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IMPACT OF INVESTMENT, FINANCIAL AND TRADE FREEDOM ON BANK'S RISK-TAKING

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Abstract:

This study explores the impact of investment, financial, and trade freedom on banks' risk-taking and stability of US banks by employing two-step system GMM approach over the extended period from 2002 to 2018. The findings provide evidence that financial freedom decreases risk-taking, while investment and trade freedom increase US larger banks' risk-taking. The results show that investment and trade freedom is beneficial for the stability of banks in the US. The heterogeneity in results indicates that financial freedom reduces the risk-taking, whereas trade and investment freedom increase the risk-taking of well-capitalized and high liquid banks. In contrast, in the case of undercapitalized and low liquid banks, the impact of financial, trade, and investment freedom on risk-taking is insignificant. The result demonstrates that the government's intervention is decisive in developing the degree of economic freedom for the financial system's stability. The finding of the study has practical implications for banks manager, regulators, and policymakers.

Key words: *Bank Portfolio Risk, Financial Freedom, Investment Freedom, and Trade Freedom*

1. Introduction

Since the beginning of the 21st century, banking industries have experienced a significant transition on consolidation, privatization, and financial integration due to globalization attributed to increased risk-taking by financial institutions, especially in the United States. Under the lower restrictions, financial institutions increase their risk-taking to secure higher returns. Thus, it has a positive effect on economic growth (Ghosh, 2016). Financial freedom is an ideal banking business environment that has minimum government intervention for financial transactions. The banks are free to provide credit, accept deposits, make contractual obligations, and deal in foreign transactions, encouraging banks to take more risk to increase their market share and profits. Whereas trade freedom increases investment and movements of business activities within and out of the state, enhancing competition among financial institutions. Which ultimately affect the risk-taking of financial institutions. The more significant trade in the shape of imports and exports increases the demand for financial services by financial institutions. To the fulfillment of

importer and exporter, financial needs increase the risk-taking of financial institutions. So for the economic freedom theory favor the high risk-taking due to the economic freedom environment as argued by (Barth, Caprio, & Levine, 2004; Borio & Zhu, 2012; Sufian & Habibullah, 2010; Sundararajan & Errico, 2002). In contrast, the more significant influence of government regulations on credit allocation, restriction on the flow of investment, access to foreign exchange, trade tariff for import and exports, financial and market development, and openness to foreign competitions lead to decrease risk (Ghosh, 2016; Harkati, Alhabshi, & Kassim, 2019; Jacques & Nigro, 1997).

In the literature, several studies have investigated the impact of economic freedom on banks' performance (Sufian and Habibullah, 2010), foreign direct investment Bengoa and Sanchez-(Robles,2003), corruption (Pieroni and d'Agostino, 2013), economic performance (Gwartney, 2009), and growth (Powell, 2002). The literature lacks studies for the impact of investment trade and financial freedom on bank risk-taking and stability in the US. There are only two studies that incorporated the interrelationship between bank risk-taking and economic freedom, one for the MENA region (Ghosh, 2016) and the other for Malaysia (Harkati et al., 2019). However, not a single study has examined the impact of economic, financial, and trade freedom on banks portfolio risk is unexplored in the US context. So this study will address this gap in the literature. This research analyzes the influence of financial freedom, investment freedom, and trade freedom on risk-taking and stability of large insured commercial banks in the USA. In particular, this study addresses the following questions. First, what is the influence of financial, investment, and trade freedom on the bank's risk-taking and stability? Does the relationship differ in the case of well-capitalized, under-capitalized, high liquid, and low-liquid insured commercial banks? Do well-capitalized banks influence differently than under-capitalized commercial banks? Do high liquid banks influence differently than low liquid banks?

This study contributes to the literature in different manners. This is the first study that explores the influence of investment, financial, and trade freedom on the risk-taking and stability of large commercial banks in the USA. This study extends the analysis to include well-capitalized, under-capitalized, high liquid, and low liquid banks to understand and get better in-depth insights. The outcomes of this research have economic significance for regulators and legislators. In light of the empirical evidence, the regulators, decision-makers, analysts, and bank managers may formulate appropriate guidelines for the financial system's stability. The results suggest that regulators and policy originators consider the role of investment, financial, and trade freedom to influence risk-taking and stability while developing risk mitigation guidelines. The results of this study highlight that government interventions on business and economic activities have a significant impact on a bank's risk-taking and stability of banks. This study complements the literature to fill the gap by using a novel data set of large insured commercial banks of the USA for an extended period ranging from 2002 to 2018. The study considers component-wise proxies apart from considering the overall economic freedom index aggregation to seek the real story.

The rest of the study contains the following parts: The second part corroborates the relevant literature. The third section contains data collection sources and econometric

model specifications. Forth part provides the results and discussion. A final section is about conclusions and future recommendations.

2. Literature Review and Hypotheses

In the last decade, recent literature has applied economic freedom components to explore their impact on various financial and economic proxies. In recent years, a wide variety of researchers have used economic freedom to conclude inferences between the economic freedom elements and many economic and financial variables (Hafer, 2013; Justesen, 2008; Pieroni & d'Agostino, 2013; Stroup, 2007). Recently published studies have used economic freedom and its sub-components as independent and control variables in financial-economic matters (Hartarska & Nadolnyak, 2007; Jones & Stroup, 2010; Roychoudhury & Lawson, 2010). In the particular background of the banking sector, there is minimal literature. Recently, however, the following findings include some of the observational results. The research explores the impact of economic freedom on banks' performance, including (Mamatzakis, 2013; Shahabadi & Samari, 2013; Sufian, 2013, 2014; Sufian & Habibullah, 2010). In the post-crisis era, the relationship between risk and economic freedom has become critical. Harkati et al. (2019) has studied the effect of economic freedom on bank risk-taking activity in the dual banking structure. Researchers argue that there is a significant and detrimental association between bank risk-taking and economic freedom sub-components. Ghosh (2016), Investigate the effect of economic freedom on risk-taking by utilizing data from MENA financial institutions. The analysis concludes that the impact of economic freedom on risk-taking is negative and significant.

