# Watchdogs or Petdogs:

# The Role of Media Freedom on Banking System Stability

**My Nguyen**

School of Economics, Finance and Marketing, RMIT University

**Ama Samarasinghe**[1]

College of Business and Law, RMIT University

**Michael Skully**

Department of Banking and Finance, Monash University

**Abstract**

This paper documents a positive association between media freedom and bank stability at both bank- and systemic- levels. The results are robust to addressing endogeneity concerns. We further find evidence supporting the depositor discipline channel that enhanced media freedom diffuses more information about intermediaries to depositors, incentivising them to discipline and limit bank risk-taking activities. Media freedom also exerts a larger influence on bank stability in developed countries and state ownership of media impedes the positive relation between media freedom and bank stability. Overall, our results highlight the importance of media freedom in enhancing individual bank and systemic stability around the world.

*Keywords*: bank stability, media freedom, market discipline, media ownership

*JEL classifications:* G21, G28, O16

[1] Corresponding author

# Watchdogs or Petdogs:

# The Role of Media Freedom on Banking System Stability


## Abstract

This paper documents a positive association between media freedom and bank stability at both bank- and systemic- levels. The results are robust to addressing endogeneity concerns. We further find evidence supporting the depositor discipline channel that enhanced media freedom diffuses more information about intermediaries to depositors, incentivising them to discipline and limit bank risk-taking activities. Media freedom also exerts a larger influence on bank stability in developed countries and that state ownership of media impedes the positive relation between media freedom and bank stability. Overall, our results highlight the importance of media freedom in enhancing individual bank and systemic stability around the world.



*Keywords*: bank stability, media freedom, market discipline, media ownership

*JEL classifications:* G21, G28, O16

## 1 Introduction

The degree of press freedom is a crucial indicator of the quality of a country's institutional environment. A free press acts as a platform for the free interchange of information and ideas and therefore is vital to effectively disseminate information to a country's citizens. Behaviour of retail depositors is often influenced by changes in the economic information environment, which is mostly shaped by the media. Hasan, Jackowicz, Kowalewski, and Kozłowski (2013) and Wisniewski and Lambe (2013) document evidence of the sensitivity of depositor behaviour due to information disseminated by the media. Thus, higher press freedom leads to an increase in informed depositors and investors whose reactions to such information ultimately affect bank behaviour. However, there remains a paucity of evidence on how press freedom affects overall bank stability and the economic channels through which such impact works. This paper attempts to address these research gaps in the literature.

We argue that media freedom can positively affect bank stability by fostering timely dissemination of information about banks and thereby improving market discipline. Calomiris and Kahn (1991) specify market discipline as the incentives of depositors to monitor bank risk and implement measures to limit excessive bank risk-taking. The trust of depositors in financial institutions particularly is of paramount importance to the stability of the banking sector. Even the banking regulation initiatives, including Basel II and III, highlight the value of preserving efficient market discipline from both bank debt and shareholders. With regard to the former's market discipline, Fungáčová, Hasan, and Weill (2019) show that media exert a significant impact on depositor trust by alleviating information asymmetry concerns and providing depositors with real time information about bank operations (Dang, Dang, Moshirian, Nguyen, & Zhang, 2019; Fang & Peress, 2009; Peress, 2014; Tetlock, 2010; Turner, Ye, & Walker, 2018). Similarly, the monitoring capability of depositors improves especially via the information about the financial position of banks (Bliss & Flannery, 2002; Brunetti & Weder, 2003; Djankov, McLiesh, Nenova, & Shleifer, 2003). Tausch and Zumbuehl (2018) further show that the risk perception of market agents is affected by the degree of news coverage, which should be possible only with increased media freedom. In a more general aspect, several literature suggest the significant impact that media coverage can exert on the decisions and the behaviour investors in the stock market (Antweiler & Frank, 2004; Barber & Odean, 2008; Engelberg & Parsons, 2011). On a further note, enhanced media freedom and the resulting broad news coverage allows depositors to utilise information from the media to analyse aspects of a firm's reputation that are not directly discernible.

Depositors can react to the news about banks through executing different disciplinary measures. For instance, a possible reaction to negative news by depositors about a particular bank could be reallocating funds from a bank perceived as 'risky' to other banks perceived as 'less risky'. Or else, subject to the risk appetite of the depositors, they may need higher interest rates on the invested funds to retain their funds in the bank or can decide to withdraw their funds. Such depositor disciplinary measures can lessen the risk appetite of the banks themselves, thereby improving bank stability. Given these findings, we argue that by prompting such disciplinary measures, media freedom can potentially be an important external factor affecting bank stability.

To the extent that media freedom affects market discipline, it can also influence the stability of the banking sector. Information sensitivity of depositors may especially be substantial during the periods of financial crisis. High degree of freedom allows the media to provide an unrestrained news flow during the times of crisis. This can influence depositors to implement more vigorous disciplinary measures, thereby triggering banks runs which will be detrimental to financial stability.

Building upon these theories, this paper conducts an in-depth examination of the role of media freedom in influencing overall bank stability. In this paper, we combine both market based and accounting based measures of bank stability as well as incorporate a variety of perspectives including, but not limited to the level of independence of the media, capability of citizens to interact with media, the level of control of authorities over the journalistic content on the internet, the ability of the media to investigate and criticise and the level of financial pressure faced by the media, to conduct detailed analyses. Using a comprehensive sample of 21,137 commercial banks in 153 developed and developing countries from 2001-2021, we find that the level of media freedom has a strong and significantly positive effect on bank stability. Our findings are also economically significant. These results are robust to several tests, including using alternative measures of press freedom, bank stability and numerous institutional variables. To address potential endogeneity concerns, in addition to using a fixed effects model to control for unobserved heterogeneity across countries, we further conduct an instrumental variable regression analysis incorporating different instrumental variables. Consistent with our baseline results, we find that the fitted value of media freedom is positively related to bank stability.

In additional analyses, we test whether depositor discipline is the economic channel underlying our main hypothesis. Specifically, enhanced media freedom resulting from prompt and timely media reporting helps depositors respond swiftly by initiating disciplinary measures such as reallocating or withdrawing funds or demanding more return for invested capital. We employ path analysis to examine to what extent the media freedom increases bank stability through triggering depositor discipline. Consistent with our conjecture, we find that depositor discipline is positively correlated with media freedom and that deposit discipline is a robust economic channel through which press freedom increases bank stability. We further explore whether the impact of media freedom on bank stability varies with country-level economic development. Specifically, we examine whether the impact of media freedom on bank stability varies between developed and developing countries. We argue that in developed countries with comparatively better quality educational and institutional environments and enhanced access to media and internet, reaction of public to media news should be comparatively higher in comparison to developing countries. Thus, the positive impact of media freedom on bank stability should be more pronounced in developed countries. We find evidence which corroborates this conjecture.

Our findings contribute to literature in several ways. First, we contribute to the literature which relate the role of media on bank activities. Houston et al. (2011) document a positive relationship between state ownership of the media and bank corruption. Ho et al. (2016) find significant impact of media monitoring on the corruption in lending practices in government owned banks. Both studies mainly relate to the impact of media monitoring on bank corruption. To the best of our knowledge, this paper is the first to demonstrate that media freedom leads to greater bank stability. Furthermore, we explore the channels through which press freedom influences the degree of bank stability. Specifically, we show that increased depositor discipline resulting from media freedom enhances bank stability.

Second, we add to the bank stability literature that examines various determinants of bank stability. At the bank level, bank stability is influenced by bank size, capital ratio, bank liquidity, operational efficiency, diversification and asset structure (Haq & Heaney, 2012; Lepetit, Nys, Rous, & Tarazi, 2008; Moutsianas & Kosmidou, 2016). At the macro and country level, bank stability is determined by GDP growth, economic development and the level of institutional quality (Fung, Lee, Yeh, & Yuen, 2020; Shim, 2019). Adding to this strand of literature, we find that media freedom as a new and important factor affecting bank stability. We also contribute to the limited literature on the determinants of bank systematic risk. While

most of the existing studies in bank stability literature have only focused on accounting based individual risk measures, overlooking the bank's contribution to systemic risk (Leroy & Lucotte, 2017), we analyse the effect of media freedom on both individual and systemic dimensions of bank risk. Exploring the determinants of bank stability is essential because bank stability is of paramount importance to maintain the overall financial stability of a country and thus, knowledge of the determinants of bank stability is crucial for regulatory authorities, whose primary focus is to ensure the stability of the financial system.

Third, this paper contributes to the literature that emphasises the role of the media on the economy. The importance of a free media for the economic wellbeing of a country is widely recognised in existing literature. A free media plays an important role in promoting economic development through facilitating free flow of information, by enhancing government accountability and transparency and further by raising political awareness of citizens (Besley & Prat, 2006; Leeson, 2008). By providing evidence of the positive impact that enhanced media freedom has on bank stability, this paper adds to this strand of literature which reiterates the importance of a free media for economic and financial wellbeing of a country.

Our results present strong policy and practical implications. Given that there is a positive relationship between media freedom and bank stability, regulators and government should implement necessary measures to enhance the freedom of the press which contributes to improved market discipline and informational awareness which consequently result in improving bank stability. As we show in the results section of this paper, since government ownership of media reduces the positive impact of media freedom on bank stability, governments should minimise their influence on the media to harness the positive impact that media freedom creates on the stability of the banking sector.

The rest of the paper is organised as follows: Section 2 outlines the data and methodology. Section 3 presents the empirical model and results, Section 4 presents the results of the instrumental variable analysis and robustness tests, Section 5 presents the results of the cross-sectional analyses and the economic channels and Section 6 concludes.

## 2 Data and Methodology

### *2.1 Data, sampling procedure and sample selection*

To examine the relationship between press freedom and bank stability, we employ the world press freedom index published by Reporters Without Borders (RFS). Accounting data for commercial banks are retrieved from Fitch Connect which is a commercial database on

major international banks provided by Fitch Solutions. Market level data used to compute market-based bank stability measures are from DataStream. Human development index is downloaded from the United Nation Development Programme website while macroeconomic indicators and national governance index data are retrieved from the World Development Indicators from the World Bank and Kaufmann et al. (2019), respectively.

