INTERNATIONAL MONETARY FUND

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WP/22/194

WORKING PAPER

2022
SEP

 WP/22/194

IMF Working Paper
European Department

Why European Banks Adjust their Dividend Payouts?

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September 2022

ABSTRACT: Using a panel data approach for two samples of listed and unlisted European banks, this paper provides evidence that, over a decade and a half preceding the pandemic, bank dividend payouts were adjusted in line with the motivations found in the literature. Banks change their dividend payouts because they would like to signal good profitability to shareholders to address information asymmetry, or use dividends to mitigate the agency costs, or could come under pressure from prudential supervisors and regulators to retain earnings. Banks are found not to discount expectations about future economic conditions or their own profitability when making payouts. Simulations show that, in the absence of supervisory sector-wide recommendations to suspend dividend payouts, banks would likely have reduced the payouts only slightly in the first year of the pandemic.

JEL Classification Numbers:	G21, G35
Keywords:	Bank dividend policy, banking regulation and supervision, panel data analysis.
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[1] The authors would like to thank, without implicating, Desislava Andreeva, Sophia Chen, Rupa Duttagupta, John Fell, Paul Hiebert, Csaba More, Dionysios Mylonas, and participants of the ECB seminar for useful comments, discussions, and suggestions. Any errors remain our own. The paper was written when Marco Belloni and Mariusz Jarmuzek worked at the European Central Bank. An earlier, abridged version of this paper was published in the ECB Macroprudential Bulletin No. 13 (June 2021). Daniel Murphy Pineda provided excellent assistance. The views expressed in this paper are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management. Equally, the views expressed in this paper are those of the authors and do not necessarily represent the views of the ECB, its Executive Board, or Eurosystem.

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1. Introduction

At the outset of the COVID-19 pandemic, prudential authorities took a high interest in bank dividend policies in view of the expected deterioration of bank asset quality, which was considered a threat to stability of the banking sector. Banks face a choice between paying out dividends to remunerate shareholders, and retaining earnings to absorb potential future losses or provide regulatory capital necessary to support lending. Shareholders and bank managers may have an incentive to pay out dividends, in particular where alternative investment opportunities available in the financial market offer a prospect of higher returns than those provided by bank equities. In a downturn, this might, if unchecked by regulators, weaken bank balance sheets and leave them less well equipped to handle losses. Unlike in the global financial crisis, in the COVID-19 pandemic European regulators recommended that all banks should not make distributions in order to prevent an outflow of regulatory capital from the banking sector before the materialisation of crisis-induced losses.

This paper investigates the drivers of bank dividend policies in the euro area and attempts to shed light on a possible counterfactual reaction of banks to the COVID-19 pandemic. Some economic commentators suggested that the dividend restrictions have depressed bank stock valuations, and that banks could have been allowed to maintain distributions in order to facilitate their access to capital markets. These commentators argued that banks would act prudently and take their dividend payout decision looking forward to the potential losses. This would lead to lower dividend payouts without a need for supervisory intervention. As the restrictions have been addressed to the entire banking sector, and an overwhelming majority of banks complied, there is no natural control group that would allow for testing such claims. This paper therefore aims to identify the economic and financial drivers of bank dividend payouts, and to investigate whether banks in the past have taken into account the expected future economic conditions when making decisions on payouts. On this basis, the paper carries out a counterfactual analysis to reveal how large euro area banks would have responded to the pandemic, should there have been no restrictions on dividend payouts. Its contribution is that it analyses the impact of economic prospects and uncertainty on dividend policies and focuses on two samples of European banks.

Our analysis identifies the economic and financial drivers of bank dividend payouts and suggests an important role played by supervisors during the most uncertain phase of the pandemic. European banks are found to have paid out a larger share of their profits as dividends when they have been more profitable and better-capitalised. Higher dividend payouts are also associated with larger banks and with superior shareholder protections, both in line with the agency cost hypothesis. However, banks do not seem to systematically account for future expected economic developments, economic uncertainty or for their own earnings' prospects when making decisions about dividend payouts. Counterfactual simulations carried out with the models embedding key drivers suggest that some reduction in dividends paid out could have been expected in 2020, but it would have likely been limited in size. This implies that the supervisory recommendations have played an important role in retaining capital in the banking sector during the most uncertain phase of the pandemic, thus increasing its loss absorption capacity.

The remainder of the paper is organised as follows. Section 2 reviews the main findings from the economic literature covering dividend payout decisions by banks. Section 3 outlines the key elements of the regulatory framework governing banks' dividend payouts, and summarises the

various restrictions introduced by the euro area regulators in 2020. Section 4 describes the data and the empirical methodology, and Section 5 discusses the results and the counterfactual simulations. The final section collects the key conclusions from the paper.

2. Related Literature

The Miller-Modigliani dividend irrelevance framework has served as a benchmark for research on dividend policy. Leveraging on the findings of Lintner (1956) who analysed corporate dividend payout policy based on a survey of managers, the theoretical model developed by Miller and Modigliani (1961) demonstrates that firm dividend policy has no impact on its value, under the assumptions of perfect and complete capital markets and a neutral tax system. Once these assumptions are relaxed, dividend policy has a bearing on the value of firms. The literature departing from the dividend irrelevance concept sheds light on factors shaping dividends of non-financial and financial corporates (Allen and Michely, 2003).

The asymmetric information strand hinges on the idea that insiders have better information than outsiders. According to the signalling theory, managers may know more about the true value of their firm compared to investors, so that dividends can be used to extract signals about future cash flows. The model developed by Bhattacharya (1979), which was subsequently extended by Miller and Rock (1985) and John and Williams (1985), shows that dividend announcements convey information about current and future earnings, with larger than expected earnings implying higher dividends. Deshmukh (2003) suggests that the pecking order models developed by Myers and Majluf (1984) imply that growing firms retain profits to ensure that their investment plans are funded. This so-called growth opportunities phenomenon results in lower dividends. Banks are in many ways different from non-financial firms. One of them is that the large proportion of bank creditors is insured by public guarantee schemes, making monitoring banks' policies less important for these creditors (Wardhana, 2016). The other one is that banks tend to be more opaque than other non-financial firms, so have higher information asymmetry (Morgan 2002; Caprio et al. 2007).

The empirical studies provide support for the asymmetric information strand. Building on the signalling theory, Benartzi et al (1997) show that non-financial firms with higher current earnings tend to pay higher dividends. Evidence from Boldin and Leggett (1995) for US banks and Forti and Schiozer (2015) for Brazilian banks confirms the relevance of current earnings for explaining dividend payouts.[1] Recently, Gambacorta et al (2020) note that banks with a low price-to-book ratio (significantly below one) pay higher dividends as their investors may anticipate a deterioration in future earnings and prefer receiving cash dividends to holding the stock. They argue that bank managers would have a strong incentive to meet such preferences as lower equity base would help them meet the return targets expected by the investors.

The incomplete contract strand suggests that if contracts are unenforceable, there might be some agency costs associated with a conflict between stockholders, management, and bondholders over dividend policy. Jensen and Meckling (1976) show that large corporates tend to pay high dividends to mitigate the agency cost problem. The argument hinges on that managers in larger corporates

[1] Some authors also note that dividends are sticky to the downside, as managers are often reluctant to cut dividends, which may be perceived by investors as management failure (Brav et al, 2005).

tend to have greater decision-making power compared to shareholders, with the latter having access to minimal public information and a limited ability to monitor corporate behaviour, resulting in high agency costs. Separately, but building on the model by Jensen and Meckling (1976) and its refinements, La Porta et al (2000) demonstrate that corporates in countries with superior investor protection generate higher dividend payouts compared to corporates in countries with lower investor protection, with an effective legal system providing investors with the opportunity to reduce agency costs by forcing managers to pay out dividends. Dickens et al (2002) and John et al (2010) provide support for the agency cost hypothesis for US banks.

The regulatory strand suggests that banks are constrained by regulators in their dividend payouts policy. Baker et al (2008) and Gropp and Heider (2010) demonstrate that financial corporates have different capital structures compared to non-financial corporates, given that the former typically have deposits as a dominant source of financing, which are generally not available to the latter. The importance of deposit-taking role along with the criticality of banks in terms of financial intermediation makes them subject to regulation. Regulatory influence limits dividend payouts by banks with lower capital standards (see section 3 for details of the applicable framework), implying that banks with higher capitalization pay higher dividends. Theis and Dutta (2009) provide support for the regulatory hypothesis for US banks.

