HOW DO DEPOSITORS RESPOND TO BANK DIVIDEND POLICY? EVIDENCE FROM MARKET DISCIPLINE, GLOBAL FINANCIAL CRISIS AND COVID-19 PANDEMIC

Dung Viet Tran

*Banking Academy of Vietnam, State Bank of Vietnam,
12, Chua Boc Street, Dong Da District, Hanoi, Vietnam*

E-mail: tranvietdung.hvnh@gmail.com

ABSTRACT

This study investigates how depositors respond to the bank dividend policy via the interest rate channel. The results suggests that by paying dividend, banks mitigate the information asymmetry between insiders and outsiders, then enjoying a lower deposit cost than banks that do not pay dividend. Dividend-paying banks that are subject to higher funding costs may enjoy a greater decrease of funding costs than non-payers. Banks that are under greater pressure from regulators, but encounter losses have to pay higher deposit costs when deciding to pay dividend. The study emphasises the downside of deposit insurance scheme when documenting the indifference of insured but uninsured depositors during the global financial crisis, but the COVID-19 crisis, suggesting the wake-up calls for depositors.

Keywords: Dividend policy, banks, market discipline, deposit insurance, financial crisis, COVID-19

INTRODUCTION

Banks become increasingly more complex and opaquer. Financial innovation coupled with the increasing concentration of financial markets represent challenges

to understaffed supervisors and market participants to accurately assess the bank's balance sheets and income statements. The financial crisis of 2007–2009 and the subsequent failures of banks around the world raise the question on whether there still exists the market discipline (Acharya et al., 2013). An important problem related to the market discipline is that this monitoring mechanism is generally deployed ex-post with the fund withdrawal and in extreme case the bank runs, rather than ex-ante with the adjustment of funding costs. The market discipline would be more efficient if the price of bank liabilities correctly incorporates full and qualitative information of bank credit risks proprieties, and then reflects the fair yield for risks (Ellis & Flannery, 1992). There exists a large literature on the market discipline in the banking literature, most of them however focus on the bank risk-taking behaviours without final conclusions (Bliss, 2004; Bliss & Flannery, 2002; Ashcraft, 2008; Baele et al., 2014; among others).

This study provides a new perspective to assess the market discipline via the responsiveness of depositors toward the bank dividend policy. Dividend policy is recognised in literature as a mean to convey private information not previously known to outsiders. It is a signal to the quality of banks (Boldin & Leggett, 1995). This is a costly signal with purpose to change perception in the markets and to attenuate the conflicts arising from incomplete contracts. However, dividend policy can be used to transfer the wealth from bondholders (and, potentially taxpayers) to shareholders. These characteristics of dividends may imply high heterogeneity on the perception of market participants, and consequently market discipline. This study also provides evidence of two critical issues related to the market discipline: (i) the interplay between market discipline and deposit insurance scheme, (ii) the effects of the crisis on market discipline.

Theoretically, banks that pay dividends can enjoy a lower funding cost. Banks that pay dividends need to access more frequently to the capital markets to raise funds than nonpayers, leading consequently to closer scrutiny of management by outsiders (Tran & Ashraf, 2018). This induces a better alignment between mangers and bank stakeholders, and fewer chances for managers to misrepresent the reported information, and take excessive risk, lowering the required premium from funds providers. Furthermore, due to the inherent opacity, bank insiders dispose more informed and valuable private information than outsiders. The nature fragility of the funding structure (Diamond, 1984) makes banks fell it is necessary to rely on dividends to signal their financial health to outsiders, allowing outsiders to make better and more informed decisions on allocating their funds between good and bad banks (Tripathy et al., 2021).

Empirically, I investigate how bank funding costs differs between dividend-paying banks and non-payers. I mainly focus on the deposit costs since deposits consists of the main part (80%) of bank liabilities which may be quickly blown down if depositors cast doubt on the quality of bank assets. Similar to other types of bank creditors, depositors require higher deposit rates when facing increased bank risk taking. However, the incentive for depositors to monitor banks depends upon the extent to which their deposits are insured either implicitly or explicitly (Wu & Bowe, 2012). The effectiveness of the depositor discipline depends on their ability to fully understand and accurately assess the bank publicly disclosed information – which is not homogeneous for all depositors. That is why, unlike other studies, I rely on the status of bank dividend policy which is a simple indicator that all economic agents can understand. Relying on the most updated data of the U.S. bank sample, the results show that bank that pay dividends enjoy lower deposits costs than non-payers. Through paying dividend, banks send a costly signal to outsiders about their confidence on financial health, which mitigates the information asymmetry between better informed insiders and outsiders, consequently, reduces the bank funding costs. It means that depositors require lower deposit rates when banks commit to signal more private information to outsiders. The evidence suggests the existence of the depositor discipline and supports for the view that depositors differentiate between banks according to their quality. Additionally, the study provides consistent evidence for the conjecture that the cost-enhancing effects of dividend policy is more pronounced for higher-funding costs banks, i.e., banks that are facing serious information asymmetry with outsiders. My main findings remain unchanged with a range of robustness tests such as alternative measures of dividend policy and funding costs, alternative econometric approaches to deal with the endogeneity concerns.