In terms of sampling procedure, we determine our final sample as follows. First, we exclude banks that do not have at least three consecutive bank-year observations and those with negative asset, loan and deposits values. Second, for mergers and acquisitions cases, we treat the target and acquiring banks as two separate entities as long as their data are reported separately. If a non-bank acquirer is involved and unconsolidated data are not available after the merger, the target bank is then excluded from the sample. In addition, to avoid survivorship bias, unbalanced bank-specific panel data are used to cover as many banks as possible including those that did not operate during the entire 20-year period of 2001-2021. Our sample spans over 20 years (2001-2021) and comprises 21,137 listed and non-listed commercial banks across 153 developed and developing countries. We then exclude our non-listed commercial banks from the sample and merge with the DataStream database manually using bank names to obtain necessary data to calculate systemic stability measures. The step results in a sample of 645 listed commercial banks in 77 countries.

### *2.2 Bank stability measures*

We employ income volatility, Z-index, marginal expected shortfall and *SRISK* as measures of both bank- and systemic-measures of stability. While most of the existing studies in bank stability literature have only focused on accounting based individual risk measures, overlooking the bank's contribution to systemic risk (Leroy & Lucotte, 2017), we analyse the effect of media freedom on both individual and systemic dimensions of bank risk. Furthermore, since media freedom, our main variable of interest, is at the country level, we believe the most appropriate bank stability measures to be utilised in this paper are the systematic market risk measures which quantify banks' contribution to systematic risk, rather than solely relying on individual risk taking of banks using accounting-based measures of bank risk.

### *2.2.1 Income volatility*

A traditional measure of bank specific risk is the standard deviation of net interest margin with an example of this type of measure in banking being provided by Williams (2014). This study will employ three-year window to generate estimates of bank risk (*STD_NIM*).

### *2.2.2 Z-index*

Z-index (*ZSCORE*) represents the number of standard deviations below the mean by which profits would have to fall so as to deplete the banks equity capital (Khan *et al.*, 2017). It equals to the return on assets plus the capital-to-asset ratio divided by the standard deviation of asset returns. It is mathematically presented as follows:

$$Z - index = \frac{ROA + (\frac{Equity}{Assets})}{\delta(ROA)} \quad (1)$$

Where *ROA* is return on asset which is the ratio between net income and total assets. We calculate the standard deviation of asset return using the three-year rolling windows. The Z-index is equivalent to the inverse of the probability of insolvency. It is an objective measure which can be used by any bank since all banks are exposed to the same risk of insolvency when capital is exhausted. Hence the higher the Z-index, the more stable the bank is.

### *2.2.2 Marginal expected shortfall*

We define the bank marginal expected shortfall (*MES*) as its short-run expected equity loss conditional on the market taking a loss greater than its Value-at-Risk at α% (Acharya *et al.*, 2017). $R_{i,t}$ is denoted as the daily (log) stock return of the firm and $R_{m,t}$ is the daily index return. Then the *MES* is defined as:

$$MES_{i,t} = E_t(R_{i,t+1} | R_{m,t+1} < q_{\alpha,t}(R_{t+1}) = C) \quad (2)$$

Where, *C* is a constant corresponding to the "tail risk" definition in the market which in our study is Value at Risk at 5% and 1% levels. Expected Shortfall (ES) as the expected loss in the index conditional on this loss being greater than *C*, that is: $ES_t = E_t(R_{m,t+1} | R_{m,t+1} < C)$. When banks belong to the market, it is straightforward to see that the MES of one bank is simply the derivative of the market's ES with respect to the bank's market share (or capitalization), hence the term ''marginal''. Note that in this case, the MES of a bank can be interpreted as reflecting its participation in overall systemic risk. As discussed by Acharya, et al. (2010), MES has several advantages over other measures such as Value at Risk, including its ease of computation. MES also allows for extreme events rather than discarding events that lie beyond a designated cut-off point. Furthermore, MES does not impose a normal distribution

restriction and is able to predict the worst performing banks during the 2007–2009 financial crisis.

### *2.2.3 SRISK*

We use *SRISK* to measure banking system stability which is defined as the expected capital shortfall of a financial entity conditional on a prolonged market decline (Brownlees and Engle, 2017). This measure is better than Acharya et al. (2017) systemic expected shortfall as it possesses higher predictive power than the latter and it does not rely on any structural assumptions. Formally, *SRISK* is defined as:

$$SRISK_{i,t} = kD_{i,t} - (1-k)W_{i,t}(1 + LRMES_{i,t}) \quad (3)$$

Where, $D$ is the book value of debt, $W$ is the market value of equity and $k$ is the prudential capital fraction. The data are available on a daily basis, and we use the year-end value for each country. We then scale this measure of systemic risk by the country's real Gross Domestic Product (GDP).

## *2.3 Media Freedom*

Our primary variable of interest is media freedom (*press freedom*). The data are from the Press freedom index published by Reporters Without Borders (RSF) which assesses the level of media freedom in 180 countries from 2001-2022. The broad coverage of this index allows us to perform the analysis in a wide-ranging set of countries with different levels of press freedom and market structure. The index covers a wide range of aspects related to media freedom including, but not limited to, violations affecting media, the ability of the media to investigate and criticise, the level of financial pressure faced by the media, the legal framework or the regulations related to the media, violations of the free flow of information on the internet and the level of independence of the media. We have taken the logarithm of press freedom values to remove skewness. For the ease of interpretation, we have multiplied the resulting value by -1 to make the variable increasing in value. Thus, higher values of media freedom represent higher levels of media freedom and vice versa.

# 3 Empirical models, results and discussion

## *3.1 Empirical model*

We begin our analysis of the relation between media freedom and bank stability by employing the following regression model:

$$Bank\ Stability_{ict} = \alpha + \beta_1 Media\ Freedom_{ct} + \beta_2 Bank\ Controls_{ict} + \beta_3 Macro\ Controls_{ct} + \nu_c + \mu_t + \varepsilon_{ict} \quad (4)$$

Where the subscripts *i,c,t* denote bank, country and year respectively. $Bank\ Stability$ is substituted by *STD_NIM, Z-score, MES* and *SRISK*. $Media\ Freedom$ represents press freedom data obtained from RFS. Bank controls include bank size, book equity ratio, customer deposits ratio, liquid assets ratio, bank cost efficiency and bank revenue diversification. Baseline macro controls are included to control for differences in economic development and institutions across countries. These include domestic credit provided to the private sector and GDP growth. Further institutional and macro controls are introduced to the baseline model when performing robustness tests, as discussed later in section 4.2.3.

We control for bank size since the literature associates bank size as a significant determinant of bank stability (Berglund & Mäkinen, 2019; Micco, Panizza, & Yañez, 2007; Pasiouras & Kosmidou, 2007), though a consensus has not been reached thus far regarding the direction of the relationship. Similarly, higher bank equity is associated with less bank risk (John, Phil, & John, 2004; Pasiouras & Kosmidou, 2007), thus we control for book equity ratio. We control for customer deposits to total funding ratio since it is a good proxy for the financial structure of a bank which can impact bank stability. Higher funding costs may imply inefficient management which could lead to financial distress (Berger & DeYoung, 1997; Moutsianas & Kosmidou, 2016). Hence, we control for bank cost efficiency. Maintaining high liquidity allows banks to liquidate assets at times of crisis, and thus, facilitate bank stability (Khan, Scheule, & Wu, 2017). Thus, we control for the liquid asset ratio. We further control for bank revenue diversification which represents a bank's business model (Dietrich & Wanzenried, 2011) which also influences bank stability. Detailed definitions of these variables are included in Table A.1. $\nu_c$ and $\mu_t$ capture country and year fixed effects, respectively. Employing fixed effects helps minimise omitted variable bias by controlling for unobserved heterogeneity. $\varepsilon_{ict}$ is the random error. All continuous variables are winsorized at the 1st and 99th percentile to avoid extreme outliers.

Table 1 displays summary statistics of the key variables used in the analysis. The mean values of *SRISK*, *MES*, computed with value at risk at 1% percentile (herein after referred to as *MES_1%VAR*) and value at risk at 5% percentile (herein after referred to as *MES_5%VAR)* are 0.093, 0.062 and 0.154 respectively. The mean value of the natural logarithm of z score is 3.52. This indicates that, on average, profits would need to fall approximately 34 times their standard

deviation to fully deplete bank equity. The mean value of the natural logarithm of the press freedom measure is -2.7, with some variation across countries. Customer deposits, on average, account for 82% of the total funding of the banks in the sample. The average common equity ratio is 12.5% and bank size (logarithm of total assets in million dollars) has an average value of 19.68. The amount of liquid assets of banks in the sample accounts for 30% of total funding. Finally, non-interest income, on average, accounts for 25% of the total operating income of the banks in the sample with the 75$^{th}$ percentile at 32%.

[Insert Table 1 Here]

### *3.2 Media freedom and bank stability*

Table 2 presents the regression results for Equation 4. Column 1 shows results related to *STD_NIM*, Column 2 shows the results related to *ZSCORE*, Column 3 shows the results related to the *SRISK* measure while Columns 4 and 5 present the results related to *MES_1%VAR* and *MES_5%VAR*, respectively. It should be noted here that while higher values of *ZSCORE* represent higher levels of bank stability, higher values of market risk measures (*SRISK*, *MES_1%VAR* and *MES_5%VAR*) represent higher contribution of banks to systematic risk or lower bank stability. Thus, the positive and statistically significant coefficients of the press freedom measure in the second column and the negative and statistically significant coefficients of the press freedom measure in Columns 3 to 5 all provide evidence that enhanced media freedom results in higher bank stability.[2]

Moreover, the effect of media freedom on bank stability is economically significant. Based on the results in column 1, a one standard deviation increase in media freedom (0.798) will lead to an increase of 0.21 (= 0.269*0.798) in z-score. With a sample mean of z-score equal to 3.52, the effect is clearly significant, corresponding to 6% of its mean value. Similarly, a one standard deviation change in the media freedom measure is associated with a change in *MES_1%VAR* of 0.01 (=0.012*0.798) and a change in *MES_5%VAR* of 0.02 (=0.028*0.798). The corresponding impact is economically significant with mean values of *MES_1%VAR* and *MES_5%VAR* being 0.062 and 0.154 respectively. Overall, these results lend strong support for the positive impact that a free media has on bank stability.