Beyond asymmetric information, agency, and regulatory strands, other factors may also have some bearing on dividend policy of banks. Kanas (2013) investigates the relevance of riskiness of the loan portfolio for dividend payout policy of US banks, hypothesizing a negative relationship between credit risk and dividend payouts. In their seminal contributions, Lintner (1956) and Fama and Babiak (1968) analyse if past dividend payouts reflect the preference of corporates to opt for a stable dividend policy, which has been extended to US banks by Dickens et al (2002) and Theis and Dutta (2009). Casey and Dickens (2000) examine the role of taxes for US banks' dividend payouts and find that an increase in income tax rates on dividends relative to that applied to capital gains is associated with lower dividend payout ratios.

While the literature on bank dividend payout policy is abundant and growing further, there are important limitations, which this paper attempts to address. Earlier empirical studies employed data for US or global banks, with no explicit analysis of the European banking landscape, which has undergone significant changes following the Global Financial Crisis and European Sovereign Debt Crisis. Specifically, previous studies do not cover the aftermath of the crises, with the exception of Gambacorta et al (2020). However, that study focuses on global banks, not examining explicitly if there was any structural break associated with the crises. In contrast, this paper focuses on two samples of European banks, covering either listed banks, which tend to be larger and more complex, or all banks including those which are not listed – of which the vast majority is relatively small, simpler, and domestically-oriented. This gives the conclusions an additional degree of robustness and allows to identify divergence between underlying drivers of payouts by these two groups of banks. Furthermore, although Collins et al (1994) and Theis and Dutta (2009) analyze the impact of the price-to-book ratio on dividend payouts, which can to a certain extent capture future economic prospects, to our knowledge, no study has explicitly and systematically examined the impact of economic prospects and uncertainty on dividend payouts.

3. Regulatory Framework and Measures During the COVID-19 Pandemic

Banking regulation is relevant for bank dividend policies, as bank supervisors are often granted special powers with respect to restricting dividend payouts on the grounds of prudence. International standards, agreed by the Basel Committee for Banking Supervision, require that the banking supervisors should have an appropriate range of supervisory tools to act when a bank under their supervision is not complying with the laws, regulations, or supervisory actions, or engages in unsound business practices, or activities that could threaten the stability of the bank or the banking system. These tools include explicitly a possibility to impose restrictions on payout of dividend and share buybacks (BCBS, 2019, chapter RBC30). Supervisors should act early, ideally anticipating the risk of a bank breaching its minimum capital requirements.

The global financial crisis demonstrated that such discretionary restrictions were insufficient when a crisis would rapidly unfold. Many banks which subsequently failed continued paying dividends in spite of the clear signs of financial distress having already emerged. Among those, Lehman Brothers – whose failure in September 2008 prompted the acute phase of the crisis – paid its last dividend only a few weeks before filing for bankruptcy.

The post-crisis regulatory reforms are likely to have affected the probability that a bank would be constrained in its dividend policy by regulatory factors. Comparing to the pre-crisis times, the levels of capital at which regulation acts as a brake on payouts have become much higher. Bank-specific automatic restrictions were introduced after the global financial crisis together with a capital buffer framework that aims at strengthening the bank capital base and reducing the risk of bank failures. The macroprudential capital buffers consist of the capital conservation buffer, set to 2.5% of risk-weighted assets for all banks, countercyclical buffer applied to specific exposures, firm-specific buffers for global and other systemically important institutions, as well as, in some countries, systemic risk buffers. These buffers are a softer constraint to bank capital than the minimum capital requirements, and should be used when banks are facing financial distress to absorb losses and maintain lending. However, the use of macroprudential capital buffers comes with a range of constraints on banking activity. In particular, distribution of profits to shareholders, as well as payment of coupons on Additional Tier 1 (AT1) capital instruments, is automatically restricted once a bank would use a part of its capital buffers. This restriction is designed as a cap, also called the 'maximum distributable amount' (MDA). The MDA decreases in increments of 20 percentage points in lockstep with the amount of capital buffers which have been used, so that a bank which has completely exhausted its capital buffers would not be allowed to pay out any dividends or coupons on AT1 instruments (Svoronos and Vrbaski, 2020).

In practice, during the global Covid-19 pandemic, restrictions to dividend payouts materialised already before bank capital dropped below the MDA caps. Faced with the extreme uncertainty, the euro area regulators recommended banks to restrict dividend payouts more tightly than implied by the MDA rules in March 2020. The MDA rules would result in lower dividend payouts only after the materialisation of losses, and therefore would not have bound the distributions made from 2019 profits, which would still be subject to the MDA thresholds calculated on the basis of pre-crisis end-2019 capital ratios. In the Covid-19 crisis, some of the micro- and macroprudential capital requirements were reduced to facilitate lending, temporarily reducing the threshold beyond which the MDA rules would apply. At the same time, supervisors assessed that it is highly likely that the

banking sector would be faced with elevated credit losses, the recognition of which would be deferred by the extensive public support schemes to struggling borrowers as well as short-term regulatory forbearance. Therefore, with the aim of boosting banks' capacity to absorb losses and support lending, the ECB, acting in its capacity as the banking supervisor for the EU countries participating in the single supervisory mechanism, issued a recommendation on 27 March 2020 that banks should refrain from paying dividends and buying back shares at least until end-September 2020. The European Systemic Risk Board adopted a similar recommendation, targeting all financial firms in the entire European Union (ESRB, 2020).

As economic uncertainty slowly declined, regulators allowed banks to resume dividend payouts, although subject to tight restrictions on quantity of distributions. After extending its recommendation to banks in July 2020 until end-2020, in December 2020 the ECB acknowledged that the economic uncertainty had declined. Nevertheless, the full impact of the pandemic on bank balance sheets has not manifested itself yet, owing in part to successful policy support. On 15 December 2020, the ECB updated its recommendation, asking banks to exercise extreme prudence in their decisions concerning dividend payouts and share buybacks until 30 September 2021. The ECB expected banks not to distribute more than 15% of their cumulative 2019 and 2020 profits, and to limit payouts to less than 0.2% of the total risk-weighted assets (ECB, 2020). Similar actions were taken by other European supervisors, most notably in Denmark, Sweden and the UK.

In addition to supervisory actions, restrictions on dividend payouts are also likely to be imposed in cases where the company received state support. The European Union state aid framework for banks generally requires banks to refrain from paying dividends in order to prevent the outflow of capital to private shareholders and limit the cost of public intervention to the taxpayers. These restrictions should be introduced as soon as capital shortfall that would likely result in intervention of the state is identified (European Commission, 2013).

4. Empirical Investigation

4.1. Data

The analysis is based on annual bank-level data. We use two complementary unbalanced panels of euro area banks. The first panel covers a sample of 69 listed banks observed over 2005–2019, with the data collected from SNL Financial. The second panel covers about 1,400 banks, a large majority of which are unlisted, over a shorter period (2010–2019) and was collected from Orbis BankFocus. Drawing on Baker and De Ridder (2018), this study employs as a dependent variable a ratio of total dividend paid over total after-tax earnings. In order to limit the effect of outliers, and in particular to exclude banks which may be subject to non-disclosed supervisory restrictions on distributions,[2] banks with negative after-tax earnings and capital ratios are excluded.

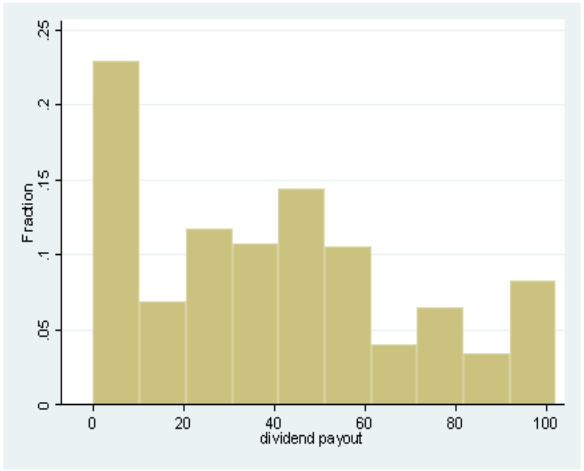
[2] As mentioned in the previous sections, supervisors have powers to prohibit dividend payouts by banks which are in breach of capital requirements. It follows that such distressed banks would not adjust their dividend policies in line with the economic factors as others, more healthy banks would do.

