0.452*	0.211**	0.285**	0.328*
	(0.201)	(0.208)	(0.23)	(0.0973)	(0.12)	(0.187)
Observations	3,920	3,920	3,920	3,920	3,920	3,920
Number of id	245	245	245	245	245	245
AR (2)	0.857	0.958	0.632	0.832	0.843	0.935
Instruments	10	10	10	10	10	10
Hansen statistics	0.14	0.07	0.398	0.798	0.218	0.678

Notes: A two-step system GMM robust standard errors are reported where bank risk is the dependent variable and economic freedom, government integrity, world governance, property rights, tax burden, and business freedom are independent variables.

Source: Authors' calculations.

subcomponents is not identical to well-capitalized banks. The results of the study prove that economic freedom, along with its subcomponents is more influential for the risk-taking potential of well-capitalized commercial banks than those of undercapitalized banks. The results show that economic freedom and bank risk are negatively related, which is in line with the findings of (Ghosh 2016). The coefficient explains that in some of the cases, impact remains more significant to influence the undercapitalized bank's risk. The simple reason is that higher freedom leads to an increase in the business of undercapitalized banks, which leads to a positive change in profits in a higher proportion than the increase in marginal risk.

Table 5 Well Capitalized Banks Results-2

Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.891***	0.844***	0.743***	0.875***	0.868***
	(0.193)	(0.195)	(0.152)	(0.188)	(0.204)
Monetary freedom	-0.002**				
	(0.001)				
Trade freedom		0.030*			
		(0.002)			
Investment freedom			0.002**		
			(0.001)		
Financial freedom				-0.012**	
				(0.001)	
Govt. spending					-0.002*
					(0.002)
Capital ratio	0.222	0.294**	0.367***	0.207	0.215*
	(0.135)	(0.131)	(0.0976)	(0.14)	(0.123)
Profitability	0.572**	0.602**	0.858**	0.564**	0.490*
	(0.266)	(0.281)	(0.336)	(0.272)	(0.279)
Loan ratio	0.0858	0.0864	0.148	0.0915	0.0957
	(0.17)	(0.185)	(0.148)	(0.169)	(0.209)
Liquidity ratio	-0.433***	-0.385***	-0.338***	-0.452***	-0.459***
	(0.125)	(0.127)	(0.0968)	(0.13)	(0.171)
Managerial efficiency	1.72	0.972	2.981*	0.928	1.094
	(1.315)	(1.22)	(1.765)	(1.059)	(0.952)
Bank size	-0.002	-0.001	0.004	-0.004	-0.003
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Constant	0.243**	-0.197	-0.174	0.218**	0.251
	(0.108)	(0.141)	(0.106)	(0.1)	(0.166)
Observations	3,920	3,920	3,920	3,920	3,920
Number of id	245	245	245	245	245
AR (2)	0.893	0.966	0.951	0.877	0.945
Instruments	10	10	10	10	10
Hansen statistics	0.949	0.125	0.734	0.728	0.86

Notes: A two-step system GMM robust standard errors are reported where bank risk is the dependent variable and government spending, monetary, trade, investment, financial freedom are independent variables.

Source: Authors' calculations.

Table 6 Undercapitalized Banks Results-1

Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.884***	0.504***	0.567***	0.866***	0.658***	0.472***
	(0.054)	(0.078)	(0.092)	(0.051)	(0.053)	(0.051)
Economic freedom	-0.024***					
	(0.008)					
Govt. integrity		-0.024**				
		(0.001)				
World governance			-0.009			
			(0.000)			
Property rights				-0.003**		
				(0.001)		

Tax burden					-0.008	
					(0.001)	
Business freedom						0.003*
						(0.017)
Capital ratio	0.258***	0.402***	0.383***	0.274***	0.361***	0.423***
	(0.049)	(0.055)	(0.061)	(0.047)	(0.042)	(0.049)
Profitability	0.613***	0.888***	0.850***	0.679***	0.687***	0.707***
	(0.126)	(0.15)	(0.196)	(0.13)	(0.127)	(0.137)
Loan ratio	0.0405	0.186**	0.266***	0.0341	0.198***	0.319***
	(0.055)	(0.087)	(0.069)	(0.056)	(0.067)	(0.058)
Liquidity ratio	-0.584***	-0.485***	-0.428***	-0.587***	-0.451***	-0.368***
	(0.052)	(0.067)	(0.065)	(0.054)	(0.053)	(0.045)
Managerial efficiency	0.598*	-0.274	0.34	0.806*	0.159	-0.706**
	(0.353)	(0.319)	(0.819)	(0.432)	(0.334)	(0.303)
Bank size	-0.003**	-0.001	0.008	-0.003**	-0.009	0.002
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.271***	0.423***	0.247**	0.188***	0.195**	0.107***
	(0.074)	(0.086)	(0.119)	(0.049)	(0.084)	(0.034)
Observations	10,911	10,911	10,911	10,911	10,911	10,911
Number of id	682	682	682	682	682	682
AR (2)	0.73	0.106	0.054	0.064	0.054	0.93
Instruments	10	10	10	10	10	10
Hansen statistics	0.279	0.294	0.083	0.167	0.946	0.286