Regarding the control variables, we find that most of the results are in line with prior literature. Specifically, *SIZE* is negatively associated with bank stability in all columns of Table

[2] The smaller number of observations in columns 2 to 4 in comparison to column 1 is the lack of data availability on systematic risk for the purpose of conducting analyses using market-based bank stability measures.

3, which implies that larger banks are less stable. This may be because larger banks may take higher risks in the expectation of a government bail-out in the times of distress (Köhler, 2015). *COST_EFFICIENCY*is negatively associated with both accounting and market stability measures. This provides evidence to the fact that higher cost to income ratio which implies less bank efficiency leads to less stable banks (Moutsianas & Kosmidou, 2016). The coefficient of *REV_DIV* is statistically significant in most columns, and the results imply that higher revenue diversification results in lower bank stability. Expanding to non-traditional sources of income can increase revenue volatility (DeYoung & Roland, 2001), reduce bank's monitoring incentives (Acharya, Hasan, & Saunders, 2006) and more diversified banks tend to maintain lower equity buffers (Abuzayed, Al-Fayoumi, & Molyneux, 2018), thereby leading to less stable banks. The coefficient of domestic credit provided to the private sector is statistically significant only with the z-score.

[Insert Table 2 Here]

## 4 Robustness tests and further analysis

### *4.1 Instrumental variable analysis*

In our study, reverse causality is less of a concern because it seems unlikely that individual bank level stability will influence national wide media freedom. However, unobservable bank characteristics and macroeconomic conditions can drive both the degree of press freedom and bank stability. Thus, to address this potential endogeneity concern, we conduct several tests. First, we include several industry-level, macro-economic and bank-specific control variables in main regressions and robustness tests to mitigate the potential omitted variable bias. Moreover, we control for country and year fixed effects in the panel regressions to account for unobserved heterogeneity across countries. We further employ an instrumental variables regression approach. The choice of instruments in our instrumental variable analysis is motivated from studies in media, institution and banking literature (Beck, Demirgüç-Kunt, & Levine, 2003; Egorov, Guriev, & Sonin, 2009; Houston et al., 2011). Following Houston et al. (2011), we use the percentage of years that a particular country has been independent since 1776 as the instrumental variable (IVs) in our analyses. Countries which gained their independence earlier can be assumed to have had more opportunity to improve the quality of the institutional environment including strengthening media freedom, thus, we use the percentage of years that the country has been independent since 1776 as an

IV. This should be a credible instrument since it is less likely that it puts forth a direct, first-order impact on bank stability.

We present the results of the instrumental variable regression analysis in Table 3. The results from the first stage shows that the instrumental variable employed in the analysis has a positive and statistically significant relation with *PRESS_FREEDOM*. The partial *F*-statistics is 19.979, indicating the absence of weak instruments. As evident from the results in Table 3, the empirical results remain robust where the coefficients of instrumented *PRESS_FREEDOM* in the second-stage regressions are statistically significant in all specifications. This reiterates the positive and statistically significant impact that media freedom has on bank stability.

[Insert Table 3 Here]

### *4.2 Other robustness tests*

#### *4.2.1 Alternative measures of press freedom*

To test the robustness of our main findings, we utilise several alternative measures of media freedom and repeat our main estimations from Table 2, using each of the following as our media freedom variable; *Legal*, *Political* and *Total*. These scores are from the annual freedom of the Press (FOTP) survey, published by the Freedom House. These variables mainly reflect the legal and political pressures and economic factors that affect media content. Table 4 presents the results. These results are consistent with the main results presented in Table 4. Specifically, we find that the coefficients of the alternative measures of press freedom are statistically significant in all specifications and the sign of the coefficients with both accounting and market measures of bank stability are mostly consistent with our main results. As such, the significant positive relationship between media freedom and bank stability remains robust even when the alternative measures of media freedom are utilised in the analysis.

[Insert Table 4 Here]

#### *4.2.2 Excluding USA*

We conduct additional tests to ensure the robustness of the results. Specifically, we exclude USA to ensure that the results are not unduly affected by the US observations. The corresponding results are shown in Table 5. As evidenced in columns 1 to 4 of Table 5, the media freedom measure remains statistically significant with both accounting and market bank stability measures even after excluding observations from the US. The control variables mostly yield similar results to Table 2.

[Insert Table 5 Here]

### *4.2.3 Institutional controls*

In the next robustness test, we modify the baseline regression model to include additional country-level factors to mitigate potential omitted variable bias. A common approach followed in literature to reduce the concerns of omitted variable bias is to saturate the regression with many relevant controls (Bitler, Moskowitz, & Vissing-Jorgensen, 2005; Laeven & Levine, 2009). Following prior literature (Ho et al., 2016; Houston et al., 2011; Laeven & Levine, 2009), we include a range of controls which reflect the quality of the regulatory and institutional environment of the countries in our sample. Specifically, we control for numerous institutional and regulatory factors including the voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and the control of corruption in a particular country. These data are collected from the World Bank's World Governance Index website https://info.worldbank.org/governance/wgi/. The results are presented in Table 6. We find that conditioning on all these characteristics, *PRESS_FREEDOM* is positively associated with bank stability. *PRESS_FREEDOM* continues to enter MES regressions negatively and significantly, with a similar coefficient size, suggesting that, even after controlling for the effect of a range of national governance index, the positive relation between media freedom and bank stability persists.

[Insert Table 6 Here]

### *4.2.4 Controlling for the Human development index*

Consistent with the view that high levels of education lead to higher demand for a free press, the reaction and disciplinary actions taken by investors and depositors following news about banks should be higher in countries with better quality educational environments. We proxy this using Human Development Index developed by United Nations Development Programme (UNDP) and examine this potential phenomenon by including the interactive terms between press freedom variable and the Human development index. The related empirical results are presented in Table 7.

As can be seen from the table, the coefficients of the interaction term between media freedom variable and human development index are statistically significant in most of the columns, suggesting a strengthening of the positive impact of media freedom on bank stability in countries with better quality educational environments. The control variables mostly yield similar results to Table 2.

[Insert Table 7 Here]

## 5 Cross-sectional analysis and possible economic channel

### *5.1 Media state ownership*

In the next analysis, we incorporate state ownership of media measure to our main regression model. This is motivated from the findings of Houston et al. (2011) who provide evidence of the significant relationship between state ownership and corruption in bank lending and Ho et al. (2016) who show evidence of the effect that media monitoring can have on the corruption in the lending practices of government owned banks. Specifically, we examine the moderating role of state ownership of media on the association between media freedom and bank stability by interacting media freedom with state ownership. To investigate this conjecture, we employ media ownership and concentration data come from Djankov, McLiesh, Nenova, and Shleifer (2003), who compiled data from various data sources on the ownership patterns and market concentration of media firms around the world. Media state ownership (*STATE_SHARE*) is a dummy equal to one if the top radio station is state owned, and zero otherwise. The results, presented in Table 8, show that the coefficient of the interaction term is positive and significant in *MES* and *SRISK* measures (thus implying less bank stability), suggesting that state ownership of media can impede the positive relation between media freedom and bank stability. Higher state ownership can lead to dissemination of distorted information due to high political pressure and thus result in high potential corruption (Houston et al., 2011), thereby hindering the positive effect of media freedom on bank stability.

[Insert Table 8 Here]

### *5.2 Developed versus developing countries*

Next, we show the differential impacts of the relationship between media freedom and bank stability across developed and developing countries. Developed countries comparatively have better quality institutional and educational environment and their investors have better access to infrastructure including increased access to the media and the internet. Thus, we contend that investor reaction to media news to be greater in such countries in comparison to developed countries. To test this conjecture, we perform additional regression analysis, by including an interaction term between press freedom variable and *DEVELOPED* which is a dummy variable equalling to 1 for developed countries and zero otherwise. Table 9 presents the results.

As is evident from the results of Table 9, the positive effect of enhanced media freedom on bank stability is more pronounced in developed countries. The coefficients of the interaction

term between press freedom and the dummy variable which represents the level of development of a country are statistically significant in most columns and the results hold for both accounting and market bank stability measures. These differential effects further provide evidence of the positive impact that media freedom has on bank stability.

[Insert Table 9 Here]

*5.3 Possible Economic Channel - Media freedom, depositor discipline and bank stability*

In this section, we explore the depositor discipline channel through which media freedom positively affects bank stability. Calomiris and Kahn (1991) define market discipline as the incentives of depositors to monitor bank risk and take actions to curb bank excessive risk-taking activities. Disli, Schoors, and Meir (2013) articulate that depositor can discipline banks through two channels: price mechanism (by demanding higher deposit interest rates) or quantitative mechanism (by withdrawing invested funds), which are expected to reduce risk appetites of banks thereby contributing positively to bank stability. Extreme form of depositor discipline, however, can lead to bank runs and if widespread, can carry costly consequences for the economy. As a result, few countries have been willing to rely fully on depositor discipline as an instrument to curb bank risk-taking behaviour, at least not without offering some form of deposit protection (i.e., explicit deposit insurance). In the United States, for example, the Federal Deposit Insurance Corporation provide guarantees for all deposits up to $100,000 per depositor.