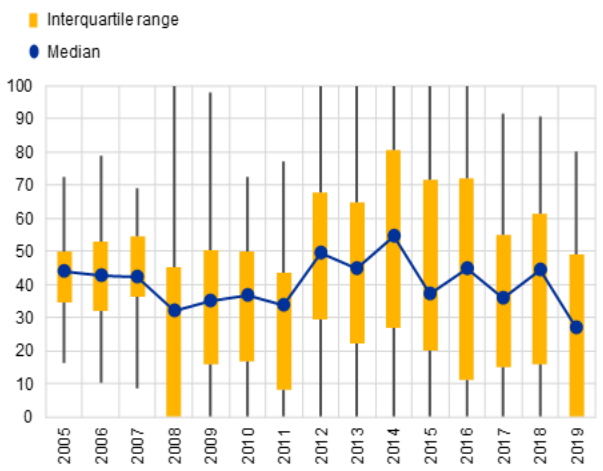
Explanatory variables are divided into groups reflecting the main hypotheses outlined in Section 2.[3] In line with the empirical research, the asymmetric information hypothesis is represented by profitability measured by return on assets (ROA) and return on equity (ROE), as well as by opacity and growth opportunities. Similarly, the agency hypothesis is approximated by the log of assets and market capitalisation, as well as by the index of shareholder's legal protection compiled by the World Bank. Higher values of the index indicate that the outsider minority shareholders have higher legal protection and the insiders are less likely to expropriate the outsiders' wealth in the banks. GDP growth that is meant to control explicitly for the business cycle is sourced from the ECB Statistical Data Warehouse. Data definitions and sources are described in Table A1.

4.2. Descriptive Analysis

Bank dividend payouts have varied in a seemingly procyclical –albeit heterogeneous– way over the business and financial cycle. The nature of the dividend payouts is such that it is truncated at zero, as a significant number of banks choose not to pay dividends (Chart 1), with the fraction of banks with no payouts fluctuating over time. Dividend payouts reached a high point immediately prior to the global financial crisis, and declined in its aftermath as regulatory requirements were tightened and banks' profitability fell. Yet, there has been a high cross-sectional variance at any point in time, indicating that bank-specific circumstances play a large role in determining payout policies (Chart 1).

Figure 1: Distribution of Dividend Payout Ratios in a Pooled Sample (left panel) and Over Time (right panel)



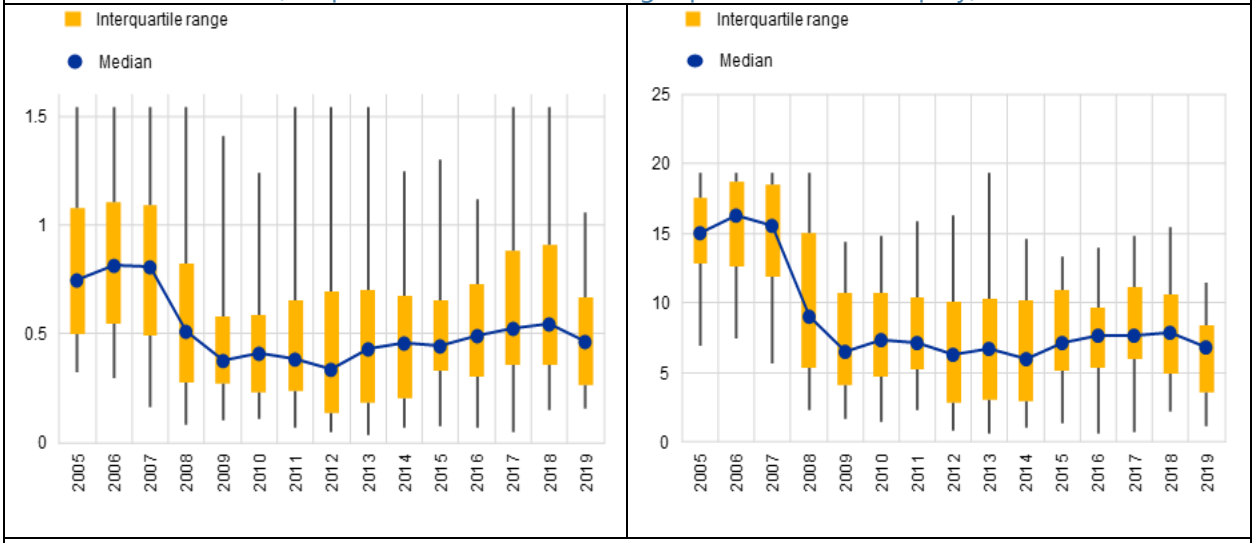


Source: SNL Financial, authors' calculations.
Note: the dividend payout ratio is represented in percentages on both panels.

[3] Other categorizations of explanatory variables are also used in the literature. For example, Fama and French (2001) and Abreau and Gulamhussen (2013) divide explanatory variables into asymmetric information hypothesis variables and agency cost hypothesis variables, and other control variables that include e.g. size and growth opportunities. This paper follows Bernatzi et al (1997) and Desmukh (2003) and considers earnings and growth opportunities as part of the asymmetric information hypothesis

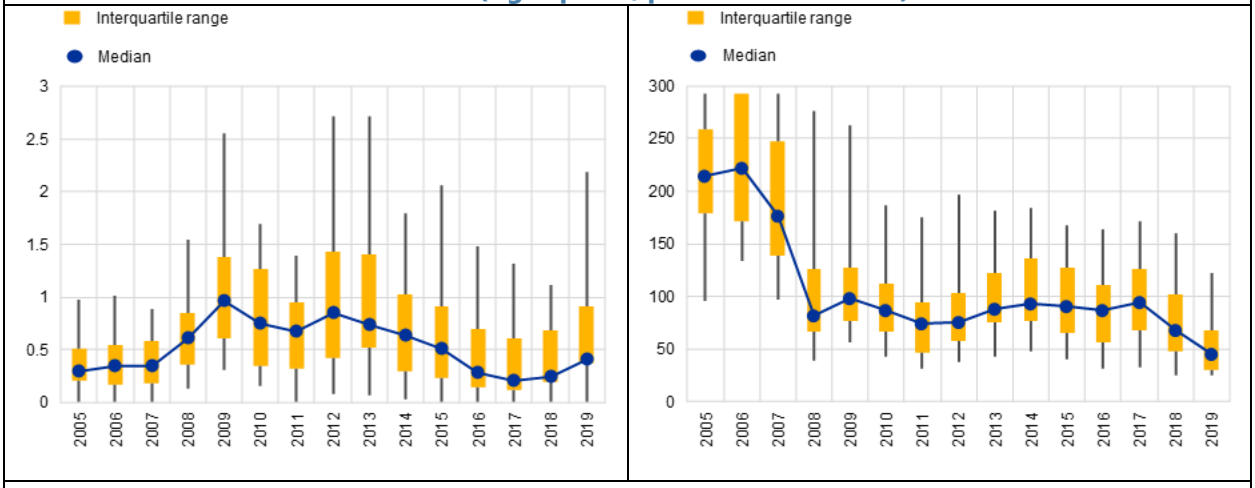
This descriptive analysis suggests that two offsetting factors may have influenced bank dividend payouts, and contributed to the high observed dispersion of payout ratios. On one hand, average bank profitability started off from a very high level prior to the global financial crisis, and declined abruptly to reach a trough around 2012, as the euro area economy was hit by the sovereign debt crisis (Chart 2). It has recovered only moderately, and trended sideways in the second half of the last decade, remaining much weaker than in the early part of the sample. Banks' earnings prospects, as measured by the price-to-book ratio for traded bank stocks, have been steadily revalued downwards over the sample period, and reached their lowest point by 2019 (Chart 3). This could indicate further downward pressure on dividend payouts. On the other hand, the banking sector became much better-capitalised, which could have supported its ability to make distributions (Chart 4). Regulatory capital ratios increased steadily between 2008 and 2013 as regulatory requirements were tightened. Cohen and Scatigna (2014) show that, while improved capital ratios were achieved mainly through de-risking and reductions in assets, retained earnings (including foregone dividends) contributed to an increase in total capital of a sample of 31 large European banks by about 8.3% over 2010–2012, as average payout ratios declined from 38% to 26%. The non-risk-weighted leverage ratios also increased, pointing to the build-up of equity capital, although by less than the regulatory risk-weighted ratios (Chart 4, right panel).Capital ratios further increased between 2015 and 2017, to stabilise at almost double the level observed prior to the global financial crisis. Credit risk, which was elevated in the wake of the global and then sovereign debt crisis, receded slowly in the second half of 2010s (Chart 3, left panel).