Notes: A two-step system GMM robust standard errors are reported where bank risk is the dependent variable and economic freedom, government integrity, world governance, property rights, tax burden, and business freedom are independent variables.

Source: Authors' calculations.

The relationships of economic activities and portfolio risk for undercapitalized banks have economic significance for regulators and government policymakers. Furthermore, results reveal that property rights, governance, government spending, monetary, and financial freedom negatively affect the risk of undercapitalized banks, findings are in line with (Ghosh 2016; Harkati, Alhabshi, and Kassim 2019). The link between trade and business freedom is positive with portfolio risk, as reported by Elena Cubillas and González (2014) in some cases in his study. However, the investment, government integrity, and tax burden are not conclusive to influence the risk-taking of undercapitalized commercial banks in the USA. There are several justifications for disagreement in the results of two extremes. The undercapitalized banks remain under stress due to extra monitoring and supervision by regulatory authorities. Monetary policy stability leads to a decrease in the risk of undercapitalized banks. Undercapitalized banks remain less diversified in generating revenues. The primary dependence of undercapitalized banks is on loans, and the stability in monetary policy leads to the selection of a diversified portfolio.

Table 7 Undercapitalized Banks Results-2

Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.869***	0.874***	0.637***	0.858***	1.084***
	(0.054)	(0.051)	(0.051)	(0.049)	(0.167)
Monetary freedom	-0.001**				
	(0.004)				
Trade freedom		0.006***			
		(0.000)			
Investment freedom			0.002		
			(0.002)		
Financial freedom				-0.007**	
				(0.002)	
Govt. spending					-0.002*
					(0.001)
Capital ratio	0.270***	0.277***	0.369***	0.246***	0.177**
	(0.051)	(0.045)	(0.042)	(0.054)	(0.09)
Profitability	0.654***	0.806***	0.734***	0.687***	0.653***
	(0.128)	(0.143)	(0.152)	(0.13)	(0.147)
Loan ratio	0.062	0.042	0.223***	0.073	-0.138
	(0.053)	(0.053)	(0.064)	(0.05)	(0.161)
Liquidity ratio	-0.569***	-0.579***	-0.432***	-0.580***	-0.747***
	(0.053)	(0.049)	(0.051)	(0.052)	(0.148)
Managerial efficiency	0.598	0.839**	0.225	0.44	1.044*
	(0.413)	(0.395)	(0.455)	(0.325)	(0.56)
Bank size	-0.002**	-0.003**	0.002	-0.003**	-0.006**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Constant	0.163***	-0.0619	0.0696**	0.152***	0.230**
	(0.046)	(0.054)	(0.029)	(0.037)	(0.091)
Observations	10,911	10,911	10,911	10,911	10,911
Number of id	682	682	682	682	682
AR (2)	0.06	0.054	0.058	0.074	0.091
Instruments	12	12	10	10	10
Hansen statistics	0.068	0.545	0.302	0.148	0.654

Notes: A two-step system GMM robust standard errors are reported where bank risk is the dependent variable and government spending, monetary, trade, investment, financial freedom are independent variables.

Source: Authors' calculations.

3.1 Robustness Check

To ensure the validity and consistency of our results, we have run a battery of tests and performed many splits of the sample. Alternative risk ratios such as Gross Loans to Total Assets (GLTA), Loan Loss Provision to Total Assets (LLPTA), Net Charge-Off to Total Assets (NCOTA), and Loan Loss Provision to Gross Loans (LLPGL) are tested using the first option (Loan Loss Provisions to Gross loans). In the first experiment, we used GLTA instead of BR (Bank Risk=Risk-weighted Assets to Total Assets) and found that the estimators' signs and significances were very comparable, with only a few exceptions (see Table 8, Panel A). The sample is then divided into even more categories so that we can test the stability of our findings. In order to avoid