Barth, Nolle, Phumiwasana, and Yago (2003) exert that the effectiveness of depositor discipline lies in the need of enhanced transparency in the economy and information intermediaries, such as financial analysts and public media, play a key role in this regard. Journalists can act as watchdog, keeping an eye on bank operation, revealing, processing, and broadcasting information that is relevant to their public (Dyck et al., 2008). Increased in media freedom, therefore, allows those intermediaries to diffuse more information to depositors, incentivise them to discipline and limit bank risk-taking activities. To what extent does media freedom increase bank stability through triggering depositor discipline? To investigate this research question, we conduct path analysis and design the following models:

$$Bank\ Stability = \beta_0 + \beta_1 \times Media\ Freedom + \beta_2 \times Depositor\ Discipline + Controls + \varepsilon \quad (5)$$

$$Depositor\ Discipline = \alpha_0 + \alpha_1 \times Media\ Freedom + \varepsilon \quad (6)$$

The independent variable of interest is *Media Freedom* which is discussed earlier in Section 2.1. *Controls* are relevant control variables from the baseline regression in Table 2.

The path coefficient $\beta_1$ is the magnitude of the direct path from *Media Freedom* to *Bank Stability* (which is proxied by *Z_SCORE*, *SRISK*, *MES1* or *MES5*). The path coefficient $\beta_2$ are the magnitude of the path from *Depositor Discipline* to *Bank Stability*, respectively. The path coefficient $\hat{\alpha}_1 \times \widehat{\beta_2}$are the magnitude of the indirect path from media freedom to bank stability mediated through depositor discipline, respectively. We depict this relationship in Figure 1 below:

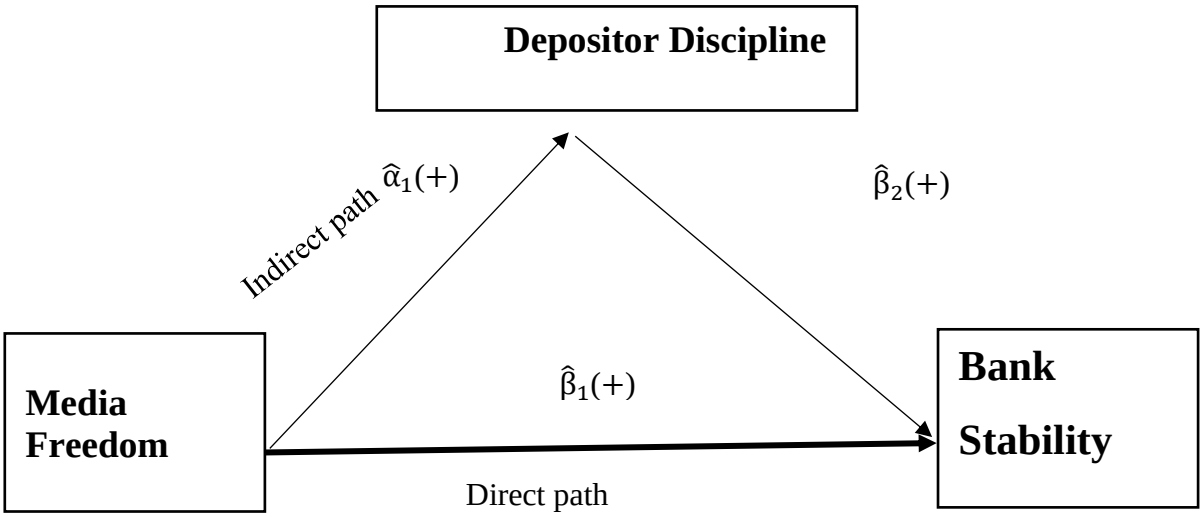


***Figure 1:*** *This figure depicts the direct and indirect path through which media freedom can affect bank stability through deposit discipline.*

Table 10 represents the regression results of equations (5) and (6). Columns (1) to (8) tabulate the regression results of dependent variables *ZSCORE*, *SRISK*, *MES1* or *MES5* respectively. Consistent with the baseline results, we find that press freedom is positively associated with bank stability. The results further show that depositor discipline is positively correlated with media freedom and that deposit discipline is an economic channel through which press freedom increases. More specifically, we find that the effect of media freedom affecting bank stability through depositor discipline path accounting for 8.1%, 11.02%, 4.3% and 3% respectively. All these results support that media freedom affects bank stability through the path of deposit discipline.

[Insert Table 10 Here]

## 6 Conclusion

The present study uses a sample of 153 countries to examine, for the first time in the literature, whether and how media freedom affects bank stability. Since recent literature emphasises both the bright and dark sides of enhanced media freedom, it is important to examine the impact of enhanced media freedom on bank risk taking.

We find robust evidence that enhanced media freedom lowers both individual and systematic bank risk. Our results further suggest that enhanced media freedom improves bank stability by triggering depositor discipline. This is consistent with the view that a free media disseminates timely news and thus, information sensitive depositors react to the news about banks by employing disciplinary measures such as reallocating or withdrawing funds and demanding more return on their deposits. The depositor trust placed on banks is of paramount importance to the stability of the banking sector and thus, such disciplinary actions lead to banks being more cautious on their operations and financial position, thereby reducing excessive bank risk taking.

These findings are robust to controlling for various country-level and bank-level characteristics, employing alternative measures of media freedom and to the use of an instrumental variable approach that mitigates endogeneity concerns. The cross-country setting of our study allows us to show the differential impacts of the relationship between media freedom and bank stability based on the level of development of the countries in the sample. We further find evidence that higher state ownership impedes the positive impact of media freedom on bank stability. This is consistent with the view that higher state ownership leads to dissemination of distorted information due to high political pressure and thus results in high potential corruption (Houston et al., 2011), thereby hindering the positive effect of media freedom on bank stability. Taken together, these findings support the positive impact that enhanced freedom in the media sector exerts on bank stability and thus contribute to a crucial and timely discussion on the pros and cons of media freedom on the economic, societal and financial well-being of countries.

## References


Abedifar, P., Giudici, P., & Hashem, S. Q. (2017). Heterogeneous market structure and systemic risk: Evidence from dual banking systems. *Journal of Financial Stability, 33*, 96-119.

Abuzayed, B., Al-Fayoumi, N., & Molyneux, P. (2018). Diversification and bank stability in the GCC. *Journal of International Financial Markets, Institutions & Money, 57*, 17-43.

Acharya, V., Engle, R., & Richardson, M. (2012). Capital Shortfall: A New Approach to Ranking and Regulating Systemic Risks. *The American Economic Review, 102*(3), 59-64.

Acharya, Viral V., Hasan, I., & Saunders, A. (2006). Should Banks Be Diversified? Evidence from Individual Bank Loan Portfolios. *The Journal of Business, 79*(3), 1355-1412.

Anginer, D., Demirguc-Kunt, A., Huizinga, H., & Ma, K. (2018). Corporate governance of banks and financial stability. *Journal of Financial Economics, 130*(2), 327-346.

Antweiler, W., & Frank, M. Z. (2004). Is All That Talk Just Noise? The Information Content of Internet Stock Message Boards. *The Journal of Finance, 59*(3), 1259-1294.

Barber, B. M., & Odean, T. (2008). All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors. *The Review of Financial Studies, 21*(2), 785-818.

Barth, J. R., Nolle, D. E., Phumiwasana, T., & Yago, G. (2003). A Cross-Country Analysis of the Bank Supervisory Framework and Bank Performance. *Financial Markets, Institutions & Instruments, 12*(2), 67-120.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). Law, endowments, and finance. *Journal of Financial Economics, 70*(2), 137-181.

Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance, 21*(6), 849-870.

Berglund, T., & Mäkinen, M. (2019). Do banks learn from financial crisis? The experience of Nordic banks. *Research in International Business and Finance, 47*, 428-440.

Besley, T., & Prat, A. (2006). Handcuffs for the Grabbing Hand? Media Capture and Government Accountability. *The American Economic Review, 96*(3), 720-736.

Bitler, M. P., Moskowitz, T. J., & Vissing-Jorgensen, A. (2005). Testing Agency Theory with Entrepreneur Effort and Wealth. *The Journal of Finance, 60*(2), 539-576.

Bliss, R. R., & Flannery, M. J. (2002). Market Discipline in the Governance of U.S. Bank Holding Companies: Monitoring vs. Influencing. *Review of Finance, 6*(3), 361-396.

Brunetti, A., & Weder, B. (2003). A free press is bad news for corruption. *Journal of Public Economics, 87*(7), 1801-1824.

Calomiris, C. W., & Kahn, C. M. (1991). The Role of Demandable Debt in Structuring Optimal Banking Arrangements. *The American Economic Review, 81*(3), 497-513.

Dang, T. L., Dang, V. A., Moshirian, F., Nguyen, L., & Zhang, B. (2019). News media coverage and corporate leverage adjustments. *Journal of Banking & Finance, 109*, 105666.

Demirgüç-Kunt, A., & Huizinga, H. (2010). Bank activity and funding strategies: The impact on risk and returns. *Journal of Financial Economics, 98*(3), 626-650.

DeYoung, R., & Roland, K. P. (2001). Product Mix and Earnings Volatility at Commercial Banks: Evidence from a Degree of Total Leverage Model. *Journal of Financial Intermediation, 10*(1), 54-84.

Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions & Money, 21*(3), 307-327.