This study documents banks under high pressure from regulators can lower their deposit costs by paying dividends. However, depositors consider the decision to pay dividend of banks under high regulatory pressure that encounter losses as a mean to shift the relative value of claims among bank's stakeholders, then consequently require higher deposit rates. The evidence strengthens my postulation of the existence of depositor discipline during the period of study.

This study also provides evidence whether the depositor responsiveness changes under difference circumstances: the deposit insurance scheme and the crisis. I observe that there is evidence of the market discipline from uninsured, but insured depositors during the global financial crisis. However, during the COVID-19 pandemics, both types of depositor's behave homogeneously since they all value differently the banks that does and does not pay dividends.

I contribute to the literature in different ways. First, unlike previous studies which mostly focus on bank risk taking, I adopt a "fresh" perspective to assess the market discipline in the banking industry via the responsiveness of depositors. I document consistent evidence of a lower deposit costs for banks that pay dividends, suggesting the existence of market discipline. Second, I provide evidence of critical issues related to the market discipline: (i) the relation between market discipline and deposit insurance scheme, and (ii) how this relation varies during the trying times. The study emphasises the downside of deposit insurance scheme when documenting the indifference of insured but uninsured depositors during the global financial times. During the COVID-19 pandemic, I document the market discipline for all types of depositors, since both insured and uninsured depositors' value differently the banks that does and does not pay dividends.

DATA, VARIABLES AND EMPIRICAL STRATEGY

I retrieve U.S. bank data from the quarterly Y-9C of the Federal Reserves. My data lasts from 2001:Q1 to 2021:Q4. I remove any missing or incomplete data. All financial ratios are winsorised at 1% level on the top and bottom of their distribution to dampen the effects of outliers.

Following Gilje et al. (2016), and Acharya and Mora (2015), for the proxy of bank funding costs, I use the (domestic) cost of deposits (DC) which is the interest expense on deposits during a quarter over the deposits. For my main variable of interest, following Tran and Ashraf (2018), I use the dummy variable which is equal to 1 if bank pays dividends at quarter *t*, and 0 otherwise. The funding costs of dividend-paying banks and dividend non-paying banks are plotted in Figure 1. I observe that the dividend-paying banks pay lower deposit costs than dividend non-paying banks.

I control for several time-varying bank characteristics, such as capital ratio (CAPITAL), bank size (SIZE), bank performance (EARNINGS) and (LOSS), growth opportunities (GROWTH) and bank business models (NII). Table 1 presents the definitions of all main variables used in the analysis. The summary statistics for the main sample of U.S. banks used in the analysis. All financial variables are winsorized at 1% and 99% levels are shown in Table 2. Panels A and B of Table 2 reports the summary descriptive of these variables. Panel C of Table 2 reports the univariate tests between dividend-paying banks and non-dividend paying banks. Dividend paying banks are on average better capitalised, better performed and larger than dividend nonpaying banks. The former tends to diversify more towards non-traditional banking activities and accounts more losses than the later.
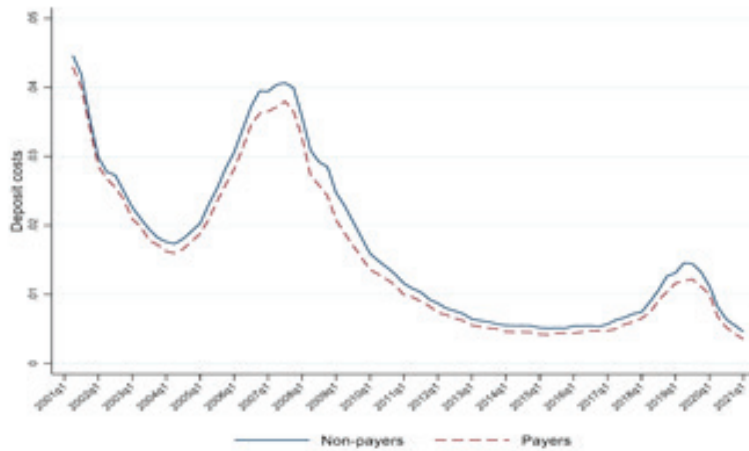
Figure 1: Funding costs over the quarters