Borio and Zhu (2012) research the relationship between monetary policy and banking risk-taking. They pointed out that lower lending interest rates could push banks to raise their risk. They claim that a low-interest margin limits commercial banks' profit, convincing them to take higher risk. Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) argue that legislation provides substantial protection, affecting investors and suppliers' risk-taking. Kim and Santomero (1988) find out that bank risk-taking and capital have an inverse relation. In this case, banks with higher ratios of equity will not be able to improve their risk-taking because of their risk-averse behavior in the wake of higher economic freedom. Honohan (1997) contends that regulators can enforce restrictions to limit credit growth if banks have excessive lending. That is why higher economic freedom can not contribute to greater risk-taking.

Governments must have a safe atmosphere for deposited funds in light of the security of the depositor. For the depositors' protections, deposit insurance is used as a tool to reduce losses (Chernykh & Cole, 2011; Gropp & Vesala, 2004). In contrast, due to deposit insurance, depositors reduce the behavior of monitoring of financial institutions (Demirgüç-Kunt & Huizinga, 2004). (Barth et al., 2004) argue that bank managers can make risky investments due to limited liability and lack of market supervision, which contributes to a rise in banks' risk in terms of insurance costs. Demirgüç-Kunt and Huizinga (2004) explore that high economic freedom leads to a decrease in institutions' interest margin. Sufian and Habibullah (2010) find a strong relationship between the economic freedom and profitability of Chinese banks. Hasan and Dridi (2010) provide

economic freedom to increase innovation and sustainable economic growth. Sufian and Zulkhibri (2011) examine the impact of economic freedom on Islamic banks' performance and conclude a positive relationship. Freixas and Santomero (2004) argue that the government's intervention to control the financial institutions is necessary to avoid the monopoly and higher risk-taking. Dam and Koetter (2012) opine that bank management increases their risk due to the expectation of government intervention. In light of the above arguments, we reach to develop the following hypotheses.

Hypothesis 1: The impact of investment, trade, and financial freedom to influence commercial banks' risk-taking and stability is positive and significant in the US.

Hypothesis 2: The impact of investment, trade, and financial freedom is not similar for well, undercapitalized, high, and low liquid banks in the US.

Hypothesis 3: The impact of investment, trade, and financial freedom is more significant to influence the risk-taking and stability of well-capitalized banks than others in the US.

3. Data and Methodology

Data collection Sample Selection

Annual data for each financial organization were compiled for the duration from 2002 to 2018. The Federal Deposit Insurance Corporation Directory was used by this study to extract the detailed financial information required for analysis, as reported in the FFIEC call / TFR report, which is updated quarterly by the corporation. The sample of this analysis is balanced panel results, including insured commercial banks, as stated by FDIC based on consolidated assets. There were 1806 banks on the list issued by FDIC on 31 December 2018. However, the samples were chosen based on clear criteria: I) a bank has to have an active status 2) a bank may have missing values over an entire span of two years for variables; 3) banks must have overall assets above $300 million as of 31 December 2018. Nine hundred one banks were used for analysis after filtering according to the requirements explained. The banks are categorized as a well-capitalized, under-capitalized, high liquid, and low liquid for a clearer comprehension of the relationship between economic freedom components and the risk of bank portfolio. Banks are categorized into sub-categories based on their capital risk ratios. Reduce the division complications between well and under-capitalized banks. Banks have a capital ratio of more than 8 percent to risk-weighted assets classified as well-capitalized, whereas the lower ratios of banks enlist in undercapitalized banks (Aggarwal & Jacques, 1998). However, the average liquid assets are used as a base to divide the banks into highly liquid and low liquid banks.

Dependent and Independent variables

Dependent Variables: Portfolios Risk

The dependent variable of this study is a bank portfolio risk. Researchers use various proxies as an indicator of a bank’s portfolio risk. This study used total risk for risk-taking, which is a comparatively good indicator of a bank’s portfolio risk, as evidenced in previous literature. The latest regulations focus on banks to control their risk-taking by reducing their risky portfolio for the financial system's stability. Due to the limited empirical

results for financial, investment, and trade freedom on a bank's portfolio risk, this study used Z-score as an indicator for deeper understanding and robustness purposes. This proxy is recently applied by (Harkati et al., 2019) for similar purposes, and earlier studies include (Cubillas & González, 2014; Lee & Hsieh, 2013). The higher value of the Z-score represents more excellent stability and Vis Versa.

Independent Variables

The prime concern is financial, investment, and trade freedom. The respective proxies are indexes developed by heritage foundations. The index scores collected from heritage foundation (https://www.heritage.org/index/freedom) covering the period 2002-2018 and similar applied as independent indicators to test the impact on bank portfolio risk. These proxies were used in recent studies by (Cubillas & González, 2014; Ghosh, 2016; Harkati et al., 2019). The index is a score base where the absolute value is ranging from 0-100. The higher score represents greater freedom in investment, financial, and trade activities, whereas the lower scores show lower liberty in investment, trade, and financial activities (Sufian & Hassan, 2012). The right-hand side also includes the following variables: Total capital ratio (Harkati et al., 2019; Lee & Hsieh, 2013; Sufian, 2013). Profitability (Harkati et al., 2019; Lee & Hsieh, 2013). Liquidity (LIQ) (Abbas, Iqbal, & Aziz, 2019; Allen, Jackowicz, Kowalewski, & Kozłowski, 2017). Size (Abbas, Iqbal, & Aziz, 2020; Lee & Hsieh, 2013). Loan growth (Abbas & Masood, 2020a; Harkati et al., 2019). Funding diversity used by (Stiroh, 2004). Market power (Cubillas & González, 2014; Harkati et al., 2019). Income diversification is like (Stiroh, 2004).