Disli, M., Schoors, K., & Meir, J. (2013). Political connections and depositor discipline. *Journal of Financial Stability, 9*(4), 804-819.
Djankov, S., McLiesh, C., Nenova, T., & Shleifer, A. (2003). Who Owns the Media? *The Journal of Law & Economics, 46*(2), 341-382.
Dyck, A., Volchkova, N., & Zingales, L. (2008). The Corporate Governance Role of the Media: Evidence from Russia. *The Journal of Finance, 63*(3), 1093-1135.
Egorov, G., Guriev, S., & Sonin, K. (2009). Why Resource-poor Dictators Allow Freer Media: A Theory and Evidence from Panel Data. *The American Political Science Review, 103*(4), 645-668.
Engelberg, J. E., & Parsons, C. A. (2011). The Causal Impact of Media in Financial Markets. *The Journal of Finance, 66*(1), 67-97.
Fang, L., & Peress, J. (2009). Media Coverage and the Cross-section of Stock Returns. *The Journal of Finance, 64*(5), 2023-2052.
Fung, D. W. H., Lee, W. Y., Yeh, J. J. H., & Yuen, F. L. (2020). Friend or foe: The divergent effects of FinTech on financial stability. *Emerging Markets Review, 45*, 100727.
Fungáčová, Z., Hasan, I., & Weill, L. (2019). Trust in banks. *Journal of Economic Behavior & Organization, 157*, 452-476.
Haq, M., & Heaney, R. (2012). Factors determining European bank risk. *Journal of International Financial Markets, Institutions & Money, 22*(4), 696-718.
Hasan, I., Jackowicz, K., Kowalewski, O., & Kozłowski, Ł. (2013). Market discipline during crisis: Evidence from bank depositors in transition countries. *Journal of Banking & Finance, 37*(12), 5436-5451.
Houston, J. F., Lin, C., & Ma, Y. (2011). Media ownership, concentration and corruption in bank lending. *Journal of Financial Economics, 100*(2), 326-350.
Jagtiani, J., & Lemieux, C. (2001). Market discipline prior to bank failure. *Journal of Economics And Business, 53*(2), 313-324.
John, G., Phil, M., & John, O. S. W. (2004). Dynamics of Growth and Profitability in Banking. *Journal of Money, Credit and Banking, 36*(6), 1069-1090.
Kaufman, D., & Kraay, A. (2019). World Governance Indicators (WGI). *Brookings Institution, World Bank Development Economics Research Group*.
Khan, M. S., Scheule, H., & Wu, E. (2017). Funding liquidity and bank risk taking. *Journal of Banking & Finance, 82*, 203-216.
Köhler, M. (2015). Which banks are more risky? The impact of business models on bank stability. *Journal of Financial Stability, 16*, 195-212.
Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics, 93*(2), 259-275.
Leeson, P. T. (2008). Media Freedom, Political Knowledge, and Participation. *The Journal of Economic Perspectives, 22*(2), 155-170.
Lepetit, L., Nys, E., Rous, P., & Tarazi, A. (2008). Bank income structure and risk: An empirical analysis of European banks. *Journal of Banking & Finance, 32*, 1452-1467.
Leroy, A., & Lucotte, Y. (2017). Is there a competition-stability trade-off in European banking? *Journal of International Financial Markets, Institutions & Money, 46*, 199-215.
Micco, A., Panizza, U., & Yañez, M. (2007). Bank ownership and performance. Does politics matter? *Journal of Banking & Finance, 31*(1), 219-241.
Moutsianas, K. A., & Kosmidou, K. (2016). Bank earnings volatility in the UK: Does size matter? A comparison between commercial and investment banks. *Research in International Business and Finance, 38*, 137-150.
Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance, 21*(2), 222-237.

Peress, J. (2014). The Media and the Diffusion of Information in Financial Markets: Evidence from Newspaper Strikes. *The Journal of Finance, 69*(5), 2007-2043.

Tausch, F., & Zumbuehl, M. (2018). Stability of risk attitudes and media coverage of economic news. *Journal of Economic Behavior & Organization, 150*, 295-310.

Tetlock, P. C. (2010). Does Public Financial News Resolve Asymmetric Information? *The Review of Financial Studies, 23*(9), 3520-3557.

Turner, J. D., Ye, Q., & Walker, C. B. (2018). Media Coverage and Stock Returns on the London Stock Exchange, 1825–70. *Review of Finance, 22*(4), 1605-1629.

Williams, B. (2014). Bank risk and national governance in Asia. *Journal of Banking & Finance, 49*, 10-26.

Wisniewski, T. P., & Lambe, B. (2013). The role of media in the credit crunch: The case of the banking sector. *Journal of Economic Behavior & Organization, 85*, 163-175. doi:10.1016/j.jebo.2011.10.012

## Tables

**Table 1 Summary Statistics**

| | Observations | Mean | Std. | p25 | p50 | p75 |
|---|---|---|---|---|---|---|
| *STD_NIM* | 180,279 | 0.175 | 0.434 | 0.033 | 0.066 | 0.133 |
| *ZSCORE* | 179,846 | 3.522 | 1.202 | 2.804 | 3.566 | 4.276 |
| *MES_1* | 5,875 | 0.062 | 0.699 | 0.013 | 0.035 | 0.059 |
| *MES_5* | 5,875 | 0.154 | 0.769 | 0.050 | 0.114 | 0.178 |
| *SRISK* | 3,599 | 0.093 | 0.705 | 0.000 | 0.006 | 0.022 |
| *PRESS_FREEDOM* | 180,279 | -2.698 | 0.798 | -3.235 | -2.720 | -2.197 |
| *SIZE* | 180,279 | 19.675 | 1.887 | 18.366 | 19.392 | 20.715 |
| *BOOKEQUITY* | 180,279 | 0.125 | 0.105 | 0.079 | 0.101 | 0.131 |
| *DEPOSIT_RATIO* | 180,279 | 0.823 | 0.250 | 0.776 | 0.926 | 0.992 |
| *LIQUIDITY_RATIO* | 180,279 | 29.568 | 64.098 | 7.120 | 14.520 | 29.830 |
| *COST_EFFICIENCY* | 180,279 | 0.704 | 0.264 | 0.572 | 0.677 | 0.791 |
| *REV_DIV* | 180,279 | 0.252 | 0.223 | 0.112 | 0.196 | 0.322 |
| *ECON_DEV* | 180,279 | 133.447 | 60.777 | 81.800 | 162.728 | 184.858 |
| *GDP_GROWTH* | 180,279 | 1.964 | 2.997 | 0.998 | 2.168 | 3.076 |

*Notes:* This table reports summary statistics of main variables used in the analysis. See Table A.1 for definitions of all variables.

**Table 2 Baseline Regression**

| | (1) *STD_NIM* | (2) *ZSCORE* | (3) *SRISK* | (4) *MES_1%VAR* | (5) *MES_5%VAR* |
|---|---|---|---|---|---|
| *PRESS_FREEDOM* | -0.011** | 0.269*** | -0.127* | -0.012*** | -0.028*** |
| | [-2.52] | [45.65] | [-1.85] | [-8.84] | [-8.55] |
| *SIZE* | 0.007*** | -0.039*** | 1.013*** | 0.008*** | 0.025*** |
| | [9.77] | [-22.46] | [37.50] | [18.27] | [23.32] |
| *BOOKEQUITY* | 0.265*** | | -1.927 | 0.023** | 0.092*** |
| | [13.76] | | [-1.05] | [2.39] | [3.85] |
| *DEPOSIT_RATIO* | -0.135*** | 0.143*** | -1.157*** | -0.003 | -0.009 |
| | [-17.44] | [8.83] | [-3.74] | [-0.74] | [-0.98] |
| *LIQUIDITY_RATIO* | 0.000*** | 0.000*** | 0.011*** | 0.0002 | 0.0002 |
| | [4.50] | [3.82] | [4.15] | [1.29] | [0.03] |
| *COST_EFFICIENCY* | 0.273*** | -0.721*** | 0.945*** | 0.007** | 0.028*** |
| | [32.23] | [-47.31] | [5.95] | [2.21] | [3.90] |
| *REV_DIV* | -0.042*** | -0.595*** | -0.336 | 0.008** | 0.028*** |
| | [-4.90] | [-33.78] | [-1.63] | [2.24] | [3.06] |
| *ECON_DEV* | 0.0001 | 0.001*** | 0.003 | 0.0001 | 0.0001 |
| | [-0.72] | [23.14] | [1.57] | [-0.25] | [0.82] |
| *GDP_GROWTH* | 0.0001 | -0.017*** | -0.026** | -0.001*** | -0.003*** |
| | [1.22] | [-10.59] | [-1.98] | [-4.72] | [-4.65] |
| Observations | 180,279 | 179,846 | 3,599 | 5,875 | 5,875 |
| Country FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.0685 | 0.0801 | 0.717 | 0.326 | 0.402 |

*Notes:* In this table, we regress five measures of bank risk: interest income volatility (*STD_NIM*), Z-index (*ZSCORE*), systemic risk (SRISK), marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR) on press freedom (PRESS_FREEDOM) in columns (1)-(5), respectively. We include bank size (*SIZE*), equity to total assets ratio (*BOOKEQUITY*), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (*COST_EFFICIENCY*), revenue diversification (*REV_DIV*), private credit to GDP ratio (*ECON_DEV*) and GDP growth ratio (GDP_RATIO). In column (2), we exclude *BOOKEQUITY*. All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