Table 1
Variables definitions

Variable	Definition
Dependent variables	
DC	The cost of (domestic) deposits equals the ratio of interest expenses on domestic deposits over interest-bearing domestic deposits at the beginning of a period
Variable of interest	
DIV	A dummy variable that takes a value of one if the bank i pays dividend at time t, and 0 otherwise
Control variables	
CAPITAL	The total equity capital divided by the gross total assets
SIZE	The natural logarithm of the gross total assets
LOSS	A dummy variable that equals one if net income is negative, and 0 otherwise
EARNINGS	Income before taxes, provisions recognised in income over gross total assets
GROWTH	Growth rate of gross total assets
NII	Non-interest incomes over the net operating incomes
TFE	Time fixed effects

Table 2
Summary statistics

Panel A

Variable	N	Mean	S.D.	Min	Max
DC	79,492	0.018	0.012	0.001	0.050
DIV	79,492	0.523	0.499	0.000	1.000
SIZE	79,492	13.871	1.496	11.941	19.414
CAPITAL	79,492	0.095	0.031	0.031	0.227
EARNINGS	79,492	0.003	0.008	−0.020	0.024
GROWTH	79,492	0.020	0.043	−0.082	0.222
NII	79,492	0.227	0.140	−0.022	0.846
DUM_LOSS	79,492	0.222	0.415	0.000	1.000

Panel B

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) DC	1.000							
(2) DIV	−0.015***	1.000						
(3) SIZE	−0.306***	0.102***	1.000					
(4) CAPITAL	−0.209***	0.042***	0.144***	1.000				
(5) EARNINGS	0.047***	0.449***	−0.001	0.061***	1.000			
(6) GROWTH	0.093***	0.008***	0.017***	-0.061***	0.046***	1.000		
(7) NII	−0.127***	0.060***	0.352	0.104***	0.034***	0.000	1.000	
(8) DUM_LOSS	−0.046***	−0.416***	0.022***	−0.038***	−0.748***	−0.060***	−0.003	1.000

Panel C: Univariate tests

Variable	Mean			Median		
	Non-payers (1)	Payers (2)	t-test (3) = (1)–(2)	Non-payers (1)	Payers (2)	Wilconxin test (3) = (1)–(2)
DC	0.0189	0.0185	0.0003***	0.0173	0.0176	0.0003***
SIZE	13.7112	14.0214	−0.3102***	13.4351	13.6553	−0.2182***
CAPITAL	0.0943	0.0970	−0.0027***	0.0897	0.0933	−0.0036***
EARNINGS	−0.0011	0.0061	−0.0072***	0.0021	0.0046	−0.0025***
GROWTH	0.0193	0.0061	0.0007**	0.0134	0.0146	−0.0012***
NII	0.2211	0.2385	−0.0174***	0.1909	0.2129	−0.022***
LOSS	0.3827	0.0428	0.3399***	0.0000	0.0000	−0.0036***

The empirical specification is as follows:

$$Y_{it} = \alpha + DIV_{it-1} + Z_{it-1} + \theta_t + \varepsilon_{it} \tag{1}$$

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where, Y_{it} is the measure of funding costs of bank i at time t. I use the deposit costs of bank i at time t (DC) as the main proxy. DIV_{it-1} is the dummy of dividend defined above. I also use alternative measures for these two variables in the next sections. Z_{it} is the vector of control variables. I include the time fixed effects in all specifications to control for the macroeconomics variation. All explanatory variables are lagged of one period to control for the intra-period reverse causality. I also test for further lagged periods in unreported tests and obtain similar results. Because bias from within-group correlation exists in the sample, the standard errors are corrected for heteroskedasticity and adjusted for clustering at the bank level (Petersen, 2009).

How Do Depositors Respond to Bank Dividend Policy?

I report my baseline regressions in Table 3. In Model 1, my baseline model documents a negative and statistically significant coefficient of DIV on DC, suggesting dividend-paying banks enjoy lower deposit costs than non-payers. In Model 2, I lag the variable of interest, DIV, of eight periods instead of one period. In unreported tests, I also lag different periods. I find similar findings. Since banks are more likely to manage their numbers at the end-year fiscal quarter (Liu et al., 1997) which may affect the bank dividend policy (Tran & Ashraf, 2018), I then perform my baseline model using sample with only data of the 4th quarter in Model 3. I obtain similar results. Economically, based on the results in Model 1, the deposit costs of dividend-paying banks are 6.09% lower than those of non-payers.