Variables Measurements and Data Source

Variables Names	Measurements	References
Dependent Variables		
Portfolio Risk (PR)	Risk-Weighted Assets to total assets	(Abbas & Masood, 2020b)
Z-Score	ROA + TCAPR/SD (ROA)	(Lee & Hsieh, 2013)
Independent Variables		
Financial Freedom	Economic Freedom Index	(Sufian & Habibullah, 2010)
Investment Freedom	Economic Freedom Index	(Sufian & Habibullah, 2010)
Trade Freedom	Economic Freedom Index	(Sufian & Habibullah, 2010)
Capital Ratio	Total Bank equity to total assets	(Stiroh, 2004)
Profitability	Net Income to Total Assets	(Sufian & Habibullah, 2010)
Liquidity ratio	Total liquid assets to total assets	(Abbas et al., 2020)
Loan growth	Yearly change in loans	(Abbas & Masood, 2020a)
Market Power	Bank Deposits to total industry assets	(Abbas & Masood, 2020a)
Income Diversification	1-(net income-operating income)/ operating income	(Stiroh, 2004)
Funding Diversification	1-((equity/total)2+(subordinate debt/ total)2+(deposits/total)2 +(short term fund/total)2)	(Stiroh, 2004)
Size	Natural Log of total assets	(Lee & Hsieh, 2013)

Econometric Model

This study's essential purpose is to explore the influence of financial, investment, and trade freedom on a bank's portfolio risk. The basic linear regression model static form is as under:

$$Y_{i,t} = \alpha + \beta_1 X_{i,t} + \beta_2 Z_{i,t} + \varepsilon \quad (1)$$

Here Y represents dependent variables, which bank portfolio risk of banks, i denotes cross-section, and t signifies time factor. Where X represents desire explanatory variables. The Z represents the other control variables, and ε shows the error term. The static equation model results cannot consider the problems of autocorrelation, heteroscedasticity, and simultaneity of data, which lead to biased results. Due to the problems of endogeneity (correlation of explanatory variables with error terms) and dependence of lagged information of endogenous variables, this study uses a dynamic panel methodology to estimate the unbiased and consistent estimators (Blundell and Bond (2000); Arellano and Bover (1995). The standard form of a dynamic linear model is as under:

$$Y_{i,t} = \alpha + Y_{i,t-1} + \beta_1 X_{i,t} + \beta_2 Z_{i,t} + \varepsilon \quad (2)$$

Here the Y is a dependent variable, which is a bank's portfolio risk in this study i, represents banks and t shows period, $t-1$ is lagged value of a bank' portfolio risk. βUnknown parameters X is independent variables, which include financial, investment, and trade freedom in this case. Z shows the list of control variables, and ε is an error term.

The dynamic system methodology makes the available flexible variance and covariance system under the desired conditions. There are different simulations to use dynamic panel data models under the condition of one-step and two-step estimators such as difference panel estimators and system panel estimators. In this study, a two-step linear system GMM estimator is used because it is considered more efficient than the estimator of a one-step linear GMM approach (Windmeijer (2005). The Two-step, dynamic panel data approach was used by Lee and Hsieh (2013) to investigate the relationship between bank capital, profitability, and risk. It was also used by Altunbas, Carbo, Gardener, and Molyneux (2007) to investigate the association of bank capital, efficiency, and risk. Similarly, Casu and Girardone (2006) used the two-step dynamic panel data approach to inspect the relationship between capital and profitability. The stander form of the system GMM dynamic equation would be as follows:

$$lnY_{i,t} = \varphi Y_{i,t-1} + \beta X'_{i,t} + (\eta_i + \varepsilon_{i,t}) \quad (3)$$

It assumed the specification of equation 3 is a random walk, and the dependent variable is persistent. Due to this reason, the result of difference GMM would be inefficient and biased, mainly in finite samples. When the period remains limited, and cross-sections contain large numbers. The literature suggests that due to weak instruments, the difference GMM performs poorly (Blundell & Bond, 1998). For these contractions and biases, the two-step system GMM is the best choice to use. The system GMM uses one equation in levels form with first differences as instruments, whereas the second equation in a first differenced form with level as instruments. The two-step system GMM approach implicates a higher number of instruments and reduces the bias of small samples. The two-step system GMM approach controls the problem of autocorrelation and heteroscedasticity by developing a weighting matrix using residuals from the first step.

Standard errors are downward biased in a limited sample for which robust standard errors are reported, as suggested by (Windmeijer, 2005). In econometrics, the only significant results are not enough to defend. The growing mathematical literature quantifies post-estimations for each methodology for the validity of estimations. For the two-step system approach, post-estimations are required to test the over-identification of instruments with the J test suggested by (Hansen, 1982) and second-order autocorrelation of residuals (Sargan, 1985).