**Table 3 Instrumental Variable Regression**

Panel B: 2nd stage regression

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | *STD_NIM* | *ZSCORE* | *SRISK* | *MES_1%VAR* | *MES_5%VAR* |
| *PRESS_FREEDOM (Instrumented)* | -0.553** | 0.702*** | -13.632** | -0.617*** | -1.390*** |
| | [-2.07] | [36.27] | [-2.04] | [-5.43] | [-5.30] |
| *SIZE* | 0.005*** | -0.006*** | 1.024*** | 0.008*** | 0.024*** |
| | [6.36] | [-3.33] | [35.60] | [16.56] | [21.11] |
| *BOOKEQUITY* | 0.275*** | | -2.365 | 0.021** | 0.086*** |
| | [12.11] | | [-1.16] | [2.29] | [3.62] |
| *DEPOSIT_RATIO* | -0.171*** | 0.459*** | -1.181*** | -0.003 | -0.012 |
| | [-18.71] | [23.33] | [-3.42] | [-0.81] | [-1.24] |
| *LIQUIDITY_RATIO* | 0.000*** | 0.000* | 0.010*** | 0.000 | -0.000 |
| | [4.41] | [1.84] | [4.19] | [0.95] | [-0.19] |
| *COST_EFFICIENCY* | 0.279*** | -0.746*** | 1.194*** | 0.005 | 0.022*** |
| | [32.10] | [-45.89] | [6.34] | [1.44] | [2.68] |
| *REV_DIV* | -0.013 | -0.766*** | -0.302 | 0.016*** | 0.043*** |
| | [-1.41] | [-39.90] | [-1.38] | [4.33] | [4.40] |
| *ECON_DEV* | 0.004** | -0.004*** | 0.097** | 0.004*** | 0.010*** |
| | [2.23] | [-24.11] | [2.08] | [5.44] | [5.33] |
| *GDP_GROWTH* | -0.002 | -0.042*** | -0.057** | -0.003*** | -0.007*** |
| | [-1.27] | [-15.49] | [-2.16] | [-6.26] | [-5.99] |
| | [1.57] | [-7.98] | [-1.38] | [3.62] | [2.73] |
| Observations | 172,720 | 172,248 | 3,408 | 5,501 | 5,501 |
| Country FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.0697 | 0.0695 | 0.703 | 0.302 | 0.375 |
| Instrument coefficient (standard errors) from 1st stage | 0.358*** [7.73] | | | | |
| Partial F-statistics for IV | 19.979 | | | | |

*Notes:* This table reports the coefficients of the two-stage least square (2SLS) regression. In panel B, we regress five measures of bank risk: interest income volatility (*STD_NIM*), Z-index (*ZSCORE*), systemic risk (SRISK), marginal expected shortfall using 1%VAR (*MES_1%VAR*) and marginal expected shortfall using 5%VAR (*MES_5%VAR*) on press freedom (PRESS_FREEDOM) instrumented by the percentage of years that a particular country has been independent since 1776 in columns (1)-(5), respectively. We include bank size (*SIZE*), equity to total assets ratio (*BOOKEQUITY*), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (*COST_EFFICIENCY*), revenue diversification (*REV_DIV*), private credit to GDP ratio (*ECON_DEV*) and GDP growth ratio (GDP_RATIO). In column (2), we exclude *BOOKEQUITY*. We also report the instrument coefficient and standard errors from 1st stage and the partial F-statistics for IV. All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

**Table 4 Alternative measures of press freedom**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *STD_NIM* | *ZSCORE* | *SRISK* | *MES_1%VAR* | *MES_5%VAR* | *STD_NIM* | *ZSCORE* | *SRISK* | *MES_1%VAR* | *MES_5%VAR* | *STD_NIM* | *ZSCORE* | *SRISK* | *MES_1%VAR* | *MES_5%VAR* |
| LEGAL_SCORE | 0.017*** | 0.294*** | 0.035 | -0.017*** | -0.047*** | | | | | | | | | | |
| | [2.58] | [31.14] | [0.32] | [-5.93] | [-6.88] | | | | | | | | | | |
| POLITICAL_SCORE | | | | | | -0.041*** | 0.470*** | -0.545*** | -0.009* | -0.021** | | | | | |
| | | | | | | [-3.88] | [50.41] | [-2.89] | [-1.95] | [-1.97] | | | | | |
| TOTAL_SCORE | | | | | | | | | | | -0.046*** | 0.529*** | -0.495* | -0.017*** | -0.044*** |
| | | | | | | | | | | | [-2.61] | [48.38] | [-1.70] | [-2.62] | [-2.87] |
| *SIZE* | 0.007*** | -0.046*** | 0.996*** | 0.008*** | 0.026*** | 0.007*** | -0.038*** | 1.004*** | 0.008*** | 0.025*** | 0.007*** | -0.042*** | 1.002*** | 0.008*** | 0.025*** |
| | [8.27] | [-24.37] | [33.79] | [15.90] | [20.76] | [8.31] | [-20.33] | [34.32] | [15.72] | [20.57] | [8.33] | [-22.57] | [33.79] | [15.79] | [20.60] |
| *BOOK EQUITY* | 0.267*** | | -1.523 | 0.027*** | 0.114*** | 0.268*** | | -1.361 | 0.024** | 0.107*** | 0.269*** | | -1.383 | 0.025** | 0.108*** |
| | [12.26] | | [-0.85] | [2.63] | [4.48] | [12.31] | | [-0.77] | [2.41] | [4.22] | [12.32] | | [-0.78] | [2.45] | [4.26] |
| *DEPOSIT_RATIO* | -0.149*** | 0.145*** | -0.938*** | -0.004 | -0.012 | -0.149*** | 0.160*** | -0.894*** | -0.005 | -0.013 | -0.149*** | 0.108*** | -0.899*** | -0.005 | -0.013 |
| | [-16.69] | [7.97] | [-2.81] | [-0.99] | [-1.15] | [-16.67] | [8.89] | [-2.69] | [-1.07] | [-1.25] | [-16.65] | [5.90] | [-2.71] | [-1.03] | [-1.20] |
| *LIQUIDITY_RATIO* | 0.000*** | 0 | 0.011*** | 0 | 0 | 0.000*** | 0.000*** | 0.010*** | 0 | 0 | 0.000*** | 0.000*** | 0.011*** | 0 | 0 |
| | [4.62] | [0.71] | [3.89] | [1.15] | [-0.22] | [4.57] | [3.58] | [3.88] | [1.24] | [-0.10] | [4.57] | [3.01] | [3.88] | [1.26] | [-0.10] |
| *COST_EFFICIENCY* | 0.260*** | -0.744*** | 0.888*** | 0.009*** | 0.036*** | 0.260*** | -0.706*** | 0.911*** | 0.009*** | 0.035*** | 0.260*** | -0.720*** | 0.906*** | 0.009*** | 0.036*** |
| | [29.14] | [-43.31] | [5.52] | [2.82] | [4.30] | [29.15] | [-41.45] | [5.65] | [2.72] | [4.17] | [29.15] | [-42.16] | [5.60] | [2.78] | [4.23] |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *REV_DIV* | -0.040*** | -0.592*** | -0.28 | 0.013*** | 0.041*** | -0.040*** | -0.667*** | -0.283 | 0.015*** | 0.046*** | -0.040*** | -0.625*** | -0.309 | 0.014*** | 0.045*** |
| | [-4.40] | [-30.02] | [-1.30] | [3.20] | [4.06] | [-4.36] | [-33.85] | [-1.32] | [3.69] | [4.55] | [-4.43] | [-31.65] | [-1.44] | [3.55] | [4.42] |
| *ECON_DEV* | -0.000* | 0 | 0.001 | -0.000*** | -0.000* | 0 | -0.000*** | 0.004 | -0.000*** | -0.000* | -0.000* | -0.001*** | 0.002 | -0.000*** | -0.000* |
| | [-1.87] | [-0.56] | [0.61] | [-2.80] | [-1.78] | [-1.25] | [-4.13] | [1.49] | [-2.65] | [-1.74] | [-1.82] | [-11.82] | [1.03] | [-2.77] | [-1.81] |
| *GDP_GROWTH* | -0.003*** | -0.029*** | -0.036** | -0.001*** | -0.003*** | -0.003*** | -0.021*** | -0.02 | -0.001** | -0.002*** | -0.003*** | -0.020*** | -0.029* | -0.001** | -0.002*** |
| | [2.77] | [-14.86] | [-2.30] | [-2.92] | [-3.13] | [2.87] | [-11.01] | [-1.20] | [-2.43] | [-2.61] | [2.70] | [-10.12] | [-1.82] | [-2.57] | [-2.74] |
| Observations | 151,548 | 151,153 | 3,182 | 4,804 | 4,804 | 151,548 | 151,153 | 3,182 | 4,804 | 4,804 | 151,548 | 151,153 | 3,182 | 4,804 | 4,804 |
| Country FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.065 | 0.0686 | 0.707 | 0.298 | 0.387 | 0.0651 | 0.0804 | 0.707 | 0.293 | 0.381 | 0.065 | 0.0794 | 0.707 | 0.294 | 0.381 |

*Notes:* In this table, we regress five measures of bank risk: interest income volatility (*STD_NIM*), Z-index (*ZSCORE*), systemic risk (SRISK), marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR) on alternative measures of press freedom (*Legal_Score*, *Political_Score* and *Overall_Score*) from the annual freedom of the Press (FOTP) survey, published by the Freedom House in columns (1)-(15), respectively. We include bank size (*SIZE*), equity to total assets ratio (*BOOKEQUITY*), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (*COST_EFFICIENCY*), revenue diversification (*REV_DIV*), private credit to GDP ratio (*ECON_DEV*) and GDP growth ratio (GDP_RATIO). All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

## Table 5 Excluding US Observations

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | *STD_NIM* | *ZSCORE* | *SRISK* | *MES_1%VAR* | *MES_5%VAR* |
| *PRESS_FREEDOM* | -0.008 | 0.249*** | -0.125** | -0.012*** | -0.028*** |
| | [-1.54] | [36.23] | [-1.97] | [-8.97] | [-8.52] |
| *SIZE* | 0.012*** | -0.087*** | 1.005*** | 0.008*** | 0.025*** |
| | [9.63] | [-32.12] | [34.06] | [18.30] | [23.59] |
| *BOOKEQUITY* | 0.333*** | | -0.247 | 0.025** | 0.104*** |
| | [12.77] | | [-0.16] | [2.54] | [4.19] |
| *DEPOSIT_RATIO* | -0.148*** | 0.205*** | -0.858*** | -0.003 | -0.01 |
| | [-16.42] | [10.94] | [-2.68] | [-0.81] | [-1.00] |
| *LIQUIDITY_RATIO* | 0.000*** | 0.0002 | 0.007*** | 0.000* | 0.0002 |
| | [2.78] | [-1.49] | [3.51] | [1.88] | [0.59] |
| *COST_EFFICIENCY* | 0.277*** | -0.680*** | 0.895*** | 0.008** | 0.033*** |
| | [19.88] | [-29.51] | [5.93] | [2.55] | [4.48] |
| *REV_DIV* | -0.015 | -0.647*** | -0.510*** | 0.007* | 0.023*** |
| | [-1.32] | [-28.39] | [-2.61] | [1.90] | [2.58] |
| *ECON_DEV* | 0.0001 | 0.004*** | 0.002 | 0.0001 | 0.0001 |
| | [0.52] | [26.94] | [1.30] | [-0.58] | [0.56] |
| *GDP_GROWTH* | 0.003*** | -0.009*** | -0.030** | -0.002*** | -0.004*** |
| | [2.77] | [-4.33] | [-2.26] | [-5.19] | [-4.81] |
| Observations | 81,863 | 81,565 | 3,054 | 3,656 | 3,656 |
| Country FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.0779 | 0.107 | 0.759 | 0.332 | 0.408 |

