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PAYOUT POLICY DURING MARKET-WIDE FINANCIAL CONSTRAINTS: EVIDENCE FROM THE COVID-19 DOWNTURN

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Abstract

Share repurchases are perceived as a flexible payout mechanism as it distributes free cash flow while mitigating the risk of underinvestment. It may be simpler to stop or trim share repurchases than dividend payments. We test the flexibility hypothesis of share repurchases using the Covid-19 economic crisis as a natural experiment where firms encounter a sudden cash-flow uncertainty. We employ a balanced panel of S&P 1500 firms from the period 2014 to 2021. Our results are consistent with the view that share repurchases offer more flexibility than dividends. Firms are likely to reduce share repurchases when they are cash constrained but still maintain dividend payouts. However, firms are also likely to trim dividends if the financial constraints persist.

JEL Codes: G32; G35.

Keywords: Covid-19 pandemic, dividends, payout policy, share repurchases.

1. Introduction

The optimum payout policy returns sufficient free cash flow to shareholders, thus mitigating the risk of overinvestment while preserving access to the capital needed to fund value-enhancing investments. Oded (2020) suggests that firms adopt a combination of dividend payouts and share repurchases that provide flexibility to maintain cash when profitable investment opportunities exist. Since dividend payments are perceived as more consistent, share repurchases add flexibility to payout policies, reducing the risk of underinvestment. On the other hand, dividends serve as a mechanism that reduces the agency costs of free cash flow and decreases overinvestment as managers commit to consistently paying dividends (Jensen, 1986). Hence, managers are subject to additional scrutiny: the capital required to finance new investments must be raised externally (Easterbrook, 1984; La Porta et al., 2000; Moh'd et al., 1995). It has been documented that firms employ dividends to convey positive news to the market, signalling a positive financial future (Baker et al., 2002; Esqueda, 2016; Miller & Rock, 1985; La Porta et al., 2000). Given that the main function of a payout policy is to distribute free cash flows back to investors, DeAngelo et al. (2006) suggest that the primary determinant of dividend policy is a firm's life-cycle stage. Hence, the optimal payout policy of mature firms typically involves higher dividend payouts because their retained earnings (investment opportunities) tend to be relatively high (low). This study examines the share repurchase flexibility hypothesis when firms face economy-wide cash constraints, such as those experienced during the Covid-19 period. We attempt

to answer the question of what form of payout firms are more likely to reduce given an environment with perceived financial constraints.[1]

Grullon and Michaely's (2002) substitution hypothesis indicates that firms tend to substitute dividends with share repurchases mainly because of their more favourable tax treatment relative to dividend payments. Further evidence shows that firms appear to finance share repurchase programs with capital that would otherwise have been used to pay dividends (Grullon and Michaely, 2002). However, Lee and Rui (2007) find that dividends and share repurchases are imperfect substitutes; share repurchases are more dependent on the temporary variation in earnings, suggesting that repurchases are more reliant on temporary free cash flows. Hence, firms choose a more flexible way to distribute cash to shareholders, such as open market share repurchases, particularly when future free cash flow is uncertain. Share repurchases can also be perceived as a signalling mechanism; when announcing share repurchase programs, firms reveal their belief that their shares are undervalued (Hackethal and Zdantchouk, 2006; Comment and Jarrell, 1991; D'mello and Shroff, 2000). Since Covid-19 has had a negative impact on share prices, well-capitalized firms have an opportunity to invest in their own (undervalued) shares.

Some authors have studied changes in dividend policy during the Covid-19 period; however, the evidence is inclusive. Whereas Krieger et al. (2021) and Zheng (2022) find that the Covid-19 economic recession negatively affected dividend policies, Mazur et al. (2021) and Ali (2022) find that most firms' dividend policies were not significantly affected. Our study contributes to the literature by examining changes in dividend payouts relative to share repurchases when firms face economy-wide financial constraints. To our knowledge, this is the first study to analyse the flexibility hypothesis in the context of the Covid-19 economic crisis. We examine the share repurchase flexibility hypothesis using Covid-19 as a natural experiment in which firms face financial constraints. Our results are consistent with the share-repurchase flexibility hypothesis, as firms initially reduce share repurchases when they are cash constrained but maintain dividends. However, firms are also likely to trim dividends if they continue to face financial hardships. In addition, our proxy for firm maturity indicates that more mature firms are more likely to pay dividends, which is consistent with the dividend life cycle hypothesis.
The remainder of this paper is organized as follows. The next section presents a detailed description of our sample and data. Section three outlines the methodology used in the study. Section four analyses the results, and Section five concludes.