4. Results and Discussion

Tables 1 and 2 show the results of the descriptive and correlation matrix. The descriptive statistics include maximum, minimum, standard deviation, and the number of observations. The results shw that investment, financial, and trade freedom's maximum values 85, 87.1, and 90, with an average of 73.82, 84.96, and 78.24, respectively. The information for a risk-taking proxy is an average of 72.3% of total assets, whereas the maximum percentage is 90.1 % of total assets. The average of the Z-score is 26.8, the minimum value 2.57, and the maximum value is 61.85, with a standard deviation of 17.38. The figure of descriptive statistics is similar to the information reported in previous studies, which means no abnormality is in data values. The correlations matrix results indicate that correlations among variables are in a normal range, and no evidence of multicollinearity exists in relationships. The sign of variables is justifiable as per economic and financial theories.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Risk-taking	16065	.723	.11	.494	.901
Z-Score	15761	26.876	17.376	2.566	61.849
Investment freedom	16065	73.824	5.009	70	85
Tade freedom	16065	84.959	2.811	79.4	87.1
Financial freedom	16065	78.235	8.565	70	90
Capital ratio	16048	.102	.018	.078	.136
Liquidity	16031	.048	.027	.021	.095
Bank size	16065	13.554	.95	12.259	15.368
Funding diversity	16048	.555	.011	.539	.581
Market power	16065	.139	.271	-.171	2.909
Loan growth	16065	.666	.113	.455	.824
Profitability	16065	.01	.005	-.001	.02
Income diversity	16048	.463	.098	.262	.593

Source: Authors' calculations using Stata

Table 2. Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Risk-taking	1.00												
Z-Score	-0.12*	1.00											
Investment freedom	0.12*	0.01*	1.00										
Trade freedom	0.06*	0.04*	0.49*	1.00									
Financial freedom	0.01*	-0.05*	-0.12*	-0.87*	1.00								
Capital ratio	0.02*	0.16*	0.04*	0.19*	-0.22*	1.00							
Liquidity	-0.15*	-0.08*	-0.02*	0.17*	-0.23*	0.05*	1.00						
Bank size	0.10*	0.14*	0.11*	0.27*	-0.26*	0.11*	-0.06*	1.00					
Funding diversity	0.04*	0.16*	0.05*	0.12*	-0.12*	0.87*	-0.03*	0.22*	1.00				
Market power	0.02*	0.07*	0.01*	0.01*	-0.01*	0.01*	0.03*	0.10*	0.07*	1.00			
Loan growth	0.76*	-0.12*	0.11*	0.03*	0.02*	-0.08*	-0.18*	-0.03*	-0.07*	-0.08*	1.00		
Profitability	0.05*	0.12*	-0.23*	-0.20*	0.12*	0.08*	-0.09*	-0.01*	0.09*	0.03*	0.01*	1.00	
Income diversity	-0.01*	0.25*	-0.12*	0.04*	-0.12*	0.11*	0.03*	0.31*	0.11*	0.11*	-0.12*	0.58*	1.0

Source: Authors' calculations using Stata sig * p<0.05

In tables 3, consists of a two-step system GMM results for the overall sample and well-capitalized banks. The results of the overall sample show that the coefficient of financial freedom is negative and statistically significant. In other words, an increase in financial freedom leads to a decrease in portfolio risk. Theoretically, the liberty of work provides confidence to make a favorable decision, leading to a decrease in banks' riskiness (Ghosh, 2016; Harkati et al., 2019). The literature explores that due to the expectations of government intervention, banks increase their portfolio risk. Economically, greater financial freedom provides more significant opportunities to earn higher profits at lower portfolio risk. One of the justifications of the negative influence of financial freedom on portfolio risk shows the behavior of bank's risk-aversion.

Consequently, the study examines the influence of investment and trade freedom on a bank's portfolio risk. The relationship between investment, trade freedom, and a

bank's portfolio risk is positive and statistically significant at a 1% level of confidence. The findings show that increases in trade and investment freedom lead to an increase in the portfolio risk of commercial banks in the short-run (Borio & Zhu, 2012; Sufian & Habibullah, 2010). The results of well-capitalized banks document that the relationship between financial freedom and portfolio risk is a negative and statistically significant (Ghosh, 2016; Harkati et al., 2019). The coefficient shows that an increase in financial freedom leads to a decrease in the portfolio risk of well-capitalized banks in the USA. The liberty of working is more favorable for well-capitalized banks to optimize their return at a lower risk. The influence of investment and trade freedom on bank portfolio risk of well-capitalized banks is a positive and significant (Sufian & Habibullah, 2010).

Table 6 contains the findings for a two-step system GMM methods for overall and well-capitalized banks on the impact of investment, financial, and trade freedom on banks' stability. We use the Z-score index as a stability indicator. The findings show that trade and investment freedom is beneficial for the stability of commercial banks in the US whereas statistically, the impact of financial freedom is negative on stability. The columns 4, 5, and 6 report the results for well-capitalized banks that show the impact of investment and financial freedom is positive. In contrast, the impact of trade freedom is negative to influence the stability index of well-capitalized banks. The understanding of economic theory suggests that greater freedom in trade and investment increases the demand for loans, which leads to an increase in the portfolio risk of banks in the short-run. The signs of control variables are much exciting and significant in an economic sense. The relationship between capital ratios and portfolio risk is adverse, which indicates that the increase in capital leads to a decrease in the portfolio risk of banks Vis Versa. Theoretically, an increase in capital leads to more confidence and stability for operations (Jacques & Nigro, 1997). The availability of more significant liquid assets causes to decrease the portfolio risk in the short run. There are several justifications to hold a higher liquid asset leads to decrease risk. For example, banks may hold greater liquidity due to the conservatism approach; in a positive sense, banks may hold higher liquid assets to use in speculations purpose in liquid securities (Abbas, Butt, Masood, & Javaria, 2019). The role of funding diversity, loan growth, and income diversification is similar to increasing commercial banks' portfolio risk. The funding diversity and income diversification increase banks' confidence, which leads to an increase in the risky portfolio (Abbas, et al., 2019). The sign of the coefficient of profitability is theoretically correct but insignificant.

Table 3 reports the outcome for the impact of investment, trade, and financial freedom on bank risk-taking measures as risk-weighted assets to total assets ratio by using a two-step System GMM approach model.