Table 8 Robustness Check

Panel-A	**Overall sample**					
Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.734***	0.414***	0.667***	0.762***	0.854***	0.772***
	(0.044)	(0.068)	(0.082)	(0.041)	(0.063)	(0.031)
Economic freedom	-0.003***					
	(0.001)					
World governance		-0.044**				
		(0.019)				
Govt. spending			-0.003			
			(0.002)			
Property rights				-0.002**		
				(0.004)		
Tax burden					-0.001	
					(0.001)	
Business freedom						0.003*
						(0.002)
Panel-B	**Significantly undercapitalized bank**					
Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.584***	0.404***	0.467***	0.766***	0.558***	0.372***
	(0.054)	(0.078)	(0.092)	(0.051)	(0.053)	(0.051)
Economic freedom	-0.004***					
	(0.008)					
World governance		-0.054**				
		(0.002)				
Govt. spending			-0.003			
			(0.059)			
Property rights				-0.063**		
				(0.067)		
Tax burden					-0.054	
					(0.007)	
Business freedom						0.023*
						(0.057)
Panel-C	**High liquid banks**					
Variables	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk	Bank risk
L. bank risk	0.484***	0.604***	0.767***	0.646***	0.651***	0.571***
	(0.044)	(0.088)	(0.062)	(0.041)	(0.063)	(0.061)
Economic freedom	-0.003***					
	(0.005)					
World governance		-0.024**				
		(0.001)				
Govt. spending			-0.008			
			(0.079)			
Property rights				-0.014**		
				(0.027)		
Tax burden					-0.014	
					(0.002)	
Business freedom						0.043*
						(0.017)

Notes: A two-step system GMM robust standard errors are reported where bank risk is the dependent variable and world governance, government integrity, property rights, tax burden, economic, and business freedom are independent variables.

Source: Authors' calculations.

cluttering the page, we have only given the coefficient findings for highly liquid banks (banks are categorized according to the index of their liquid assets). For a breakdown of high and low liquid banks, as well as banks with dangerously low levels of capitalization (defined as a risk-based capital ratio of less than 6%, as shown in Table 8, Panel C), we rank the institutions according to the liquidity ratio index (see Table 8, Panel B). The results strengthen faith that, barring extremely unlikely circumstances, results will hold steady with the sign and significance of the coefficient.

4. Conclusion and Recommendations

Using the two-stage generalized linear modelling (GMM) technique, this research examines the connection between economic freedom and its constituents and bank risk-taking in the United States from 2003 to 2019. The results show that economic freedom and its constituents have a major and meaningful role in affecting the portfolio risk of banks. The results indicate that various elements of economic freedom account for various forms of risk-taking on the part of bank portfolios. The study finds that commercial banks in the United States are safer when economic freedom is strong. When looking at the data as a whole, we find that commercial banks are safer in countries with greater freedom of property rights, government integrity, governance, tax load, government spending, monetary freedom, and freedom to start and run businesses. Conversely, a larger shift in trade and investment freedom enhances risk-taking, and these results hold true across subsamples of both well and undercapitalized US banks.

The impact of good governance on risk reduction is greater than other components. The effect of economic freedom and its subcomponents differs between well-capitalized and undercapitalized banks. The results show heterogeneous outcomes for well-capitalized and undercapitalized commercial banks between risk appetite and economic freedom, which requires significant intention for further regulation and recommendations. Freedom of investment contributes significantly to the increased risk of well-capitalized banks, but has no influence on the risk of undercapitalized banks. Investment freedom reduces the risk of well-capitalized banks and increases the risk of undercapitalized banks. However, the governance indicator remains equally significant and similar for well-capitalized and undercapitalized banks.

The study suggests that by improving governance in commercial banks, managers can reduce portfolio risk. The differences between the components of economic freedom that influence the risk taking of well-capitalized and undercapitalized banks are critical to the development of new policies and policy implications. The results highlight valuable information for regulators to formulate an appropriate risk mitigation model to stabilize financial institutions. Finally, this suggests that the role of government involvement in economic activities affects the portfolio risk of financial institutions. The distinguishing characteristics and meaning of the control variables are also essential for the representation of economic independence.

Our study is further limited to the analysis of large commercial banks, which limits the generalizability of the study's results. Further studies could be conducted for all banks operating in the United States. In addition, new investigations may be conducted for investment banks, savings banks, and chartered and non-chartered banks in the United States. Furthermore, scholars can examine the relationship between economic freedom and risk under economic policy uncertainty and competition for the other regions of the world to reach informed conclusions.

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