Table 3
Baseline multivariate analysis

Variable	Y = DC (DEPOSIT COSTS)			Alternative cost measures			Alternative dividend measures		
	Baseline model	Lag of 8 periods	Only 4th quarters	COSTFUND	RDC	LTPAYER	DIVIDEND/ASSETS	REPUR_D	REPUR_NOD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DIV	-0.00111***	-0.00103***	-0.00120***	-0.00123***	-0.00073***	-0.00120***	-0.03915***	-0.00074***	-0.00036**
	(0.00013)	(0.00013)	(0.00015)	(0.00015)	(0.00014)	(0.00015)	(0.00494)	(0.00017)	(0.00015)
SIZE	-0.00045***	-0.00028***	-0.00042***	-0.00009	0.00011	-0.00040***	-0.00050***	-0.00045***	-0.00048***
	(0.00007)	(0.00007)	(0.00007)	(0.00009)	(0.00008)	(0.00007)	(0.00007)	(0.00007)	(0.00007)
CAPITAL	-0.01612***	-0.01750***	-0.01379***	-0.02588***	-0.03163***	-0.01624***	-0.01620***	-0.01607***	-0.01617***
	(0.00297)	(0.00323)	(0.00298	(0.00348)	(0.00298)	(0.00296)	(0.00301)	(0.00299)	(0.00301)
EARNINGS	0.04816***	0.03903***	0.03114**	0.03768***	0.04547***	0.03323***	0.06141***	0.03349***	0.03370***
	(0.00772)	(0.00749)	(0.01462)	(0.00759)	(0.00745)	(0.00747)	(0.00771)	(0.00756)	(0.00757)
GROWTH	0.00787***	0.00686***	0.00793***	0.00362***	0.00176**	0.00788***	0.00805***	0.00809***	0.00821***
	(0.00082)	(0.00086)	(0.00117)	(0.00089)	(0.00076)	(0.00082)	(0.00083)	(0.00083)	(0.00083)
NII	-0.00340***	-0.00360***	-0.00343***	-0.00346***	-0.00384***	-0.00342***	-0.00350***	-0.00343***	-0.00347***
	(0.00070)	(0.00074)	(0.00070)	(0.00090)	(0.00078)	(0.00070)	(0.00071)	(0.00071)	(0.00071)
DUM_LOSS	0.00083***	0.00109***	0.00195***	0.00079***	0.00077***	0.00107***	0.00112***	0.00110***	0.00111***
	(0.00012)	(0.00012)	(0.00023)	(0.00012)	(0.00011)	(0.00011)	(0.00012)	(0.00012)	(0.00012)
Constant	0.04910***	0.02555***	0.04239***	0.04602***	0.00234**	0.04770***	0.04901***	0.04856***	0.04883***
	(0.00094)	(0.00096)	(0.00095)	(0.00113)	(0.00107)	(0.00097)	(0.00094)	(0.00095)	(0.00095)
Obs	79,492	58,934	20,495	74,554	79,655	79,492	79,404	79,492	79,492
Adj R²	0.82694	0.83771	0.83075	0.79845	0.06289	0.82711	0.82578	0.82574	0.82542
FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports regression estimates of the relation between DC and DIV. All financial variables are winsorized at the 1% and 99% levels. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered at the bank level. Numbers in parentheses are *t*-statistics.

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To assess the robustness of my main findings, I re-perform my baseline model with alternative measures of my main variables of interests. In Model 4, following Levine et al. (2020), I compose the total cost of funds which is the total interest expense during a quarter over the interest-bearing liabilities. This overall cost of bank debts reflects the implicit interest rate on bank liabilities and is different across bank and time due to the heterogeneity of interest rates and debt maturity (Tran, 2020).[1] In Model 5, I consider my funding cost measure which is adjusted for bank-level characteristics (RDC). RDC is the residual terms obtained from regressing DC on bank size, bank earnings. In an unreported test, following Acharya and Mora (2015), I also compose the cost of core deposits since that is the most stable source of bank findings. In all specifications, I obtain qualitatively similar results.

In Models 6 and 7, I use alternative measures of bank dividend policy. First, to ensure that my finding reflects the commitment characteristics of dividend policy, I consider only on the subsample of banks that pay dividend for at least 12 quarters (LTPAYER). I also measure the persistent of dividend policy over 4, 8 and 20 quarters in unreported tests. Interestingly, I observe that the longer banks pay dividend, the lower cost of deposits is. Second, instead of using the dummy variable, I use the dividend ratio which is the dividends over the total assets. I used total assets to scale dividends following Abreu and Gulamhussen (2013), Ashraf et al. (2016) to ensure that my findings are not driven by the volatility of the bank performance when scaling over net incomes, and bank stock price when using dividend per shares. My findings remain unchanged.

Even repurchases are not viewed as an ongoing commitment like dividend, and are less effective as signals, there is a growing trend of stock repurchases over least decades (Floyd et al., 2015), I create REPUR which equals to 1 if the bank i repurchases at quarter t and 0 otherwise. In an unreported test, following Tran and Ashraf (2018), I also create REPUR_NO_DIVIDEND which equals to one if the bank i only does repurchase but does not pay dividends, and 0 otherwise, to mitigate the concerns of dividend effects on bank funding costs. The results in Model 8 show that banks that repurchase shares pay lower deposits costs than other banks, consistent with previous findings. I observe that the coefficient on REPUR is smaller than in Model 1, confirming the argument that repurchases are not considered as an ongoing commitment like dividend.