	Overall banks results			Well-capitalized banks results		
VARIABLES	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking
	1	2	3	4	5	6
L. Risk-taking	0.786***	0.162***	0.685***	0.736***	0.663***	0.622***
	(0.042)	(0.032)	(0.021)	(0.071)	(0.061)	(0.070)
Financial freedom	-0.016***			-0.031***		
	(0.000)			(0.000)		
Trade freedom		0.017***			0.038***	
		(0.000)			(0.001)	

Investment freedom			0.057***			0.018***
			(0.001)			(0.000)
Capital ratio	-.914***	-.283***	-.174***	-.579***	-.161*	-.737***
	(0.601)	(0.462)	(0.431)	(0.949)	(0.612)	(0.859)
Liquidity	-0.402***	-0.502***	-0.401***	-0.704***	-0.612***	-0.531***
	(0.022)	(0.021)	(0.041)	(0.216)	(0.153)	(0.125)
Bank size	-0.069***	-0.029	-0.001	-0.015**	-0.060*	-0.050**
	(0.002)	(0.001)	(0.001)	(0.006)	(0.004)	(0.003)
Funding diversity	.113***	.274***	.138***	.743***	.937**	.129***
	(0.600)	(0.658)	(0.848)	(.262)	(0.633)	(.519)
Market power	0.001	0.001	0.002	0.012	0.014	0.016
	(0.004)	(0.004)	(0.005)	(0.017)	(0.012)	(0.011)
Loan growth	0.206***	0.303***	0.317***	0.341***	0.324***	0.352***
	(0.029)	(0.024)	(0.023)	(0.046)	(0.045)	(0.041)
Profitability	0.061	0.052	0.032	0.198	0.097	0.133
	(0.179)	(0.181)	(0.176)	(0.417)	(0.365)	(0.350)
Income diversity	0.052***	0.054***	0.056***	0.039	0.052**	0.063***
	(0.010)	(0.010)	(0.009)	(0.025)	(0.021)	(0.020)
Constant	-.278***	-.181***	-.029***	-.309**	-.137***	-.949***
	(0.663)	(0.666)	(0.353)	(0.563)	(0.538)	(0.455)
Observations	14,401	14,401	14,401	3,953	3,953	3,953
Number of ids	901	901	901	248	248	248
AR(2)	0.493	0.343	0.438	0.909	0.950	0.720
Hansen Statistics	0.660	0.273	0.101	0.230	0.053	0.101

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

Table 4 reports the outcome for the impact of investment, trade, and financial freedom on bank risk-taking (risk-weighted assets to total assets ratio and Z-score) by using a two-step System GMM approach model for undercapitalized banks.

VARIABLES	Risk-taking	Risk-taking	Risk-taking	Z-Score	Z-Score	Z-Score
	1	2	3	4	5	6
L. Risk-taking/z-score	0.517***	0.461***	0.718***	0.831***	0.823***	0.749***
	(0.033)	(0.038)	(0.032)	(0.065)	(0.030)	(0.052)
Financial freedom	-0.054			0.236**		
	(0.000)			(0.102)		
Trade freedom		0.012*			0.079***	
		(0.000)			(0.025)	
Investment freedom			0.020			-0.228***
			(0.000)			(0.022)
Capital ratio	-0.793	-0.819**	-0.537*	-0.184**	-0.188**	-0.278***
	(0.757)	(0.387)	(0.368)	(0.971)	(0.703)	(0.821)
Liquidity	-0.652***	-0.544***	-0.532***	-1.176	-8.809	-1.391
	(0.053)	(0.053)	(0.060)	(1.514)	(1.267)	(1.182)
Bank size	-0.002	-0.001	-0.007	-0.484**	-0.462**	-0.626***
	(0.001)	(0.001)	(0.001)	(0.099)	(0.068)	(0.229)
Funding diversity	0.721**	0.671***	0.393***	0.409***	0.356***	0.488***
	(0.781)	(0.684)	(0.628)	(1.363)	(1.021)	(1.120)
Market power	0.004*	0.008*	0.008**	-0.214	-0.331	-0.512
	(0.003)	(0.003)	(0.003)	(0.875)	(0.165)	(0.653)
Loan growth	0.328***	0.334***	0.348***	-2.910*	-2.828*	-1.892
	(0.021)	(0.023)	(0.029)	(1.68)	(1.54)	(1.64)
Profitability	-0.058	0.084	0.017	0.108***	0.108***	0.115***
	(0.170)	(0.181)	(0.179)	(28.52)	(23.88)	(23.59)
Income diversity	0.053***	0.053***	0.052***	0.638***	0.614***	0.509***

	(0.009)	(0.009)	(0.009)	(1.926)	(1.639)	(1.869)
Constant	-0.756**	-0.917***	-0.668**	-0.222***	-0.123***	-0.215***
	(0.341)	(0.321)	(0.256)	(7.407)	(5.071)	(5.032)
Observations	10,815	10,815	10,815	10,687	10,687	10,687
Number of ids	676	676	676	668	668	668
AR(2)	0.085	0.060	0.086	0.705	0.803	0.835
Hansen statistics	0.647	0.921	0.618	0.399	0.077	0.117

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

Table 4 reports the results of a two-step system GMM method for undercapitalized banks. Under-capitalized banks' results prove that the relationship between financial freedom and portfolio risk is negative but insignificant. The coefficient of investment and trade freedom is positive but insignificant. This shows that greater freedom in investment and financial activities have no more important influence on the portfolio risk of under-capitalized banks in the US, which is in line with our study hypothesis 3. Tables 4, columns 4, 5, and 6 represent the impact of investment freedom, trade freedom, and financial freedom for banks' stability. The findings show that trade and financial freedom play a positive role in the stability of under-capitalized banks. In contrast, investment freedom has a negative and statistically significant impact on the stability of under-capitalized banks. The findings are in line with the justification that well-capitalized banks dominate the undercapitalized banks to opt for investment opportunities in high investment freedom.