Figure 2: Distribution of Bank Profitability Ratios
(left panel: return on assets, right panel: return on equity)



Source: SNL Financial, authors' calculations.

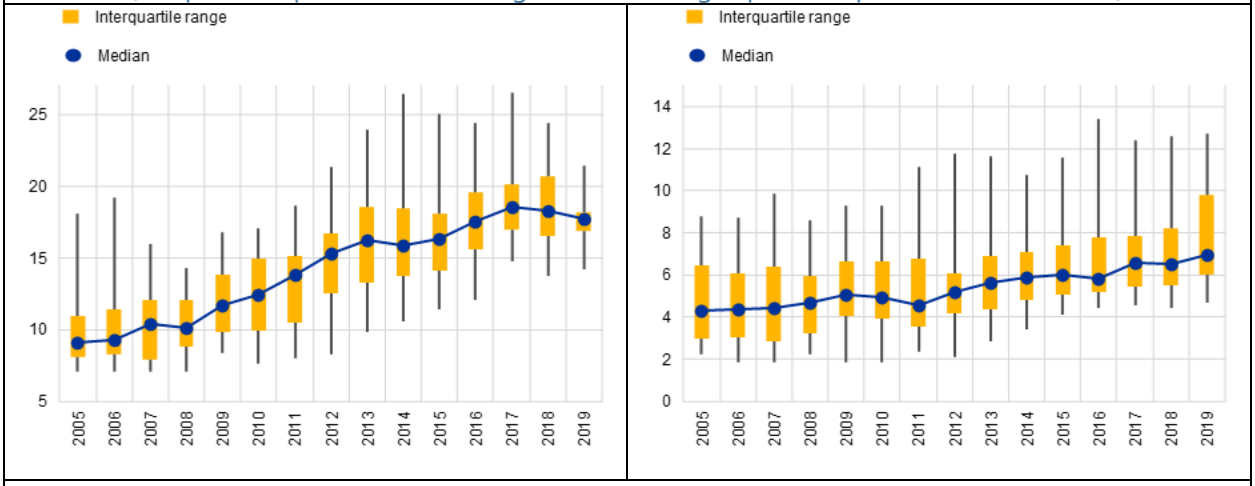
Figure 3: Distribution of Loan Loss Provisions (left panel, over total assets) and Bank Market Valuation (right panel, price-to-book ratio)



Source: SNL Financial, authors' calculations.

Figure 4: Distribution of Bank Capital Ratios

(left panel: capital over risk-weighted assets, right panel: capital over total assets)



Source: SNL Financial, authors' calculations.

4.3. Econometric Methodology

Leveraging on the existing literature encompassing the key variables explaining dividend payout, variants of the following equation are estimated in the baseline specifications:

$$DP_{it} = \alpha_0 + \alpha_1 DP_{it-1} + \sum_{k=1}^{l} \alpha_{2,k} AIHV_{k,it-1} + \sum_{k=1}^{m} \alpha_{3,k} AHV_{k,it-1} + \sum_{k=1}^{w} \alpha_{4,k} OV_{k,it-1} + \varepsilon_{it}$$

where DP denotes dividend payout in bank i at time t, which is explained by asymmetric information hypothesis variables (AIHV) and agency hypothesis variables (AHV), and other variables (OV).

A limited dependent variable model is applied, extended with some robustness checks. The model is initially estimated with the standard random effect estimator. Drawing on the literature applying panel data techniques to examine the role of institutions, we follow Plümper, Troeger, and Manow (2005, 2007) as well as Bell and Jones (2015) and employ this estimator, as it allows accounting for institutional features as well as the fact that governance indicators typically are very slow-moving (Jarmuzek and Lybek, 2020). Given however the characteristics of the dependent variable that is truncated at zero, the Tobit model has been subsequently employed (Amore and Murtinu, 2019; Wooldridge, 2002). This is in line with the methodology adopted for examining dividend payout by Kim and Maddala (1992) and Breuer et al (2014) for corporates and by Abreu and Gulamhussen (2013) and Forti and Schiazer (2015) for banks. In order to mitigate potential endogeneity associated with simultaneity, the explanatory variables are lagged by one year, following Buch et al (2013) and Gupta (2005). Within the baseline model specifications, the initial step involves testing the asymmetric information and agency cost hypotheses, which is followed by examining also such variables as credit risk and GDP growth.

Going beyond the baseline model, the specification is extended to account for forward-looking variables capturing altering economic prospects and degree of uncertainty.

$$DP_{it} = \alpha_0 + \alpha_1 DP_{it-1} + \sum_{k=1}^{l} \alpha_{2,k} AIHV_{k,it-1} + \sum_{k=1}^{m} \alpha_{3,k} AHV_{k,it-1} + \sum_{k=1}^{w} \alpha_{4,k} OV_{k,it-1} + \sum_{k=1}^{g} \alpha_{5,k} FLV_{k,it-1} + \varepsilon_{it}$$

where DP denotes dividend payout in bank *i* at time *t*, which is explained by asymmetric information hypothesis variables (AIHV) and agency hypothesis variables (AHV), other variables (OV), and forward-looking variables (FLV).

4.4 Baseline Results

The results support the three main hypotheses discussed in the available literature presented section 2 and align with the recent empirical studies conducted for US and global banks. Bank profitability is found to be positively associated with dividend payout, so that banks exhibiting higher levels of profit are found to mitigate uncertainties facing managers and pay more dividends, reinforcing the view that dividend announcements may convey information about current and future earnings. This is consistent with the asymmetric information hypothesis.

The agency hypothesis grounded in incomplete contract theory is also supported by the data. Larger banks tend to pay higher dividends to mitigate the agency cost problem. Furthermore, there is also evidence that banks in countries with superior investor protection generate higher dividend payouts compared to banks in countries with lower investor protection. Both findings confirm the predictions of the theoretical framework developed by Jensen and Meckling (1976) and subsequent empirical studies.

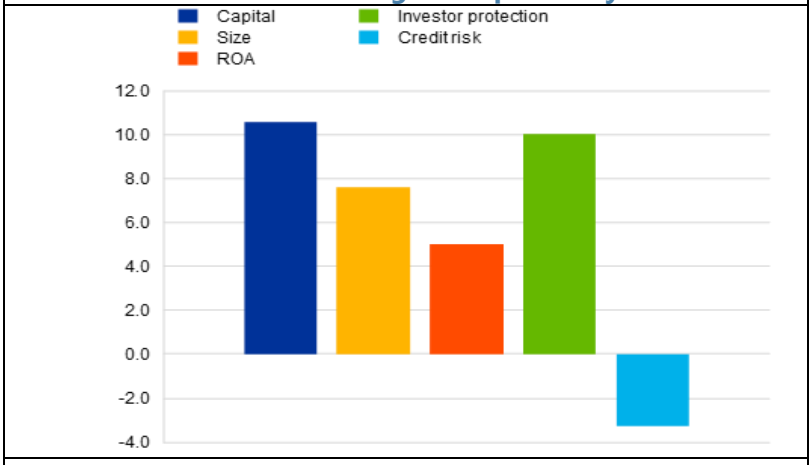
The analysis also supports the regulatory hypothesis. Our results indicate that European banks holding higher capital pay higher dividends. This is consistent with the expectation that banks with higher capitalization face lower regulatory pressure, permitting them to pay higher dividends, in line

with the regulatory framework outlined in section 3. In the context of the global financial crisis followed by regulatory reforms, our data support the view that more levered banks decided to retain a larger share of their earnings to rebuild their capital buffers.

Credit risk and dividend payout history also seem to have some influence on dividend policy of banks. Credit risk is found to be negatively associated with dividend payouts, confirming the findings of Kanas (2013) for US and of Forti and Schiozer (2015) for Brazilian banks. In line with the literature, past dividend payouts are estimated to be positively associated with future dividend payouts, reflecting the preference of banks to smooth out dividend policy.