2. Sample and Data Description

In this section, we first define the sample of firms and proceed to define the payout and independent variables used in this study. Our final sample comprises a balanced panel of 1,048 nonfinancial S&P1500 firms (totalling 8,384 firm-year observations) which we observe each year from 2014 to 2021.[2] As is common in payout studies, we exclude firms in the financial and utility sectors. Our data is from the Worldscope segment available in Refinitiv Eikon (formerly Thompson Reuters). Of the 1,048 firms, 430 firms are "switch-hitters", i.e., they simultaneously pay dividends and repurchase shares (see bottom of Table 1). A total of 258 firms neither pay dividends nor repurchase shares, while 234 (126)

[1] Frino et al. (2022) state that the Covid-19 pandemic led to a liquidity crash and a major crisis of confidence in financial markets comparable to the Global financial crisis of 2008.

[2] The 1,048 firms are in one of eight international classification benchmark (ICB) industries. These are technology (159 firms); telecommunications (37); health care (20); consumer discretionary (231); consumer staples (67); industrial (260); basic materials (60); and energy (62).

choose to use only repurchases (dividends) to return cash to shareholders.[3] Firms are more likely to return cash to shareholders through repurchases rather than dividends. Repurchase amounts are greater than dividend amounts. Firms are more likely to change their repurchases than dividends (in either direction). Next, we outline the shareholder payout (dividend and share repurchase) variables and describe the set of independent variables employed in each dividend and share repurchase regression.

Table 1: Variable and sample description

Variable	Summary Statistics					Source	Coverage
	Mean	p25	Median	p75	Stdev		
Dividends per share	0.68	0.00	0.20	1.00	1.02	Eikon	2014-2021
Dividends-sales	0.02	0.00	0.00	0.03	0.04	Eikon	2014-2021
Repurchases-sales	0.04	0.00	0.01	0.05	0.08	Eikon	2014-2021
Dividend share	0.41	0.00	0.31	0.81	0.38	Eikon	2014-2021
Dividend payer	0.55	0.00	1.00	1.00	0.50	Eikon	2014-2021
Repurchase payer	0.67	0.00	1.00	1.00	0.47	Eikon	2014-2021
Dividend increase	0.12	0.00	0.00	0.00	0.33	Eikon	2014-2021
Dividend decrease	0.04	0.00	0.00	0.00	0.20	Eikon	2014-2021
Dividend omission	0.01	0.00	0.00	0.00	0.12	Eikon	2014-2021
Repurchase increase	0.19	0.00	0.00	0.00	0.39	Eikon	2014-2021
Repurchase decrease	0.22	0.00	0.00	0.00	0.41	Eikon	2014-2021
Repurchase omission	0.07	0.00	0.00	0.00	0.26	Eikon	2014-2021
Firm size	8.10	7.01	7.99	9.14	1.58	Eikon	2014-2021
Leverage	0.56	0.40	0.55	0.71	0.24	Eikon	2014-2021
Profitability	0.05	0.02	0.06	0.10	0.13	Eikon	2014-2021
Profit volatility	5.50	1.61	3.06	6.24	7.17	Eikon	2014-2021
Firm growth	0.13	(0.01)	0.06	0.16	0.32	Eikon	2014-2021
Growth opportunities	2.35	1.11	1.67	2.81	1.99	Eikon	2014-2021
Cash holdings	0.18	0.04	0.11	0.24	0.19	Eikon	2014-2021
Firm age (in years)	33.85	16.00	25.00	39.00	28.48	Eikon	2014-2021
Industry dummies	nm	nm	nm	nm	nm	Eikon	2014-2021
Sample description by payout status							
	Div & Rep	**Div-only**	**Rep-only**	**Non-payer**	**Total**		
Observations	3,617	1,007	2,011	1,749	8,384		
Firms	430	126	234	258	1,048		

Note: This table describes the variables used in this study (top panel) and the sample of firms by payout status (bottom panel). Dividends per share is dividends to common shares outstanding. Dividends-sales are dividends paid to common shareholders to net sales. Repurchases-sales is repurchasing to net sales. Dividend share is common dividends to the sum of dividends and repurchases. Dividend payer equals 1 if the firm pays a dividend in year t. Repurchase payer equals 1 if the firm repurchases shares in year t. Dividend increase (decrease) equals 1 if the firm increases (decreases) dividends in year t by at least 12.5% (and not more than 500% for increases). Dividend omission equals 1 if the firm omits a dividend in year t. Repurchase increase (decrease) equals 1 if the firm increases (decreases) repurchases in year t by at least 12.5% (but not more than 500% for increases). Repurchase omission equals 1 if the firm omits a dividend in year t. Firm size is the log of book assets in millions of US$. Leverage is total liabilities to total assets. Profitability is return on assets measured as earnings before interest and taxation to book assets. Profit volatility is the five-year standard deviation of profitability. Firm growth is the one-year growth in book assets. Growth opportunities is market (debt + market capitalization) to book of assets. Cash holdings is cash to assets. We measure firm age using firm incorporation dates. Industry dummies are ICB industry dummies.