*Notes*: In this table, we regress five measures of bank risk: interest income volatility (STD_NIM), Z-index (ZSCORE), systemic risk (SRISK), marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR) on press freedom, once observations from the banks operating in the US are excluded in columns (1)-(5), respectively. We include bank size (SIZE), equity to total assets ratio (BOOKEQUITY), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (COST_EFFICIENCY), revenue diversification (REV_DIV), private credit to GDP ratio (ECON_DEV) and GDP growth ratio (GDP_RATIO). All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

## Table 6 Controlling for institutional factors

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | *STD_NIM* | *ZSCORE* | *SRISK* | *MES_1%VAR* | *MES_5%VAR* |
| *PRESS_FREEDOM* | -0.015*** | -0.019* | -0.115 | -0.012*** | -0.028*** |
| | [-3.06] | [-1.70] | [-1.55] | [-8.80] | [-8.14] |
| *SIZE* | 0.008*** | -0.047*** | 1.022*** | 0.008*** | 0.026*** |
| | [10.84] | [-25.41] | [36.21] | [19.29] | [24.21] |
| *BOOKEQUITY* | 0.260*** | | -2.77 | 0.026*** | 0.104*** |
| | [12.66] | | [-1.37] | [2.72] | [4.21] |
| *DEPOSIT_RATIO* | -0.145*** | 0.212*** | -1.308*** | -0.003 | -0.01 |
| | [-17.23] | [11.70] | [-3.84] | [-0.77] | [-1.04] |
| *LIQUIDITY_RATIO* | 0.000*** | 0.0001 | 0.011*** | 0.0001 | 0.0001 |
| | [4.92] | [1.08] | [4.18] | [1.64] | [0.51] |
| *COST_EFFICIENCY* | 0.272*** | -0.735*** | 0.961*** | 0.010*** | 0.037*** |
| | [30.11] | [-44.11] | [5.77] | [3.19] | [4.87] |
| *REV_DIV* | -0.056*** | -0.615*** | -0.18 | 0.005 | 0.016* |
| | [-6.22] | [-31.81] | [-0.85] | [1.42] | [1.71] |
| *ECON_DEV* | 0.0001 | -0.003*** | 0.002 | 0.000** | 0.000*** |
| | [0.43] | [-27.58] | [0.97] | [2.02] | [3.10] |
| *GDP_GROWTH* | 0.003** | -0.031*** | -0.028** | -0.001*** | -0.002*** |
| | [2.37] | [-15.35] | [-2.01] | [-3.96] | [-3.21] |
| VAE | 0.082*** | -0.365*** | -0.671** | 0.009** | 0.031*** |
| | [4.51] | [-25.47] | [-1.97] | [2.22] | [3.28] |
| PVE | 0.041*** | 0.011 | 0.055 | -0.008*** | -0.024*** |
| | [4.40] | [1.01] | [0.43] | [-2.61] | [-3.49] |
| GEE | 0.050*** | 0.019 | -0.067 | -0.002 | 0.003 |
| | [3.43] | [0.72] | [-0.28] | [-0.49] | [0.26] |
| RQE | -0.021 | 0.283*** | -0.203 | -0.011*** | -0.020* |
| | [-1.60] | [13.97] | [-0.93] | [-2.60] | [-1.88] |
| RLE | -0.069*** | 0.043* | 0.266 | -0.005 | -0.01 |
| | [-3.48] | [1.66] | [0.86] | [-0.84] | [-0.69] |
| CCE | -0.017 | 0.415*** | -0.324 | 0.011** | 0.019* |
| | [-1.31] | [20.00] | [-1.41] | [2.55] | [1.78] |
| Observations | 161,933 | 161,556 | 3,360 | 5,418 | 5,418 |
| Country FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.0627 | 0.0987 | 0.731 | 0.352 | 0.426 |

*Notes*: In this table, we regress five measures of bank risk: interest income volatility (STD_NIM), Z-index (ZSCORE), systemic risk (SRISK), marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR) on press freedom, controlling for different institutional factors including the voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and the control of corruption in a particular country in columns (1)-(5), respectively. We include bank size (SIZE), equity to total assets ratio (BOOKEQUITY), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (COST_EFFICIENCY), revenue diversification (REV_DIV), private credit to GDP ratio (ECON_DEV) and GDP growth ratio (GDP_RATIO). All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

## Table 7 Controlling for the Human Development Index

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | *STD_NIM* | *ZSCORE* | *SRISK* | *MES_1%VAR* | *MES_5%VAR* |
| *PRESS_FREEDOM* _HDI | -0.036 | 1.938*** | 0.569 | -0.047** | -0.134** |
| | [-0.67] | [20.50] | [0.63] | [-2.03] | [-2.30] |
| HDI | -1.208*** | 7.815*** | -0.738 | -0.513*** | -1.393*** |
| | [-4.75] | [24.72] | [-0.18] | [-5.50] | [-6.02] |
| *PRESS_FREEDOM* | 0.025 | -1.700*** | -0.541 | 0.035* | 0.105** |
| | [0.52] | [-19.96] | [-0.69] | [1.75] | [2.10] |
| *SIZE* | 0.008*** | -0.044*** | 1.009*** | 0.009*** | 0.027*** |
| | [9.25] | [-21.70] | [33.25] | [18.18] | [22.26] |
| *BOOKEQUITY* | 0.264*** | | -2.201 | 0.032*** | 0.125*** |
| | [11.97] | | [-1.12] | [3.22] | [4.98] |
| *DEPOSIT_RATIO* | -0.146*** | 0.247*** | -1.274*** | -0.007* | -0.019* |
| | [-15.97] | [12.44] | [-3.49] | [-1.65] | [-1.77] |
| *LIQUIDITY_RATIO* | 0.000*** | 0.000** | 0.010*** | 0.0001 | 0.0001 |
| | [4.51] | [2.26] | [3.82] | [1.25] | [-0.15] |
| *COST_EFFICIENCY* | 0.265*** | -0.719*** | 0.879*** | 0.013*** | 0.045*** |
| | [28.25] | [-40.61] | [5.09] | [4.26] | [5.62] |
| *REV_DIV* | -0.047*** | -0.647*** | -0.245 | 0.003 | 0.016 |
| | [-4.92] | [-31.27] | [-1.04] | [0.65] | [1.60] |
| *ECON_DEV* | 0.0001 | -0.003*** | 0.003 | 0.000** | 0.000*** |
| | [-0.45] | [-23.63] | [0.88] | [2.09] | [3.31] |
| *GDP_GROWTH* | 0.002 | -0.026*** | -0.032* | 0.0001 | 0.0001 |
| | [1.44] | [-11.22] | [-1.72] | [0.01] | [0.15] |
| Observations | 139,566 | 139,209 | 2,885 | 4,434 | 4,434 |
| Country FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.064 | 0.103 | 0.721 | 0.341 | 0.431 |

*Notes*: In this table, we regress five measures of bank risk: interest income volatility (STD_NIM), Z-index (ZSCORE), systemic risk (SRISK), marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR) on press freedom, controlling for the interaction between the media freedom variable and the human development index in columns (1)-(5), respectively. We include bank size (SIZE), equity to total assets ratio (BOOKEQUITY), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (COST_EFFICIENCY), revenue diversification (REV_DIV), private credit to GDP ratio (ECON_DEV) and GDP growth ratio (GDP_RATIO). All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

**Table 8 Interaction with state ownership**

| | (1) *STD_NIM* | (2) *ZSCORE* | (3) *SRISK* | (4) *MES_1%VAR* | (5) *MES_5%VAR* |
|---|---|---|---|---|---|
| *PRESS_FREEDOM**STATE_SHARE | 0.023*** | 0.021 | 0.187 | 0.016*** | 0.039*** |
| | [4.21] | [1.69] | [0.73] | [3.41] | [3.36] |
| *PRESS_FREEDOM* | -0.019*** | 0.244*** | -0.21 | -0.020*** | -0.048*** |
| | [-3.65] | [22.25] | [-1.60] | [-7.09] | [-6.95] |
| STATE_SHARE | 0.133** | 0.646*** | 1.882 | 0.074** | 0.119* |
| | [2.44] | [16.81] | [0.98] | [2.50] | [1.67] |
| *SIZE* | 0.008*** | -0.053*** | 1.016*** | 0.008*** | 0.025*** |
| | [10.52] | [-30.02] | [37.86] | [18.93] | [24.03] |
| *BOOKEQUITY* | 0.260*** | | -1.879 | 0.028*** | 0.106*** |
| | [12.83] | | [-1.02] | [2.92] | [4.32] |
| *DEPOSIT_RATIO* | -0.140*** | 0.296*** | -1.155*** | -0.002 | -0.008 |
| | [-17.28] | [17.18] | [-3.70] | [-0.53] | [-0.87] |
| *LIQUIDITY_RATIO* | 0.0001*** | 0.0001 | 0.011*** | 0.0001* | 0.0001 |
| | [4.92] | [0.73] | [4.12] | [1.68] | [0.68] |
| *COST_EFFICIENCY* | 0.270*** | -0.731*** | 0.942*** | 0.008*** | 0.032*** |
| | [30.71] | [-45.09] | [5.89] | [2.66] | [4.40] |
| *REV_DIV* | -0.055*** | -0.651*** | -0.326 | 0.007* | 0.024*** |
| | [-6.25] | [-34.69] | [-1.60] | [1.95] | [2.70] |
| *ECON_DEV* | 0.0001 | 0.003*** | 0.003 | 0.0001 | 0.0001 |
| | [-1.36] | [33.96] | [1.43] | [-0.78] | [0.32] |
| *GDP_GROWTH* | 0.002** | -0.016*** | -0.030** | -0.001*** | -0.003*** |
| | [2.39] | [-8.70] | [-2.20] | [-4.62] | [-4.18] |
| Observations | 170,227 | 169,815 | 3,549 | 5,592 | 5,592 |
| Country FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.0638 | 0.0884 | 0.717 | 0.346 | 0.421 |