The analysis of economic significance of factors underpinning dividend policy points to the leading role played by the regulatory and agency hypotheses. Drawing on Maudos and Fernandez de Guevara (2004) and Ashraf et al (2016), the analysis involves computing implicit elasticities for the explanatory variables evaluated at sample means, which allows estimating the impact of one standard deviation change in the explanatory variables on the dividend payouts (Chart 5). The results suggest the prominent role of the regulatory hypothesis in setting dividend policy, with an increase in capitalization by one standard deviation resulting in an increase in dividend payout ratio by about 11 percentage points. Put differently, the regulatory reforms which led to the observed increase in bank regulatory capital levels have, in the longer term, enabled banks to increase dividend payouts to shareholders in spite of the persistent challenges to bank profitability. The agency hypothesis has some bearing on dividend policy too, as the impact of size and investor protection variables is estimated to be around 8 and 10 percentage points, respectively. While profitability and credit risk variables are associated with dividend payouts, their effects are estimated to be less powerful than those of the other variables explored in this paper.

Figure 5: Response of Dividend Payout Ratio to One Standard Deviation Change in Explanatory Variables



Source: authors' calculations.
Note: estimated impact of one standard deviation change in the explanatory variables on the dividend payouts, holding all other variables at the sample mean. Figures in percentage points.

Table 1: Main Regression Results

	listed banks						*unlisted banks*					
Dep. variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
dividend payout ratio	RE	Tobit	RE	Tobit	RE	Tobit	RE	Tobit	RE	Tobit	RE	Tobit
Lagged dividend payout ratio	0.598***	0.603***	0.588***	0.675***	0.591***	0.659***	0.431***	0.215***	0.357***	0.256***	0.355***	0.256***
	(0.045)	(0.040)	(0.044)	(0.029)	(0.046)	(0.032)	(0.011)	(0.012)	(0.011)	(0.012)	(0.011)	(0.012)
Capital	1.036***	1.152	1.061***	0.938***	0.831***	0.668***	0.413***	0.384***	0.0998	0.164*	0.107	0.172**
	(0.354)	(0.291)	(0.359)	(0.259)	(0.341)	(0.264)	(0.067)	(0.068)	(0.096)	(0.102)	(0.096)	(0.102)
ROA	3.664	5.006**	3.414	5.158**	5.502*	7.466***	3.127***	2.684***	4.61***	3.135***	4.594***	3.119***
	(2.745)	(2.868)	(2.882)	(2.517)	(3.154)	(2.743)	(0.203)	(0.231)	(0.244)	(0.252)	(0.244)	(0.252)
Size	1.878***	2.326***	1.684***	1.963***	1.857***	2.137***	1.23***	0.702***	1.115***	0.538***	1.066***	0.513***
	(0.605)	(0.724)	(0.621)	(0.561)	(0.653)	(0.574)	(0.224)	(0.286)	(0.245)	(0.278)	(0.245)	(0.278)
Minority shareholder protection	2.721***	3.402***	2.958***	3.217***	2.229***	2.492***	5.862***	13.29***	5.751***	12.34***	5.384***	12.17***
	(0.676)	(0.817)	(0.691)	(0.633)	(0.769)	(0.677)	(0.622)	(0.862)	(0.684)	(0.841)	(0.694)	(0.846)
Credit risk			-1.528	-2.583*	-3.252**	-4.404***			-2.126***	-0.805***	-2.123***	-0.803***
			(1.725)	(1.611)	(1.622)	(1.747)			(0.157)	(0.124)	(0.157)	(0.124)
GDP growth					-0.292	-0.525					1.591***	0.711**
					(0.937)	(0.683)					(0.526)	(0.443)
Time effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R sq.	0.54		0.54		0.54		0.51		0.50		0.50	
N	444	444	439	439	383	383	5,855	5,855	5,722	5,722	5,722	5,722

Source: authors' calculations.

Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10%, while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects and Tobit for different specifications. Columns (1) to (6) show the results for listed banks, while columns (7) to (12) refer to unlisted banks. Regressions are computed for two sets of unbalanced panels over the period 2005–2019. The asymmetric information hypothesis is represented by return on assets (ROA); the agency hypothesis is approximated by the log of assets (size) and by the index of shareholder's legal protection; the regulatory hypothesis is represented by bank capitalization; GDP growth is meant to control explicitly for the business cycle; credit risk is meant to capture possible relationship between the riskiness of the loan portfolio and dividend payouts.

4.5 Role of MDA Regime

As discussed in section 3, regulatory reforms, in particular the implementation of the MDA threshold in 2014, can be considered a structural break. To account for this issue, a dummy variable is constructed, taking the value of 1 starting from 2014, which is interacted with the capital adequacy variable. The outcome of this analysis has no supporting evidence for the hypothesised structural break in the relationship between payouts and bank capital adequacy (Table 2). This suggests that the introduction of the formal MDA restrictions may not have led banks to assign a higher weight to capital levels when deciding on dividend payouts.

Table 2: Regulatory Regime Change Through Introduction of MDA

Dep variable: dividend payout ratio	(1) RE	(2) Tobit
Lagged dividend payout ratio	0.585***	0.653***
	(0.0450)	(0.0378)
Capital	0.513	0.307
	(0.573)	(0.419)
ROA	1.848***	2.133***
	(0.661)	(0.663)
Size	5.812*	7.787**
	(3.186)	(3.172)
Minority shareholder protection	2.175***	2.422***
	(0.777)	(0.782)
Credit risk	-2.779*	-3.867*
	(1.618)	(2.057)
GDP growth	-0.327	-0.554
	(0.962)	(0.784)
MDA	0.612	0.677
	(0.636)	(0.537)
Time effects	yes	yes
N	383	383

Source: authors' calculations.
Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10%%, while standard errors are reported in parenthesis. The table shows the results for a panel regression with random-effects and Tobit only for listed banks. The regressions are computed for an unbalanced panel over the period 2005–2019. The baseline regression in Table 1 has been extended to include the independent variable "MDA" (Maximum Distributable Amount) in order to capture regulatory regime changes (i.e. introduction of dividend restrictions) as explained in Section 3.

4.6 Role of Forward-Looking Variables

The next stage of the empirical investigation involves examining if banks set dividend payout policies taking into account altering economic prospects and degree of uncertainty. Drawing on Dickens et al (2002), Theis and Dutta (2009), and Onali (2014), the relevance of the price-to-book ratio intended to capture future returns is examined first. The results demonstrate that banks do not seem to systematically account for their own market valuation when setting dividend payouts (Table 3), although the sign associated with this variable is in line with expectations.

Table 3: Regression Results Accounting for Forward-Looking Variables

Dep. Variable: dividend payout ratio	(1)	(2)	(3)
Lagged dividend payout ratio	0.687***	0.695***	0.693***
	(0.0356)	(0.0373)	(0.0373)
Capital	0.849***	0.867***	0.865***
	(0.303)	(0.329)	(0.329)
ROA	5.587*		
	(3.298)		
ROAP		-3.261	-3.259
		(4.547)	(4.547)
Size	1.830***	0.449	0.448
	(0.652)	(0.696)	(0.696)
Minority shareholder protection	3.305***	2.441***	2.438***
	(0.751)	(0.837)	(0.837)
Credit risk	-2.676	-3.717*	-3.715*
	(1.874)	(2.120)	(2.120)
Price-to-Book	-0.0122		
	(0.0217)		
Economic consensus change index		0.115	
		(0.0714)	
Economic forecast uncertainty index			5.577
			(3.476)
Time effects	yes	yes	yes
N	422	340	340

Source: authors' calculations.
Notes: ROA: return on assets; ROAP: projection of return on assets. ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10% while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects. The original baseline regressions in Table 1 have been extended to gauge the role of forward-looking variables, represented by ROAP, Price-to-Book, Economic consensus change index and Economic forecast uncertainty index.