2.1 Payout Variables

In this study, we examine the dividend and share repurchase policies of a sample of nonfinancial S&P1500 firms in the period surrounding the 2020-21 Covid-19 pandemic period. We focus on payout amount and payout incidence. In terms of payout amounts, we scaled each dividend and shared

[3] Skinner (2008) and Floyd et al. (2015) document the fall in the number of firms that pay dividends but do not repurchase shares; the number of industrial firms that use dividends only fell from 57.2% in 1980 to 14.6% in 2012. The decline partly reflects the rise in the popularity of share repurchases over time.

the repurchase amount by sales. We focus on dividends paid to ordinary shareholders and scale dividends paid to ordinary shareholders by net sales (Div-sales). Dividends are set to missing if the sales data is not available through Refinitiv Eikon. We also track share repurchase amounts and scale repurchase amounts by net sales.[4] We augment these measures using several indicator variables that quantify the incidence of payouts. The reference case for each of these indicator variables equals to firms that make no payouts. The first measure, "Div-payer" equals one if a firm pays a dividend in year t (zero otherwise); "Rep-payer" equals one if the firm repurchases shares in year t (zero otherwise), and "Div and Rep" equals one if the firm is a "switch-hitter" that is, the firm simultaneously pays a dividend and repurchases shares in year t (zero otherwise). We also examine the incidence of dividend and share repurchase omissions over the sample period. Hence, to this list of indicator variables, we add the variable "Div-omission" which equals one if the firm omits a dividend in year t (zero otherwise), and "Rep-omission" which equals one if the firm omits a repurchase in year t (zero otherwise).

2.2 Independent Variables

We control for a range of variables shown in previous studies that influence shareholder payouts (DeAngelo et al., 2006; Von Eije and Megginson, 2008; Brockman and Unlu, 2009). The firm-specific variables included in our regression models are (1) firm size (measured as the log (book assets) in millions of US$), (2) firm growth (one-year growth in book assets), (3) growth opportunities measured using the market to book of assets (market capitalization plus book debt scaled by book assets, (4) profitability (return on assets measured as earnings before interest and taxation to book assets); (5) profit volatility measured as the five-year standard deviation in profitability; (6) leverage (total liabilities to book assets), (7) cash holdings (cash to book assets); and (8) firm age (log (firm age) using firm incorporation dates from Eikon).[5] In all regressions, we control for the influence of industry on payouts by including industry fixed effects based on the industry classification benchmark industry codes. Table 1 presents and summarizes the variables used in this study.

3. Methodology

We examine the influence of the Covid-19 pandemic on both the amount of and the likelihood of shareholder payouts. First, we focus on the likelihood of making shareholder payouts, and begin by estimating a series of logistic regressions of the following form:

$$Prob(Payer_{it}) = 1 = F(\beta_0 + \beta_1 Covid - year\ is\ 2020_t + \beta_2 Covid - year\ is\ 2021_t + Controls_{it} + Industry_{it})\ (1)$$

We date the Covid-19 pandemic period as having spanned the years 2020 and 2021. Importantly, we do not assume the influence of Covid-19 on shareholder payouts was the same in each year of the pandemic. To allow for each year of Covid-19 to have a heterogenous influence on the shareholder payouts of firms, we create two indicator variables, namely "Covid – year is 2020" and "Covid – year is 2021". "Covid – year is 2020" equals 1 in 2020 (0 otherwise) and "Covid – year is 2021" equals 1 in 2021 (0 otherwise). Previous years (2014-2019) are coded as zero and serve as our reference period. "Controls" and "Industry" refer to a full set of firm and industry-level determinants of shareholder payouts, defined earlier.

We estimate five variations of Eq. (1), with each variation determined using a different binary dependent or payout variable. Table 3 presents marginal effects from pooled logit regressions with

[4] Our material findings do not change when we scale each of the common dividends and share repurchases by book assets. We do not scale dividends using earnings because negative earnings render dividend payout ratios meaningless. Missing repurchases are set to zero.