Table 5 reports the outcome for the impact of investment, trade, and financial freedom on bank risk-taking measures as risk-weighted assets to total assets ratio by using a two-step System GMM approach model.

	High liquid banks results			Low liquid banks results		
VARIABLES	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking
	1	2	3	4	5	6
L. Risk-taking	0.761***	0.571***	0.546***	0.563***	0.553***	0.565***
	(0.0512)	(0.0449)	(0.0516)	(0.0453)	(0.0359)	(0.0400)
Financial freedom	-0.022***			-0.077		
	(0.000)			(0.000)		
Trade freedom		0.029***			0.045	
		(0.000)			(0.000)	
Investment freedom			0.012***			-0.032
			(0.000)			(0.000)
Capital ratio	-0.126***	-0.413***	-0.472***	-0.563	-0.362	0.517
	(0.676)	(0.601)	(0.943)	(0.825)	(0.623)	(0.751)
Liquidity	-0.335***	-0.312***	-0.238**	-0.558***	-0.522***	-0.556***
	(0.084)	(0.088)	(0.101)	(0.111)	(0.093)	(0.096)
Bank size	-0.007**	-0.002	-0.001	-0.003	-0.001	-0.0007
	(0.003)	(0.002)	(0.002)	(0.002)	(0.009)	(0.007)
Funding diversity	0.749***	0.821***	0.415***	0.312	0.128	-0.010
	(0.108)	(0.906)	(0.386)	(0.173)	(0.415)	(0.113)
Market power	0.004	0.006	0.007	-0.002	-0.007	-0.008
	(0.005)	(0.008)	(0.009)	(0.006)	(0.006)	(0.006)
Loan growth	0.538***	0.839***	0.248***	0.149***	0.344***	0.341***

	(0.037)	(0.035)	(0.036)	(0.033)	(0.078)	(0.021)
Profitability	0.788**	0.653**	0.438***	-0.454	-0.442	-0.544*
	(0.368)	(0.223)	(0.257)	(0.231)	(0.242)	(0.235)
Income diversity	0.032**	0.042***	0.055***	0.048***	0.047***	0.038***
	(0.010)	(0.015)	(0.011)	(0.018)	(0.015)	(0.010)
Constant	-0.041***	-0.019***	-0.669***	-0.624	-0.304	0.041
	(0.567)	(0.578)	(0.780)	(0.415)	(0.617)	(0.524)
Observations	7,185	7,185	7,185	7,216	7,216	7,216
Number of ids	450	450	450	451	451	451
AR(2)	0.242	0.201	0.217	0.813	0.878	0.798
Hansen statistics	0.760	0.286	0.726	0.262	0.203	0.128

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

Table 5 contains the results of a two-step system GMM method for high and low liquid banks. The results of high liquid banks reveal an inverse relationship between financial freedom and portfolio risk Harkati et al. (2019) that aligns with baseline results. In contrast, the relationship is positive between investment, trade freedom, and portfolio risk (Sufian & Habibullah, 2010). The high liquid banks utilize their resources to secure greater profits under lower restrictions. In other words, lower financial restrictions are more favorable for high liquid banks. The findings show that higher investment and trade freedom increase the portfolio risk of high liquid banks upward (Sufian & Zulkhibri, 2011). Low liquid banks' results document that the change in financial, investment, and trade freedom does not influence the portfolio risk of low liquid banks. The theory suggests that banks suffering the shortage of liquid assets remain in a steady-state position.

Table 7 consists of the results of a two-step system GMM method for high and low liquid banks on the impact of investment, trade, and financial freedom on banks' stability. The findings reveal that the impact of investment and trade freedom is positive for high and low liquid banks' stability. In contrast, the impact of financial freedom on the stability of low and high liquid banks is statistically significant and negative in the short run.

Table 6 reports the outcome for the impact of investment, trade, and financial freedom on bank risk-taking measures as risk-weighted assets to total assets ratio by using a two-step System GMM approach model.

	Overall sample results			Well-capitalized banks results		
VARIABLES	Z-Score	Z-Score	Z-Score	Z-Score	Z-Score	Z-Score
	1	2	3	4	5	6
L.Z-Score	0.850***	0.804***	0.808***	0.139***	0.041***	0.836***
	(0.039)	(0.009)	(0.027)	(0.137)	(0.019)	(0.050)
Trade freedom	0.359***			-0.425**		
	(0.083)			(0.191)		
Investment freedom		0.0932***			0.487***	
		(0.029)			(0.164)	
Financial freedom			-0.321***			0.169***
			(0.054)			(0.039)
Liquidity	0.734	-0.513	-0.515	0.362	0.067	-0.313
	(1.435)	(1.044)	(1.045)	(4.531)	(3.183)	(2.112)
Bank size	-0.507***	-0.390**	-0.632***	-0.518**	-0.521***	-0.797***
	(0.318)	(0.243)	(0.325)	(1.217)	(0.628)	(0.398)
Funding diversity	0.830***	0.408***	0.520***	0.643**	0.471**	0.446***

	(1.280)	(8.814)	(1.046)	(3.186)	(1.642)	(1.010)
Market power	0.043	0.618	0.512	-0.988	-0.689	-0.428
	(0.825)	(0.668)	(0.632)	(1.531)	(1.122)	(0.765)
Loan growth	-0.622	-1.542	-1.328	3.776	0.265	-3.311*
	(1.132)	(1.022)	(1.024)	(5.024)	(2.075)	(1.055)
Income diversity	0.783	0.675***	0.558	-0.902	-0.601	1.133
	(1.093)	(1.054)	(1.081)	(8.102)	(4.070)	(2.034)
Constant	-0.323***	-0.258***	-0.231***	-0.241*	-0.234***	-0.163***
	(6.826)	(4.304)	(4.505)	(1.206)	(9.101)	(5.015)
Observations	14,225	14,225	14,225	3,905	3,905	3,905
Number of ids	890	890	890	245	245	245
AR(2)	0.365	0.908	0.809	0.792	0.643	0.761
Hansen statistics	0.262	0.203	0.321	0.162	0.077	0.117

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

Table 7 reports the outcome for the impact of investment, trade, and financial freedom on bank risk-taking measures as risk-weighted assets to total assets ratio by using a two-step System GMM approach model.