The analysis is subsequently extended to investigate other forward-looking variables. First, building on Park (1999), Crouzille et al (2004), and Lepetit et al (2017), a model-based forward-looking profitability proxy is constructed (Annex 2). The rationale for this approach is to check if bank-specific and macroeconomic fundamentals, which should be taken into account by market analysts, as evidenced by Anolli et al (2014) for European banks, have some impact on bank dividend policy. In constructing the model that generates a fundamental-based profitability proxy for banks, we follow Borio et al (2017) and include both bank-specific and macroeconomic variables. The proxy is moved forward by one year to account for a forward-looking nature of the exercise. Second, market-based economic uncertainty is approximated by Citi's indices of economic forecast uncertainty and consensus change. Similarly to the evidence from the price-to-book ratio, neither the model-based forward-looking profitability proxy nor market-based economic uncertainty variables suggest that banks account for forward-looking variables when setting dividend payout policy (Table 3). These results are subject to some caveats though. The lack of significant relationship can be driven by measurement error because the proxies for forward-looking variables may only to a certain extent capture future econmic conditions and uncertainty.

4.7 Robustness Checks

We ran a significant set of robustness checks. They aim at examining the sensitivity of our estimates to a different definition of capital adequacy, profitability, and size, as well as additional variables capturing the tested hypotheses and stress episodes (Annex 3). Specifically:

- *Capital Adequacy*. In addition to the capital adequacy defined in terms of capital over risk-weighted assets, the same set of regressions is estimated based on the indicator defined in terms of capital over assets. The results do not qualitatively differ across Tobit specifications, although the capital over assets indicator loses statistical significance (Table A.3.1). This result likely reflects the fact that key prudential requirements are not set in terms of the capital over assets indicator, which only works as a backstop, but are binding in terms of capital over risk-weighted assets.

- *Size*. Similarly, in addition to size defined in terms of log of assets, the same set of regressions is estimated based on an alternative measure defined in terms of log of bank capitalization on the stock market. This definition of the variable should also capture to a certain extent a forward-looking dimension. The results do not materially change across the specifications, confirming the relevance of size for dividend payout policy, although the variable loses significance. This could be due to the higher degree of variability of this market-based measure. (Table A.3.2).

- *Profitability Indicators*. ROE is tested as an alternative to ROA. The results do not qualitatively differ across the board of various specifications, although the ROE indicator loses statistical significance (Table A.3.3).

- *Opacity*. Building on the asymmetric information hypothesis, an alternative forward-looking variable is constructed and tested in line with Park (1999) and Crouzille et al (2004). The fundamental-based model of profitability presented in Annex 2 can be

estimated based on publicly available data to generate residuals, which can be considered a proxy for financial analysts' forecast errors. According to this approach, the higher the forecast error, the higher is the information opacity. The results show no supportive evidence for this variable (Table A.3.4).

- *Growth Opportunities*. The impact of the growing balance sheet on dividend payouts of banks has been examined in the literature, as shown for example by Ashraf et al (2016) and Lepetit et al (2018). In principle, the higher the growth opportunity expressed in terms of loan book growth, the lower the expected dividend payout. The results confirm the relevance of this hypothesis (Table A.3.5).

- *Financial Crises*. Given that financial crises may exert pressure on banks, it is vital to analyze if/how dividend policy changes during stress episodes. We examine if (i) there was any significant change in the dividend payouts during the stress episodes; and (ii) whether the relationship between explanatory variables and the dividend payouts changed during the stress episodes. The dummy spanning the period of 2008–2012 is constructed and subsequently interacted with explanatory variables. There is only limited evidence of a statistically significant drop in payouts during the stress period. There is however some supportive evidence for the importance of capital during the stress episodes (Table A.3.6). This seems to be broadly consistent with the findings of Abreu and Gulamhussen (2013) who find the more prominent role of capitalization for bank dividend payouts during the Global Financial Crisis.

5. Policy Simulation

The Covid-19 crisis has been a watershed event in the regulators' approach to dividend policies. As outlined in Section 3, the ECB and several other regulators recommended banks to suspend dividend payouts within weeks from the outbreak of the crisis, and banks generally complied with this recommendation. A counterfactual simulation exercise based on the model presented in the previous sections can cast light on the scale of endogenous adjustment of dividend policies by banks which could have occurred in absence of the regulatory recommendations.[4] This simulation comes with a caveat that, as the Covid-19 crisis led to economic disruptions that were unprecedented in Europe in peace-time, the relationships identified from the data may have no longer held. Its results should therefore be viewed with some caution as the magnitude of the reduction in dividends would likely be understated.[5]

The simulation exercise shows that a significant part of bank profits would be paid out to shareholders. Using the econometric specifications (1) to (6) and actual realisations of capital and

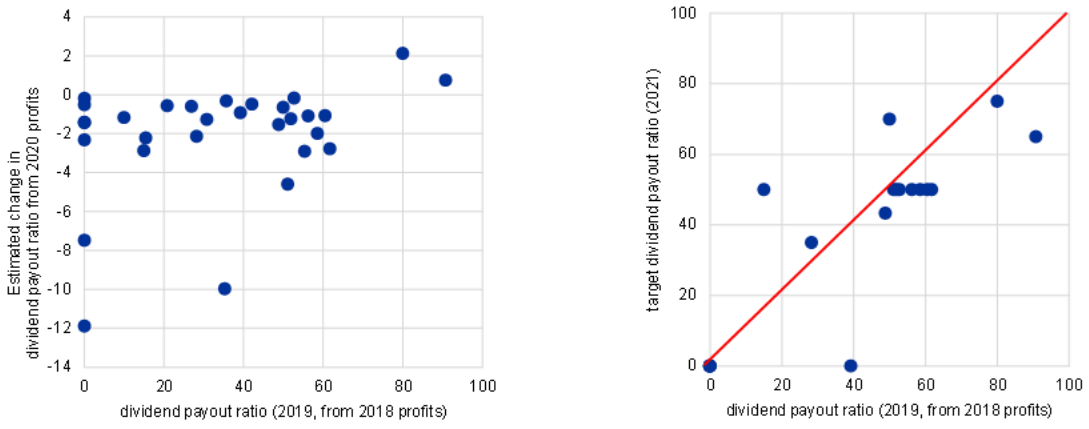
[4] The ECB communicated that the recommendation contributed to maintaining €27 billion of regulatory capital within the banking sector, which might have otherwise been paid out.

[5] The evidence from the stress period of GFC presented in Table A.3.6 does not suggest significant adjustments in payout policy during this stress episode. Given however the unprecedented magnitude of the Covid-19 shock, banks could potentially adjust their dividend payouts more than suggested by the fundamental drivers and differently than during the GFC.

profitability up to the third quarter of 2020, we estimate the counterfactual payout ratios for the sample of 30 listed euro area banks. The results suggest that payout ratios would be adjusted downward by most banks, although the adjustment would be small, up to 4 percentage points for most banks, reflecting the drop in profits and a broadly steady level of capital. Some of the banks estimated to decrease payouts did not pay any dividends in 2020 (Chart 6). Together with a projected moderate increase in payouts by two banks, this would lead to an almost unchanged total value of distributions of about EUR 19 billion for this group of banks.

The model-based simulation results produce a similar picture as that emerging from the banks' declarations concerning dividend payouts after the Covid-19 pandemic. Among the 30 listed banks for which counterfactual payout ratios are available, 19 banks have provided guidance on future dividend payouts to their shareholders in the last quarter of 2020 in either the quarterly financial reports, or in the statements separately issued to investors.[6] As supervisory restrictions were, at that time, scheduled to stay in place until at least September 2021, that guidance concerned payouts taking place after that date. It revealed that most banks planned to maintain a broadly unchanged level of distributions to shareholders once the restrictions would be abolished. The guidance tends to cluster around certain "round" values of the payout ratios, with many banks stating an intention to distribute 50% of their profits to shareholders. Barring that, which might create some artificial volatility relative to observed ratios, only a few banks would aim for a substantially changed payout ratios. This is in line with the findings from the models developed in this paper.

Figure 6: Counterfactual Dividend Payout Ratios in the Absence of Restrictions (left panel), and Banks' Own Payout Ratios targets (right panel)



Source: SNL Financial, authors' calculations.
Notes: the left panel shows the last observed dividend payout ratios prior to the imposition of dividend restrictions (x-axis) and counterfactual payout ratios in the absence of restrictions (y-axis). Conversely, the right panel shows banks' own guidance for post-restriction payout ratios (y-axis).

[6] While most banks guided to a specific payout ratios, a few banks provided a range. In such cases, we took the mid-point of the provided range to represent the most likely future payout ratio.