In brief, the results reported in Table 3 suggest through paying dividend, banks send a costly signal to outsiders about their confidence on financial health, which mitigates the information asymmetry between better informed insiders and outsiders, consequently, reduces the bank funding costs. It means that depositors

require lower deposit rates when banks commit to signal more private information to outsiders. The evidence suggests the existence of the depositor discipline.

Quantile Regressions

The above findings indicate bank dividend policy induce to an "average" lower deposit cost. However, by hiding discriminative outcomes of bank dividend policy, the traditional approach used in the above section represents only an incomplete figure about the effects of bank dividend policy on funding costs. I then rely on quantile regressions by estimating the effects of dividend policy on bank funding costs at different quantiles in the distribution. The results are shown in Table 4.

Table 4
Quantile regression

Variables	Q10	Q25	Q50	Q75	Q90
	(1)	(2)	(3)	(4)	(5)
DIV	−0.00049***	−0.00079***	−0.00101***	−0.00128***	−0.00147***
	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00006)
SIZE	−0.00036***	−0.00041***	−0.00040***	−0.00047***	−0.00041***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00003)
CAPITAL	−0.01004***	−0.01230***	−0.01451***	−0.01466***	−0.01213***
	(0.00039)	(0.00043)	(0.00051)	(0.00067)	(0.00104)
EARNINGS	0.01416***	0.02753***	0.03589***	0.05315***	0.07698***
	(0.00336)	(0.00334)	(0.00353)	(0.00437)	(0.00684)
GROWTH	0.00149***	0.00404***	0.00642***	0.00900***	0.01111***
	(0.00047)	(0.00039)	(0.00042)	(0.00049)	(0.00073)
NII	−0.00333***	−0.00382***	−0.00417***	−0.00402***	−0.00289***
	(0.00008)	(0.00008)	(0.00011)	(0.00014)	(0.00026)
DUM_LOSS	0.00034***	0.00035***	0.00046***	0.00080***	0.00117***
	(0.00007)	(0.00006)	(0.00006)	(0.00008)	(0.00012)
Constant	0.03886***	0.04461***	0.04885***	0.05393***	0.05579***
	(0.00041)	(0.00026)	(0.00026)	(0.00024)	(0.00040)
Obs	79,492	79,492	79,492	79,492	79,492

Notes: This table reports regression estimates of the relation between DC and DIV using quan-tile regression. All financial variables are winsorised at the 1% and 99% levels. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. Numbers in parentheses are *t*-statistics.

I observe that DIV has only a moderate effect with the estimated coefficient being close to zero for banks at the 10th quantiles. The coefficients on DIV however increase in magnitude (i.e., more negative) with the increase of the quantile. Overall, the results suggest a uniform pattern (negative) for the impacts of DIV on DC. This negative effect of DIV on DC tends to increase for high-DC banks (i.e., banks that pay higher deposit costs). Put it differently, Table 4 provides consistent evidence for the conjecture that funding situations of banks, reflected by the deposit costs, can be enhanced by paying dividend. This effect is more pronounced for higher-funding costs banks, i.e., banks that are facing serious information asymmetry with outsiders.

Endogeneity Concerns

One may have concerns on the endogeneity problems since my findings can be biased due to the simultaneous impacts of the unobservable bank factors on DIV and DC. I then use alternative econometric approaches such as the Heckman two-step model and the propensity score matching (PSM) approach. The results are tabulated in Table 5.

I first report the results from the Heckman selection model. In Model 1, I measure the propensity to pay dividend by using a logit model with all control variables. I also add in this model the fraction of dividend-paying banks in each quarter as the instrument variable. I obtain the inverse Mills ratio (IMR) from this model and include it into the second stage of the Heckman selection model. In Model 2, the results show a negative and statistically significant coefficient of DIV, consistent with previous findings. The coefficient on IMR is negative, suggesting factors that induce banks to pay dividends are negatively associated with the deposit's costs. Put it differently, the bank characteristics that induce banks to pay dividend, lead dividend-paying banks to pay lower deposit costs.

I complete the investigation of endogeneity concerns by relying on the propensity score matching (PSM). I use the same logit model to measure the propensity to pay dividends, then I match each dividend-paying bank with exactly one non-dividend-paying bank (PSM without replacement) in Model 3. In Model 4, I use one-to-one matching with replacement, which allows each non-dividend paying bank to be matched more than once. I match each dividend-paying bank with two non-dividend-paying banks (N = 2) (Model 5), with three non-dividend-paying banks (N = 3) (Model 6). In all specifications, my results remain unchanged.