	High liquid banks resutls			Low liquid banks results		
VARIABLES	Z-Score	Z-Score	Z-Score	Z-Score	Z-Score	Z-Score
	1	2	3	4	5	6
L.Z-Score	0.910***	0.925***	0.852***	0.871***	0.925***	0.811***
	(0.131)	(0.061)	(0.063)	(0.018)	(0.050)	(0.045)
Trade freedom	0.524**			0.381***		
	(0.271)			(0.113)		
Investment freedom		0.0639**			0.212***	
		(0.030)			(0.035)	
Financial freedom			-0.296**			-0.222***
			(0.073)			(0.027)
Liquidity	0.313	-1.045	-2.601	-4.209	-0.892	-1.719
	(3.819)	(1.672)	(1.643)	(1.326)	(1.423)	(1.221)
Bank size	-1.300**	-0.277	-0.825**	-0.311*	-0.244*	-0.622**
	(0.601)	(0.203)	(0.401)	(0.102)	(0.104)	(0.236)
Funding diversity	0.881***	0.419***	0.514***	0.459***	0.493***	0.542***
	(3.167)	(1.114)	(1.313)	(1.112)	(1.344)	(1.911)
Market power	-0.016	0.537	1.252	0.419	1.113	1.221
	(1.611)	(0.031)	(1.003)	(0.900)	(1.501)	(1.010)
Loan growth	0.796	-0.672	-0.254	-2.331	-1.436	-2.117
	(2.576)	(1.255)	(1.645)	(1.370)	(1.677)	(1.411)
Income diversity	-0.599	3.194	2.307*	2.918**	3.432**	2.723**
	(2.311)	(2.432)	(2.824)	(1.719)	(1.147)	(0.133)
Constant	-0.722***	-0.064***	-0.264***	-0.212***	-0.241***	-0.211***
	(1.700)	(5.876)	(5.361)	(6.166)	(6.766)	(5.715)
Observations	7,089	7,089	7,089	7,136	7,136	7,136
Number of ids	444	444	444	446	446	446
AR(2)	0.743	0.947	0.460	0.221	0.354	0.255
Hansen statistics	0.065	0.623	0.082	0.488	0.077	0.235

Rebust standard errors are in parentheses*** p<0.01, ** p<0.05, * p<0.1

Robustness Check

The study uses several alternatives to support the baseline findings, including the different proxies and econometric techniques. The study uses panel OLS to the confirmation of the sign and significance of coefficients. The results of Table 8 show the robustness of the relationship between economic freedom and banks' risk-taking and the stability of the overall sample and well-capitalized banks. Table 9 contains the findings for high and low liquid banks. The results seem to be a similar sign and significance. However, the coefficients' magnitude is not similar as expected due to the difference in a two-step GMM and panel OLS method. The results show that the influence of financial freedom is a negative (Ghosh, 2016; Harkati et al., 2019), whereas investment and trade freedom positively influence the risk-taking of banks (Sufian & Habibullah, 2010; Sufian & Zulkhibri, 2011). The findings are consistent even in the case of sub-categories of the sample. The impact of financial, investment, and trade freedom is more significant in influencing the risk-taking of well-capitalized and high liquid banks than under-capitalized and low liquid banks. The role of financial freedom is significant for banks' risk-taking perspective. The outcomes document that financial liberty leads to a decrease in the risk-taking of commercial banks. The decrease in risk-taking leads to an increase in the stability of the financial system. The results reveal that commercial banks' risk-taking and economic freedoms have a significant relationship to influence each other (Dam & Koetter, 2012). The results of this study highlight the government's role to influence the bank risk-taking through economic freedoms. To save space, only limited results are reported.

Table 8 reports the outcome for the impact of investment, trade, and financial freedom on bank risk-taking measures as risk-weighted assets to total assets ratio by using a panel OLS fixed effect approach model.

	Overall banks results			Well-capitalized banks results		
VARIABLES	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking
Panel-A:	1	2	3	4	5	6
Financial freedom	-0.012***			-0.033***		
	(0.000)			(0.000)		
Trade freedom		0.027***			0.048***	
		(0.000)			(0.001)	
Investment freedom			0.051***			0.032***
			(0.001)			(0.000)
			Panel-B: Results for Z-score			
Stability	**Z-score**	**Z-score**	**Z-score**	**Z-score**	**Z-score**	**Z-score**
Trade freedom	0.359***			-0.425**		
	(0.083)			(0.191)		
Investment freedom		0.0932***			0.487***	
		(0.029)			(0.164)	
Financial freedom			-0.321***			0.169***
			(0.054)			(0.039)
Capital ratio	-.014***	-.203***	-.104***	-.549***	-.261*	-.337***