*Notes*: In this table, we regress five measures of bank risk: interest income volatility (STD_NIM), Z-index (ZSCORE), systemic risk (SRISK), marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR) on press freedom, controlling for the interaction between the media freedom variable and media state ownership in columns (1)-(5), respectively. We include bank size (SIZE), equity to total assets ratio (BOOKEQUITY), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (COST_EFFICIENCY), revenue diversification (REV_DIV), private credit to GDP ratio (ECON_DEV) and GDP growth ratio (GDP_RATIO). All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

## Table 9 Developed and developing countries

| | (1) *STD_NIM* | (2) *ZSCORE* | (3) *SRISK* | (4) *MES_1%VAR* | (5) *MES_5%VAR* |
|---|---|---|---|---|---|
| *PRESS_FREEDOM*_DEVELOPED | -0.002 | 0.796*** | -0.270* | -0.031*** | -0.092*** |
| | [-0.11] | [36.69] | [-1.80] | [-6.95] | [-8.48] |
| *PRESS_FREEDOM* | -0.004 | -0.466*** | 0.058 | 0.010** | 0.035*** |
| | [-0.23] | [-22.10] | [0.37] | [2.36] | [3.26] |
| DEVELOPED | -0.119 | 3.169*** | -1.914 | -0.158*** | -0.460*** |
| | [-1.46] | [40.01] | [-1.25] | [-5.25] | [-6.33] |
| *SIZE* | 0.009*** | -0.039*** | 1.018*** | 0.008*** | 0.025*** |
| | [11.19] | [-20.18] | [33.22] | [16.95] | [23.23] |
| *BOOKEQUITY* | 0.264*** | | -1.928 | 0.023** | 0.110*** |
| | [11.71] | | [-0.80] | [2.21] | [4.21] |
| *DEPOSIT_RATIO* | -0.141*** | 0.283*** | -0.771** | -0.002 | -0.002 |
| | [-15.79] | [14.89] | [-2.12] | [-0.38] | [-0.18] |
| *LIQUIDITY_RATIO* | 0.000*** | 0.000*** | 0.015*** | 0.0001*** | 0.0001 |
| | [4.63] | [3.24] | [4.79] | [2.79] | [0.93] |
| *COST_EFFICIENCY* | 0.285*** | -0.726*** | 1.231*** | 0.005 | 0.025*** |
| | [27.47] | [-39.10] | [6.29] | [1.25] | [2.91] |
| *REV_DIV* | -0.062*** | -0.610*** | -0.467* | 0.001 | 0.005 |
| | [-6.30] | [-29.54] | [-1.85] | [0.26] | [0.52] |
| *ECON_DEV* | 0.0001 | -0.0001** | 0.003 | 0.0001 | 0.0001 |
| | [-0.35] | [-1.97] | [1.55] | [-1.52] | [-0.55] |
| *GDP_GROWTH* | 0.003** | -0.010*** | -0.021 | -0.002*** | -0.005*** |
| | [2.26] | [-4.26] | [-1.28] | [-5.58] | [-5.55] |
| Observations | 141,912 | 141,600 | 2,869 | 4,764 | 4,764 |
| Country FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Adjusted R-squared | 0.0648 | 0.092 | 0.734 | 0.334 | 0.406 |

*Notes*: In this table, we regress five measures of bank risk: interest income volatility (STD_NIM), Z-index (ZSCORE), systemic risk (SRISK), marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR) on press freedom, controlling for the interaction between the media freedom variable and the level of development of the countries in the sample in columns (1)-(5), respectively. We include bank size (SIZE), equity to total assets ratio (BOOKEQUITY), deposit to total assets ratio (DEPOSIT_RATIO), asset liquidity ratio (LIQUIDITY_RATIO), cost to income ratio (COST_EFFICIENCY), revenue diversification (REV_DIV), private credit to GDP ratio (ECON_DEV) and GDP growth ratio (GDP_RATIO). All continuous variables are winsorised at 1% levels and defined in Appendix A1. In all regressions, we include country and year fixed effects. Beneath each coefficient is the robust t -statistic. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

## Table 10 Path Analysis: Depositor Discipline

| | ZSCORE | | SRISK | | MES_1%VAR | | MES_5%VAR | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | Coeff. | *p*-value | Coeff. | *p*-value | Coeff. | *p*-value | Coeff. | *p*-value |
| **Direct Path** | | | | | | | | |
| P (Press Freedom, Bank Stability) | 0.283 | 0.000 | -0.127 | 0.059 | -0.026 | 0.000 | -0.011 | 0.000 |
| **Indirect Path** | | | | | | | | |
| P (Press Freedom, Depositor Discipline) | 0.011 | 0.003 | 0.022 | 0.003 | 0.242 | 0.000 | 0.242 | 0.000 |
| P (Depositor Discipline, Bank Stability) | 0.015 | 0.005 | -0.013 | 0.031 | -0.004 | 0.000 | -0.001 | 0.002 |
| P (Press Freedom, Depositor Discipline) ×P (Depositor Discipline, Bank Stability) | 0.023 | 0.000 | -0.014 | 0.010 | -0.001 | 0.000 | -0.000 | 0.005 |
| Total effect | 0.316 | 0.000 | -0.113 | 0.021 | -0.026 | 0.000 | -0.011 | 0.000 |
| Mediated % in Total | 8.1% | | 11.02% | | 4.3% | | 3% | |
| Observations | 179,829 | | 3,599 | | 6,266 | | 6,266 | |

*Notes*: This table reports the direct and indirect path through which press freedom can affect bank stability. Bank stability is measured by ZSCORE, systemic risk (SRISK) and marginal expected shortfall using 1%VAR (MES_1%VAR) and marginal expected shortfall using 5%VAR (MES_5%VAR). Press freedom values are from the Press freedom index published by RSF. The path is depositor discipline which is measured by *Depositor Discipline* which is the first difference of the log of deposits for bank *i* in period *t.* Please see Table A1 for detailed variable definitions of all other variables. We control for country and year fixed effects across all models. Standard errors are clustered by both country and year and are reported in parentheses. ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.

**Table A.1 Variable definitions**

| Variables | Acronym | Description |
|---|---|---|
| Media Freedom | *PRESS_FREEDOM* | The index covers a wide range of aspects related to media freedom including, but not limited to, violations affecting media, the ability of the media to investigate and criticize, the level of financial pressure faced by the media, the legal framework or the regulations related to the media, violations of the free flow of information on the internet and the level of independence of the media. |
| Z-Score | ZSCORE | Bank stability measured by the Z-Score |
| Marginal Expected Shortfall | *MES_1%VAR* | Marginal expected shortfall using 1%VAR |
| Marginal Expected Shortfall | *MES_5%VAR* | Marginal expected shortfall using 5%VAR |
| Systematic risk measure | SRISK | Expected capital shortfall of a bank conditional on a prolonged market decline |
| Interest income volatility | *STD_NIM* | Standard deviation of net interest margin |
| Bank size | *SIZE* | Natural logarithm of bank total assets |
| Bank equity ratio | *BOOKEQUITY* | Equity to total assets ratio |
| Bank deposit ratio | *DEPOSIT_RATIO* | Deposit to total assets ratio |
| Asset liquidity ratio | *LIQUIDITY_RATIO* | Liquid assets to deposits and short-term funding ratio |
| Cost to income ratio | *COST_EFFICIENCY* | Ratio of total cost to total income |
| Revenue diversification | *REV_DIV* | Non-interest income to total operating revenue ratio |
| Economic Development | *ECON_DEV* | Private credit to GDP ratio |
| GDP growth | *GDP_GROWTH* | Growth in real GDP |
| Predicted values of media freedom variable | PRE_PRESSFREE_OIL | Predicted values of media freedom variable using oil reserves as the instrumental variable |
| Predicted values of media freedom variable | PRE_PRESSFREE_INDEPYR | Predicted values of media freedom variable using percentage of years that a particular country has been independent since 1776 as the instrumental variable |
| State ownership of media | STATE_SHARE | A dummy equal to one if the top radio station is state owned, and zero otherwise. |
| Alternative measures of media freedom | LEGAL_ SCORE, POLITICAL_ SCORE, TOTAL_ SCORE | Legal score, political score and total score which mainly reflect the legal and political pressures and economic factors that affect media content and freedom |
| Level of development of countries | DEVELOPED | Dummy variable which takes a value of 1 for developed countries, 0 otherwise |
| Sub-component of the quality of the regulatory and institutional environment of the countries | VAE | Voice and Accountability |

| | | |
|---|---|---|
| Sub-component of the quality of the regulatory and institutional environment of the countries | PVE | Political stability and absence of violence |
| Sub-component of the quality of the regulatory and institutional environment of the countries | GEE | Government Effectiveness |
| Sub-component of the quality of the regulatory and institutional environment of the countries | RQE | Regulatory quality |
| Sub-component of the quality of the regulatory and institutional environment of the countries | RLE | Rule of law |
| Sub-component of the quality of the regulatory and institutional environment of the countries | CCE | Control of corruption |
| Human development index | HDI | The Human Development Index measures three key dimensions of human development including life expectancy, access to education and standards of living. |