Table 5
Endogeneity concerns

	Heckman selection model			Propensity-score matching		
Variables	First-step	Second-step	N = 1 w/o replacement	N = 1	N = 2	N = 3
	(1)	(2)	(3)	(4)	(5)	(6)
DIV		−0.00048*** (0.00009)	−0.00125*** (0.00014)	−0.00099*** (0.00015)	−0.00109*** (0.00014)	−0.00107*** (0.00014)
SIZE	0.15125*** (0.02354)	−0.00048*** (0.00007)	−0.00053*** (0.00008)	−0.00051*** (0.00009)	−0.00052*** (0.00009)	−0.00054*** (0.00009)
CAPITAL	1.63549** (0.68888)	−0.01620*** (0.00296)	−0.01616*** (0.00300)	−0.01847*** (0.00296)	−0.01851*** (0.00282)	−0.01776*** (0.00285)
EARNINGS	−2.62514** (1.29624)	0.04008*** (0.00775)	0.04724*** (0.00799)	0.03599*** (0.00955)	0.03775*** (0.00791)	0.03574*** (0.00733)
GROWTH	−0.87910*** (0.19982)	0.00812*** (0.00081)	0.00822*** (0.00094)	0.00721*** (0.00117)	0.00781*** (0.00110)	0.00777*** (0.00104)
NII	0.39661** (0.16843)	−0.00343*** (0.00069)	−0.00360*** (0.00072)	−0.00407*** (0.00079)	−0.00396*** (0.00075)	−0.00400*** (0.00074)
DUM_LOSS	−0.32930*** (0.02448)	0.00100*** (0.00012)	0.00084*** (0.00013)	0.00068*** (0.00017)	0.00077*** (0.00015)	0.00084*** (0.00013)
Fraction payers	2.46078*** (0.12751)					
Lambda		−0.00069*** (0.00007)				
Constant	−3.32139*** (0.30941)	0.04904*** (0.00093)	0.05048*** (0.00110)	0.05042*** (0.00120)	0.05047*** (0.00115)	0.05067*** (0.00114)
Obs	79,668	79,492	47,720	15,200	23,981	30,673
Adj R^2	0.10190	0.82838	0.82374	0.82629	0.82531	0.82500

Notes: The table reports regression estimates of the Heckman selection model, and the propensity scores matching. All financial variables are winsorised at the 1% and 99% levels. ***, **, * indicate significance at the 1%, 5%, and 10%, level respectively. Standard errors are clustered at the bank level. Numbers in parentheses are *t*-statistics.

ADDITIONAL ANALYSES

The Regulatory Pressure

My previous findings suggest the bright side of bank dividend policy since depositors require lower deposit rates when banks commit to signal more private information to outsiders through paying dividend. Since financial sector is highly regulated sector, both deposit funding costs and bank dividend policy are highly regulated. In this section, I focus on the effects of the regulatory hypothesis.[2] One may argue that the regulatory pressure analysis is better for a cross-country study

since regulators can be more stringent in some countries, but less stringent in other countries, whereas in single country context, country-level regulatory pressure is irrelevant because all banks face similar country-level capital requirements (Ashraf et al., 2016). I then follow Abreu and Gulamhussen (2013) to measure the degree of regulatory pressure based on the regulated capital ratios, since banks with critical level of risk-weighted capital ratio are more likely to be closely monitored by the supervisors. I create a dummy variable, PCA, which is equal to one if either the tier 1 risk-weighted capital ratio falls below 8% or the tier 1 leverage ratio falls below 7%, and zero otherwise. I consider PCA banks encounter higher pressure and closer monitor from regulators. I add this regulatory pressure variable, PCA, and its interaction term DIV*PCA into my baseline model. My variable of interest is then the interaction term, DIV*PCA.

The results were reported in Model 1, Table 6. The coefficient on DIV remains negative, suggesting banks that pay dividends enjoy lower deposit funding costs than non-payers. The coefficient on DIV*PCA is negative and statistically significant, the deposit costs of banks under high regulatory pressures that decide to pay dividend are lower than other banks.

One may have concern that I go further by examining the effects of bank performance. I interact the loss indicator (DUM_LOSS) with my variable of interest, DIV*PCA. The results reported in Model 2 document that the coefficient on DIV*PCA*DUM_LOSS is positive and statistically at the 1% level, suggesting that depositors consider the decision to pay dividend of banks under high regulatory pressure that encounter losses as a mean to shift the relative value of claims among bank's stakeholders, then consequently require higher deposit rates.