6. Conclusions

This paper investigated the drivers of bank dividend policies in the euro area. In line with existing literature, it found support for the three main hypotheses explaining how banks set the remuneration of their shareholders. The regulatory hypothesis, which links banks dividends to the constraints set by the need to comply with the prudential capital requirements, was found to play a prominent role in the actual empirical setting. Similarly, the agency cost hypothesis – under which larger banks which are more strongly affected by the principal-agent problems should pay higher dividends – was also found to be supported by empirical evidence, and received a high weight in explaining the overall variation in bank dividends. While the data also support the asymmetric information hypothesis, its weight relative to the other two explanations for changing bank dividends was found to be lower. The results presented in the paper are robust to the choice of proxy variables representing the three hypotheses and to the sample composition, holding for both a smaller group of larger, listed banks, and for a large group of mainly smaller and unlisted banks.

The results also suggest that banks could be myopic in setting their distribution policies and more focused on point-in-time compliance with capital requirements and current profitability. Specfically, the paper finds no significant relationship between dividend payouts and forward-looking variables, such as expected future economic developments and banks' future profitability.

The results imply that the regulatory recommendations issued during the Covid-19 crisis may have led banks to restrict dividend payouts by more than would have been the case in the absence of such restrictions. Counterfactual simulations, as well as public guidance provided by banks on the target post-pandemic payout ratios, support the view that the endogenous adjustments would have reduced dividend payouts only to a small extent. These results should, however, be interpreted with caution as they do not fully account for the unprecedented nature of the Covid-19 shock. This paper does not intend to enter into the debate on general adequacy of the dividend restrictions, which might be seen either as means to reinforce banks' balance sheets in anticipation of large future credit losses, or as a procyclical tightening of capital requirements in the midst of a crisis. Rather, the evidence contained here is an attempt to answer a narrowly framed question on the effectiveness of the restrictions with respect to the objective of maintaining the capital base of the banking sector.

Annex 1 – Data Definition and Sources

Table A.1: Variable Definitions and Sources

Variable	Definition	Source
Payout ratio	Dividends paid/total after-tax earnings	SNL/Orbis
ROA	Returns on assets	SNL/Orbis
ROE	Returns on equity	SNL/Orbis
Price-to-Book	Market price/book value	SNL/Orbis
ROAP	Returns on assets computed as predicted values based on the model of profitability fundamentals	Calculations based on the model drawing on Park et al (1999) and Borio et al (2017) based on SNL/Orbis
Opacity	Residuals from the model of profitability fundamentals	Calculations based on the model drawing on Park et al (1999) and Borio et al (2017) based on SNL/Orbis
Growth opportunities	Annual growth rate of bank assets	SNL/Orbis
Size	- Log(assets)	SNL/Orbis
	- Market capitalization of bank on the stock market	SNL/Orbis
Minority shareholder protection	The index of legal protection for outsider minority shareholders	World Bank
Capital	- Equity/risk-weighted assets	SNL/Orbis
	- Equity/assets	SNL/Orbis
Credit risk	Loan loss provisions/total loans	SNL/Orbis
GDP growth	Annual GDP growth	ECB SDW
Economic consensus change index	Change in economic consensus based on euro-denominated assets	Citi
Economic forecast uncertainty index	Change in forecast uncertainty based on euro-denominated assets	Citi

Annex 2 – Modelling Fundamental-Based Profitability

A.2.1 Conceptual Framework

The existing analytical framework provides guidance on mechanisms through which banking variables affect profitability. The basic model was developed by Ho and Saunders (1981) and subsequently extended by Angbazo (1997) and Maudos and Fernandez de Guevara (2004). It typically includes the impact of cost efficiency, capitalization, and size on bank margins. Banks that have a higher risk aversion are likely to be better capitalized and are perceived as more solvent, which should in principle reduce their funding costs and increase their margins (Ho and Saunders 1981). Banks tend to pass operating costs on to their clients because these costs tend to increase as a result of new transactions or additional services, which banks recuperate through charging higher margins (Maudos and Fernandez de Guevara 2004). The average transaction size represented by volume of loans should exert some negative impact on the margin because administrative overheads would be spread across a larger base, resulting in narrower margins (Angbazo 1997 and Maudos and Fernandez de Guevara 2004). But the negative effect can also be offset by a positive effect, as size may exert pressure through returns to scale, in line with the findings of Engle et al 2014 and Borio et al (2017).

Operating environment is also expected to have impact on profitability. Alessandri and Nelson (2015) have developed a model for analyzing the impact of macroeconomic factors that hinges on the strength of market power in the banking system. For the interest rate level, thanks to their market power, banks can pass increases in its funding cost through to final borrowers and shrink their lending quantities in response to higher funding costs. An improvement in economic conditions increases lending demand by households and firms and improves the financial conditions of borrowers, with positive effects on the profitability of the traditional financial intermediation activities (DeYoung and Rice 2004, Coffinet and Lin 2010, Albertazzi and Gambacorta 2009). Banks tend to generate higher income when stock markets perform better (Lehmann and Manz 2006, Kok et al 2019, Gross et al, 2021).

A.2.2 Econometric Methodology

Following the literature on bank profitability encompassing banking and macroeconomic variables, variants of the following equation are estimated:

$$ROA_{it} = \alpha_0 + \sum_{j=1}^{p} \alpha_1 ROA_{it-j} + \sum_{k=1}^{l} \alpha_{2,k} BV_{k,it-j} + \sum_{k=1}^{m} \alpha_{3,k} MFV_{k,it-j} + \varepsilon_{it}$$

where ROA denotes return on assets in bank i at time t, which is explained by banking variables (BV) and macroeconomic and financial variables (MFV). The estimated models also include the lagged dependent variable to account for some persistence associated with the balance sheet structure.

Standard GMM estimators serve as benchmarks. The initial step involves employing the first-difference estimator to examine the effect of relaxing the strict exogeneity assumption in the dynamic panel model (Wooldridge, 2009). Building on the approach taken by Borio et al (2017), this is followed by employing both first-difference and system GMM estimators because of their

ability to account for endogeneity of regressors (Arellano and Bond 1991; Blundell and Bond 1998).

A.2.3 Results

In line with the predictions of the theoretical underpinnings, there is broad support for both banking and macroeconomic variables explaining profitability. For banking variables, consistent with the evidence presented in Borio et al (2017) and Jarmuzek and Lybek (2018, 2020), banks with higher operating costs and risk aversion tend to have higher margins, while those with higher transaction size tend to have lower margins. For macroeconomic and financial variables, in line with the findings of Claessens et al (2018) and Kok et al (2019), there is solid evidence that interest rates, economic growth, and stock market performance have some bearing on profitability.

Table A.2.1: Results from the Bank Profitability Model

	(1)	(2)	(3)
Dep. Variable: ROA	diff	diff GMM	sys GMM
Lagged ROA		0.330***	0.505***
		(0.0492)	(0.0137)
OPEX	0.333***	0.159***	0.0163**
	(0.0556)	(0.0307)	(0.00730)
Capital	0.00376	0.0826***	0.0462***
	(0.0167)	(0.0183)	(0.00110)
Size	0.474***	0.153	0.0209***
	(0.161)	(0.170)	(0.00652)
Short-term rate	0.0736***	0.0844***	0.00896***
	(0.0132)	(0.0282)	(0.000975)
GDP growth	0.0103***	0.00538**	0.0274***
	(0.00394)	(0.00220)	(0.00266)
Stock market	0.00133***	0.00122**	0.00224***
	(0.000421)	(0.000568)	(0.000106)
Arellano-Bond AR(1) test		0.024	0.023
Arellano-Bond AR(2) test		0.529	0.756
N	389	143	204

Source: authors' calculations.
*Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10%, while standard errors are reported in parenthesis. The table shows the results for first-difference regression (1) first-difference GMM regression and system GMM regression (3) for the estimation of ROA.*

Annex 3 – Robustness checks

Table A.3.1: Alternative "Capital" Variable

Dep variable: dividend payout ratio	(1) RE	(2) Tobit	(3) RE	(4) Tobit	(5) RE	(6) Tobit
Lagged dividend payout ratio	0.628***	0.648***	0.612***	0.610***	0.608***	0.667***
	(0.0443)	(0.0394)	(0.0438)	(0.0416)	(0.0458)	(0.0320)
Capital	-0.131	0.0677	-0.0644	0.313	0.487	0.529
	(0.520)	(0.494)	(0.546)	(0.568)	(0.658)	(0.576)
ROA	2.398***	2.928***	2.526***	3.353***	2.548***	2.738***
	(0.765)	(0.693)	(0.715)	(0.821)	(0.676)	(0.649)
Size	3.889	3.755	4.607	3.973	4.318	4.944
	(3.306)	(2.789)	(3.433)	(3.120)	(3.739)	(3.299)
Minority shareholder protection			2.263***	3.052***	1.869**	2.214***
			(0.678)	(0.833)	(0.771)	(0.671)
Credit risk					-4.772**	-5.928***
					(2.208)	(1.977)
GDP growth					-0.366	-0.555
					(0.881)	(0.685)
Time effects	yes	yes	yes	yes	yes	yes
N	484	484	439	439	378	378

Source: authors' calculations.

*Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10% , while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects and Tobit for different specifications and only for listed banks. Regressions are computed for an unbalanced panel over the period 2005–2019. The independent variable "Capital" is calculated as the ratio between "Equity" and "Total assets", alternatively from Table 1 where it *is calculated as the ratio between "Equity" and "RWA".*

Table A.3.2: Alternative "Size" Variable

Dep variable: dividend payout ratio	(1) RE	(2) Tobit	(3) RE	(4) Tobit	(5) RE	(6) Tobit
Lagged dividend payout ratio	0.616***	0.613***	0.590***	0.587***	0.585***	0.648***
	(0.0484)	(0.0400)	(0.0477)	(0.0411)	(0.0478)	(0.0329)
Capital	0.698*	0.777***	1.007***	1.053***	0.818**	0.633**
	(0.371)	(0.266)	(0.367)	(0.295)	(0.355)	(0.270)
ROA	1.907**	2.366***	1.737**	2.314***	1.646**	1.954***
	(0.756)	(0.689)	(0.713)	(0.771)	(0.741)	(0.615)
Size	1.126	1.840	1.584	2.351	3.452	4.864*
	(2.894)	(2.457)	(2.965)	(2.706)	(3.225)	(2.583)
Minority shareholder protection			2.642***	3.316***	2.176***	2.423***
			(0.706)	(0.826)	(0.787)	(0.675)
Credit risk					-3.190*	-4.365**
					(1.653)	(1.745)
GDP growth					-0.382	-0.599
					(0.936)	(0.678)
Time effects	yes	yes	yes	yes	yes	yes
N	480	480	436	436	377	377

Source: authors' calculations.

Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10% while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects and Tobit for different specifications and only for listed banks. Regressions are computed for an unbalanced panel over the period 2005–2019. The independent variable "Size" is calculated as the "Market capitalization", alternatively from Table 1 where it is calculated as the "logarithm of lotal assets".

Table A.3.3: Alternative Profitability Variable (ROE)						
Dep variable:	(1)	(2)	(3)	(4)	(5)	(6)
Dividend payout ratio	RE	Tobit	RE	Tobit	RE	Tobit
Lagged dividend payout ratio	0.624***	0.629***	0.591***	0.605***	0.593***	0.661***
	(0.0448)	(0.0388)	(0.0444)	(0.0403)	(0.0451)	(0.0325)
Capital	0.775**	0.941***	1.063***	1.204***	0.885**	0.769***
	(0.366)	(0.254)	(0.367)	(0.280)	(0.351)	(0.249)
ROE	1.669**	1.900***	1.680**	2.002***	1.474**	1.602***
	(0.660)	(0.598)	(0.662)	(0.666)	(0.693)	(0.530)
Size	0.376*	0.481**	0.411*	0.521**	0.572**	0.687***
	(0.201)	(0.192)	(0.222)	(0.210)	(0.232)	(0.215)
Minority shareholder protection			2.668***	3.318***	2.119***	2.344***
			(0.695)	(0.810)	(0.787)	(0.674)
Credit risk					-1.882	-2.539
					(1.511)	(1.690)
GDP growth					-0.446	-0.651
					(0.915)	(0.681)
Time effects	yes	yes	yes	yes	yes	yes
N	489	489	444	444	383	383

Source: authors' calculations.

*Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10%, while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects and Tobit for different specifications and only for listed banks. Regressions are computed for an unbalanced panel over the period 2005–2019. The profitability variable is now "ROE" (Return On Equity), alternatively from Table 1 where "ROA" (Return On Assets) is used*

.

Table A.3.4: "Opacity" as a Measure of Information Asymmetry		
Dep variable:	(1)	(2)
Dividend payout ratio	RE	Tobit
Lagged dividend payout ratio	0.588***	0.656***
	(0.0459)	(0.0376)
Capital	0.792**	0.633**
	(0.341)	(0.307)
ROA	9.178*	10.64**
	(5.393)	(4.859)
Size	2.042***	2.296***
	(0.646)	(0.688)
Minority shareholder protection	2.373***	2.611***
	(0.799)	(0.793)
Opacity	-7.582	-6.698
	(8.325)	(7.770)
GDP growth	-0.506	-0.707
	(1.017)	(0.812)
Credit risk	-4.314**	-5.324**
	(1.938)	(2.281)
Time effects	yes	yes
N	383	383

Source: authors' calculations.

*Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10%, while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects and Tobit only for listed banks. The regressions are computed for an unbalanced panel over the period 2005–2019. The baseline regression in Table 1 has been extended to include the independent variable "Opacity", calculated through the residuals from the model of profitability fundamentals (drawing on Park et. (1999) and Borio et al (2017)) and it reflects information asymmetries as explained in Section 4.*

Table A.3.5: "Growth Opportunity" as a Measure of Information Asymmetry

Dep variable:	(1)	(2)
Dividend payout ratio	RE	Tobit
Lagged dividend payout ratio	0.587***	0.654***
	(0.0467)	(0.0381)
Capital	0.824**	0.657**
	(0.342)	(0.308)
ROA	7.189**	8.921***
	(3.193)	(3.275)
Size	1.887***	2.155***
	(0.671)	(0.670)
Minority shareholder protection	2.092***	2.397***
	(0.727)	(0.798)
Growth opportunity	-0.260*	-0.229*
	(0.156)	(0.124)
GDP growth	-0.245	-0.468
	(0.946)	(0.795)
Credit risk	-3.535**	-4.693**
	(1.599)	(2.032)
Time effects	yes	yes
N	377	377

Source: authors' calculations.

*Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10%, while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects and Tobit only for listed banks. The regressions are computed for an unbalanced panel over the period 2005–2019. The baseline regression in Table 1 has been extended to include the independent variable "Growth opportunity", calculated as the annual growth rate of bank assets and reflect information asymmetries as explained in Section 4.*

Table A.3.6: Impact of Financial Crises		
Dep variable:	(1)	(2)
Dividend payout ratio	RE	Tobit
Lagged dividend payout ratio	0.579***	0.647***
	(0.0446)	(0.0376)
Capital	0.0602	-0.121
	(0.639)	(0.499)
Size	1.499*	1.708*
	(0.902)	(0.970)
ROA	6.095	6.559
	(4.921)	(4.659)
Minority shareholder protection	2.415*	2.691**
	(1.347)	(1.140)
GDP growth	-1.226	-1.184
	(1.746)	(1.139)
Credit risk	-4.454	-4.947
	(3.573)	(3.241)
Crisis dummy	-4.30	-4.31**
	(27.37)	(2.17)
Crisis dummy * Capital	1.286*	1.284**
	(0.698)	(0.625)
Crisis dummy * Size	0.688	0.808
	(1.359)	(1.333)
Crisis dummy * ROA	0.603	3.023
	(7.590)	(6.357)
Crisis dummy * Minority shareholder protection	-0.608	-0.682
	(1.892)	(1.577)
Crisis dummy * GDP growth	1.589	1.143
	(2.198)	(1.576)
Crisis dummy * Credit risk	4.188	3.397
	(4.494)	(4.225)
Time effects	yes	yes
N	383	383

Source: authors' calculations.

Note: ***, ** and * denote statistical significance at the levels of, respectively, 1%, 5% and 10%, while standard errors are reported in parenthesis. The table shows the results for panel regressions with random-effects and Tobit only for listed banks. The regression are computed for an unbalanced panel over the period 2005–2019. The baseline regression in Table 1 has been extended to include the "Crisis dummy" (and its interaction) which takes 1 in the period 2008–2012 and 0 elsewhere, as explained in Section 4.

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