	(0.611)	(0.362)	(0.531)	(0.849)	(0.712)	(0.759)
Liquidity	-0.322***	-0.302***	-0.201***	-0.904***	-0.312***	-0.511***
	(0.022)	(0.021)	(0.042)	(0.206)	(0.152)	(0.124)
Bank size	-0.061***	-0.021	-0.001	-0.010**	-0.061*	-0.051**
	(0.002)	(0.001)	(0.001)	(0.006)	(0.004)	(0.003)
Funding diversity	.213***	.374***	.238***	.643***	.737**	.229***
	(0.500)	(0.518)	(0.748)	(.362)	(0.533)	(.419)
Market power	0.001	0.001	0.002	0.012	0.014	0.016
	(0.004)	(0.004)	(0.005)	(0.017)	(0.012)	(0.011)
Loan growth	0.061***	0.031***	0.321***	0.321***	0.321***	0.312***
	(0.020)	(0.020)	(0.020)	(0.044)	(0.043)	(0.042)
Profitability	0.021	0.042	0.012	0.138	0.017	0.123
	(0.079)	(0.101)	(0.156)	(0.427)	(0.345)	(0.310)
Income diversity	0.002***	0.004***	0.051***	0.031	0.054**	0.033***
	(0.010)	(0.010)	(0.009)	(0.025)	(0.021)	(0.020)
Constant	-.378***	-.121***	-.019***	-.329**	-.132***	-.149***
	(0.633)	(0.616)	(0.313)	(0.553)	(0.538)	(0.415)
Observations	14,401	14,401	14,401	3,953	3,953	3,953
Number of ids	901	901	901	248	248	248
R-square	0.43	0.33	0.48	0.29	0.59	0.27

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

Table 9 reports the outcome for the impact of investment, trade, and financial freedom on bank risk-taking measures as risk-weighted assets to total assets ratio by using a panel OLS fixed effect approach model.

	High liquid banks results			Low liquid banks results		
VARIABLES	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking	Risk-taking
Panel-A:	**1**	**2**	**3**	**4**	**5**	**6**
L. Risk-taking	0.761***	0.571***	0.546***	0.563***	0.553***	0.565***
	(0.0512)	(0.0449)	(0.0516)	(0.0453)	(0.0359)	(0.0400)
Financial freedom	-0.022***			-0.077		
	(0.000)			(0.000)		
Trade freedom		0.029***			0.045	
		(0.000)			(0.000)	
Investment freedom			0.012***			-0.032
			(0.000)			(0.000)
Panel-B: Z-score Results						
Stability	**Z-score**	**Z-score**	**Z-score**	**Z-score**	**Z-score**	**Z-score**
Trade freedom	0.524**			0.381***		
	(0.271)			(0.113)		
Investment freedom		0.0639**			0.212***	
		(0.030)			(0.035)	
Financial freedom			-0.296**			-0.222***
			(0.073)			(0.027)
Constant	-0.041***	-0.019***	-0.669***	-0.624	-0.304	0.041
	(0.567)	(0.578)	(0.780)	(0.415)	(0.617)	(0.524)
Observations	7,185	7,185	7,185	7,216	7,216	7,216
Number of ids	450	450	450	451	451	451
R-square	0.24	0.20	0.21	0.18	0.17	0.19

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

5. Conclusion

This study explores the impact of investment, financial, and trade freedom on banks' risk-taking and stability of US commercial banks by using a two-step system GMM approach over the extended period from 2002 to 2018. Banks' risk-taking and stability are significant aspects to measure the growth and performance of the financial system. It is important to examine the impact of investment, trade, and financial freedom on banks' risk-taking and stability because the findings will enable commercial banks to make appropriate decision-making to get favorable results. Therefore, many researchers investigate the impact of economic factors on the risk-taking of banks. However, most, if not all, examine the impact of economic freedom on banks' financial performance, but not for risk-taking and stability, especially for the US commercial banks. The lacking of insights in the context of commercial banks in the US motivates us to bridge the gap in the literature to explore the impact of investment, financial, and trade freedom on the risk-taking and stability of banks. Based on the economic theories, we set three hypotheses to state the impact of investment, trade, and financial freedom on commercial banks' risk-taking and stability. To test the hypotheses, we use the GMM technique because it helps to control the problems of endogeneity, autocorrelation, and cross-sectional heteroscedasticity.

The findings provide evidence that overall financial freedom reduces US banks' risk-taking, whereas the investment and trade freedom increases risk-taking in the short-run; other factors hold unchanged. However, the magnitude of change in banks' risk-taking and stability due to freedom varies for well-capitalized, undercapitalized, low liquid, and high liquid insured commercial banks. The changes in risk-taking of under-capitalized banks seem to be marginally less impacted compared to well-capitalized banks. However, the changes in risk-taking due to investment, trade, and financial freedom low liquid banks appear to be slightly less influenced compared to high liquid commercial banks. The result suggests that the government's intervention is decisive in developing the degree of economic freedom for the stability of the financial system. For well-capitalized insured banks, a high degree of financial freedom reduces risk-taking, whereas trade and investment freedom increase risk-taking. For undercapitalized banks, risk-taking is not impacted by financial and investment freedom, whereas trade freedom increases risk-taking but slightly. A high degree of financial freedom for high liquid banks decreases risk-taking, investment, and trade freedom, increasing risk-taking. The low liquid banks are not influenced by financial, trade, and investment freedom. The findings show that overall the investment and trade freedom is beneficial for the stability of commercial banks in the US. The findings remain robust by using an alternative econometric method.

The outcomes of this research have economic significance for regulators and policymakers. In light of the empirical evidence, the regulators, decision-makers, analysts, and bank managers may formulate appropriate guidelines for the financial system's stability. The results suggest that regulators and policy developers consider the role of investment, financial, and trade freedom to influence risk-taking and stability while developing risk mitigation guidelines. The results of this study also highlight that government interventions on business and economic activities have a significant impact on the risk-taking of commercial banks. Our study remains restricted to the analysis of

quantitative information for large commercial banks. Here, we can still collect data for a longer period and investment, saving, and small commercial banks. Future research could be conducted to study the impact of investment, trade and financial freedom by using the data for saving, investment, and smaller banks to get better in-depth insights.

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