Table 6
Regulatory pressure

Variables	(1)	(2)
DIV	−0.00099***	−0.00110***
	(0.00013)	(0.00014)
DIV*PCA	−0.00068***	−0.00079**
	(0.00026)	(0.00031)
DIV*PCA*DUM_LOSS		0.00160***
		(0.00055)
DIV*DUM_LOSS		0.00111***
		(0.00021)
PCA*DUM_LOSS		0.00020
		(0.00021)

(*Continue on next page*)

Table 6 (*Continued*)

Variables	(1)	(2)
PCA	0.00104***	0.00097***
	(0.00022)	(0.00026)
SIZE	−0.00047***	−0.00047***
	(0.00007)	(0.00007)
CAPITAL	−0.01288***	−0.01276***
	(0.00316)	(0.00316)
EARNINGS	0.04533***	0.04244***
	(0.00759)	(0.00764)
GROWTH	0.00800***	0.00804***
	(0.00082)	(0.00082)
NII	−0.00347***	−0.00344***
	(0.00070)	(0.00069)
DUM_LOSS	0.00076***	0.00043***
	(0.00012)	(0.00013)
Constant	0.04882***	0.04887***
	(0.00094)	(0.00094)
Obs	79,492	79,492
Adj R²	0.82736	0.82766
FE	Yes	Yes

The Crisis and The Deposit Insurance Scheme

In this section, I investigate whether the depositor responsiveness changes under difference circumstances: (i) the deposit insurance scheme, and (ii) the crisis.

First, I focus on the deposit insurance scheme (DIS) which is designed to protect depositors and prevent the systemic risks. This safety net however comes at a cost of bank moral hazard since insured depositors enjoy de-jure protection. Due to their fixed outputs, insured depositors are indifferent to risk and lose incentives to monitor banks. DIS creates a class of bank stakeholders with decreased incentives to monitor. It is worth noting that insured depositors may be ineffective monitors, frequently lacking the competence to make informed valuation and risk assessments. More importantly, deposit insurance means that banks are able to raise funds from investors who may not have strong incentives to monitor, thus undermining other potential sources of discipline (risk-sensitive uninsured creditors). That suggests uninsured depositors be more severe than insured depositors since they face a higher risk of losing their funds.

Hence, I assess how insured and uninsured depositors respond to bank dividend policy. I compose the cost of insured deposits (i.e., IN_DC) and uninsured deposits (i.e., UN_DC), and then reperform my baseline model. The results are reported in Table 7.

Table 7
Deposit insurance scheme and crisis

Variables	Y = DC			Y = IN_DC			Y = UN_DC		
	Full sample	GFC	CVD	Full sample	GFC	CVD	Full sample	GFC	CVD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DIV	-0.00111***	-0.00098***	-0.00112***	-0.00087**	-0.00079*	-0.00067*	-0.00025*	-0.00019	-0.00022
	(0.00013)	(0.00013)	(0.00013)	(0.00044)	(0.00047)	(0.00038)	(0.00015)	(0.00014)	(0.00015)
DIV*X		-0.00153***	0.00018		-0.00088	-0.01128**		-0.00065*	-0.00145***
		(0.00026)	(0.00030)		(0.00059)	(0.00567)		(0.00038)	(0.00054)
X		-0.01985***	-0.03516***		-0.01654***	-0.01059*		-0.02198***	-0.03806***
		(0.00024)	(0.00039)		(0.00059)	(0.00563)		(0.00037)	(0.00070)
SIZE	-0.00045***	-0.00046***	-0.00045***	0.00046*	0.00046*	0.00046*	-0.00031***	-0.00031***	-0.00031***
	(0.00007)	(0.00007)	(0.00007)	(0.00028)	(0.00028)	(0.00028)	(0.00009)	(0.00009)	(0.00009)
CAPITAL	-0.01612***	-0.01610***	-0.01612***	-0.00613	-0.00612	-0.00597	-0.00801**	-0.00801**	-0.00800**
	(0.00297)	(0.00297)	(0.00297)	(0.00996)	(0.00996)	(0.00994)	(0.00322)	(0.00322)	(0.00322)
EARNINGS	0.04816***	0.04799***	0.04815***	0.10393***	0.10383***	0.10500***	0.01436	0.01428	0.01450*
	(0.00772)	(0.00772)	(0.00772)	(0.03778)	(0.03780)	(0.03781)	(0.00874)	(0.00874)	(0.00874)
GROWTH	0.00787***	0.00790***	0.00787***	-0.00513*	-0.00511*	-0.00507*	-0.00270***	-0.00268***	-0.00269***
	(0.00082)	(0.00082)	(0.00082)	(0.00267)	(0.00267)	(0.00266)	(0.00089)	(0.00090)	(0.00089)
NII	-0.00340***	-0.00336***	-0.00340***	-0.00593*	-0.00590*	-0.00599*	-0.00077	-0.00075	-0.00078
	(0.00070)	(0.00070)	(0.00070)	(0.00306)	(0.00306)	(0.00306)	(0.00088)	(0.00088)	(0.00088)
DUM_LOSS	0.00083***	0.00080***	0.00082***	0.00129***	0.00128***	0.00132***	0.00047***	0.00046***	0.00048***
	(0.00012)	(0.00012)	(0.00012)	(0.00045)	(0.00045)	(0.00045)	(0.00014)	(0.00014)	(0.00014)
Constant	0.04910***	0.04904***	0.04910***	0.03765***	0.03762***	0.03752***	0.05574***	0.05571***	0.05572***
	(0.00094)	(0.00094)	(0.00094)	(0.00360)	(0.00360)	(0.00359)	(0.00121)	(0.00121)	(0.00121)
Obs	79,492	79,492	79,492	79,074	79,074	79,074	78,916	78,916	78,916
Adj R²	0.82694	0.82723	0.82694	0.31091	0.31094	0.31172	0.76401	0.76405	0.76405
FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table reports regression estimates of the relation between DC and DIV. All financial variables are winsorised at the 1% and 99% levels. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered at the bank level. Numbers in parentheses are *t*-statistics.

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The results are shown in Model 4 with IN_DC as dependent variable and Model 7 with UN_DC. I also recall the result of my baseline model with the deposit costs (DC) as dependent variable in Model 1 to have easier comparison. The results in both models (Models 4 and 7) suggest that banks that pay dividend enjoy lower insured and uninsured deposit costs since the coefficients on DIV are both negative and statistically significant. Interestingly, I observe the coefficient on DIV is greater for insured deposit costs (IN_DC) (Model 4) than for uninsured deposit costs (UN_DC) (Model 7). On average, insured depositors seem to appreciate the decision to pay dividend more than uninsured depositors, suggesting the evidence of depositor discipline regarding the deposit insurance scheme.

During the crisis, there are higher odds of bank failures, depositors consequently become more aware about the risk of losing all their funds, then tend to monitor banks closer. However, government are more likely to intervene due to the potential costs of a systemic crisis, causing the moral hazard problems, and decreasing the market discipline especially for insured depositors. The period of study covers two different crises: (i) the global financial crisis (GFC) from 2007:Q3–2009:Q2, and (ii) the ongoing economic crisis triggered by the COVID-19 pandemic (CVD) since 2020:Q1. I create two crisis indicators (GFC and CVD), respectively. I add their interaction terms with DIV (DIV*GFC, DIV*CVD) to the baseline model, and re-run the baseline model. The results are shown in Models 2 and 3 for full sample analysis, Models 5 and 6 for insured deposits, and Models 8 and 9 for uninsured deposits.

Regarding the global financial crisis, I observe that the coefficients on DIV*GFC are both negative for insured and uninsured deposit costs, but only statistically significant for uninsured deposit costs. That is, uninsured depositors positively value the fact that banks pay dividends during the global financial crisis – which can be interpreted as a signal about the confidence of their financial health. The insured depositors however seem to be indifferent regarding the bank dividend policy during the global financial crisis, which may be explained by the expectation of the government interventions.

More than a decade after the global financial crisis, our world is now facing to one of the most devasting pandemic in the history that abruptly and severely constrict the global economic activity (Ding et al., 2021). I observe that the coefficient on DIV*CVD are both negative and statistically significant for insured deposit costs (Model 6) and at a larger extent for uninsured deposit costs (Model 9). The evidence of insured depositor discipline during the COVID-19 pandemic demonstrates the wake-up calls for insured depositors after the traumatic experiences from the global financial crisis.

To summarise, the findings from Table 6 suggest that there is evidence of the market discipline from both type of depositors, i.ee insured and uninsured depositors across sample periods. During the global financial crisis when their funds are at risk, I document the evidence of the market discipline for uninsured depositors, but insured depositors. The traumatic episodes experienced from the global financial crisis may act as wake-up calls for insured depositors, then increasing their awareness of the risk of their deposits during the COVID-19 pandemic where I observe both insured and uninsured depositors' value positively banks that does pay dividends.

CONCLUSIONS

In this study, I provide one of the first investigations on the responsiveness of depositors to bank dividend policy. I observe that dividend-paying banks pay lower deposit costs than non- payers. The effects of dividend policy on deposits costs is heterogeneous across the distribution of deposit costs. Dividend-paying banks that are subject to higher funding costs (i.e., facing severe information asymmetry between insiders and outsiders) may enjoy a greater decrease of funding costs than non-dividend paying banks. The study also highlights the downside of deposit insurance scheme when documenting the indifference of insured but uninsured depositors during the global financial crisis, since both insured and uninsured depositors' value differently the banks that does and does not pay dividends. The traumatic episodes experienced from the global financial crisis may act as wake-up calls for insured depositors, then increasing their awareness of the risk of their deposits during the COVID-19 pandemic. My findings are of interest of policy makers, regulators in this reforming time where there are initiatives to restrict banks' equity payout. My results highlight the decision to pay dividend is an important tool for depositors to better choose right banks to deposit their funds, especially during the turmoil times.

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NOTES

1. Rather dividing to the interest-bearing liabilities, I divide the total interest expenses to the gross total assets and find similar findings.
2. Thanks to an anonymous referee for suggesting this point.

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