[5] We use firm age to capture the influence of life-cycle on dividend payouts. Our results do not change when we replace firm age with the RE/TE measure of DeAngelo et al. (2006).

payer variables as follows: (1) "Div-payer" (1 if a firm pays a dividend in year t, zero otherwise); (2) "Rep-payer" equals one if the firm repurchases shares in year t (zero otherwise); (3) "Div and Rep" equals one if the firm simultaneously pays a dividend and repurchases shares in year t, zero otherwise; (4) "Div-omit" equals 1 if the firm omits a dividend in year t, zero otherwise); and (5) "Rep-omit) equals 1 if the omits a share repurchase in year t, zero otherwise.

Next, we examine whether the Covid-19 pandemic influenced the dividend and share repurchase amounts paid by firms in 2020 and 2021. Dividend and share repurchase amounts are measured by scaling each of dividends (Div-Sales) and repurchases (Repurchases-Sales) by sales, respectively. To account for the censored nature of the payout variables, we estimate each regression using the Tobit estimator. Table 4 presents the marginal effects of the pooled Tobit regressions of the following form:

$$Payout_{it} = \beta_0 + \beta_1 Covid - year\ is\ 2020_t + \beta_2 Covid - year\ is\ 2021_t + Controls_{it} + Industry_{it} \quad (2)$$

Where $Payout_{it} = Payout^*_{it}\ if\ Payout^*_{it} > 0$, and is zero otherwise. The dependent or payout variables are Dividends-sales and Repurchase-sales, as indicated. In Tables 3, 4, and 5, we estimate the standard errors by assuming firm-level clustering (see Petersen, 2009). Similar to Table 4, in Table 5, we employ Model 2, where $Payout_{it}$ takes the form of either Dividends-Sales or Repurchases-Sales. In this table, we use subsamples of either "switch hitters" and Dividend payers or Share repurchase only firms.

Endogeneity is often a concern in corporate finance research. Specifically, when evaluating the effect of a treatment on the treated sample, the possibility of self-selection bias arises. This implies that the treatment variable and the error term may be correlated, $Corr(x_i, \varepsilon_i) \neq 0$. However, Bae et al (2021) states that the Covid-19 pandemic was completely unexpected and therefore represents a truly exogenous event. Hence, the expected correlation between the Covid-19 event and the error term in our econometric models is zero. Endogeneity should not represent a significant concern in our study. To our knowledge, related studies focusing on the Covid-19 event have not described any endogeneity concerns (i.e., Ali, 2022; Krieger et al., 2021; Zheng, 2022; Mazur et al., 2021; among others).

4. Analysis

For a preliminary analysis, we first consider Figures 1 and 2, and Table 2. In Figure 1, we present each of the dividends-to-sales and share repurchases-to-sales (top left), dividend increases and dividends decreases (top right), share repurchases increase and decrease (bottom left), and dividend and share repurchase omissions (bottom right) for each year from 2014 to 2021.[6] Figure 2 plots the proportion of each dividend payer, share repurchases, and firms that pay dividends and repurchase shares (top left) together with the proportion of dividend-only payers, repurchase-only payers (top right), and non-payers (bottom left). Table 2 takes a more focused view and examines whether dividend and share repurchase payouts are statistically different in 2020 and 2021 compared to payouts in 2019. The amount of share repurchases declined significantly during 2020 relative to 2019. The proportion of firms that complete share repurchases declined in 2021, and those that pay dividends and buyback their shares also declined in 2021 compared to pre-Covid levels. Both dividends-to-sales and the proportion of dividend payers declined in 2021 compared to 2019, albeit this decline is not statistically significant. Overall, the univariate results are consistent with our findings in multivariate tests.

[6] Note Figure 1 distinguishes between large (>12.5%) and all increases/decreases in shareholder payouts. Grullon et al. (2002) require that dividends must change (increases and decreases) by at least 12.5% (and not more than 500% for dividend increases) to be economically important increases/decreases. We adopt the same convention for share repurchases.

Table 2: Univariate comparisons

	2019	2020	2021	2019 vs. 2020	2019 vs. 2021
Div-payer	0.573	0.564	0.540		
Rep-payer	0.697	0.677	0.656		**
Div and Rep	0.710	0.695	0.658		**
Div-Sales	0.023	0.023	0.021		
Rep-Sales	0.044	0.035	0.045	***	

Note: This table reports the proportion of firms that are dividend payers, repurchase payers, and dividend and repurchase payers. It also reports the amount of dividends-to-sales (Div-Sales) and repurchases-to-sales (Rep-Sales), as indicated, in 2019, 2020, and 2021. Dividend payer equals 1 if the firm pays a dividend in year t. Repurchase payer equals 1 if the firm repurchases shares in year t. Div and Rep equal 1 if the firm simultaneously pays a dividend and repurchases shares in year t. Div-Sales is dividends paid to common shareholders to net sales and Rep-Sales is repurchases to net sales. ***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

Figure 1

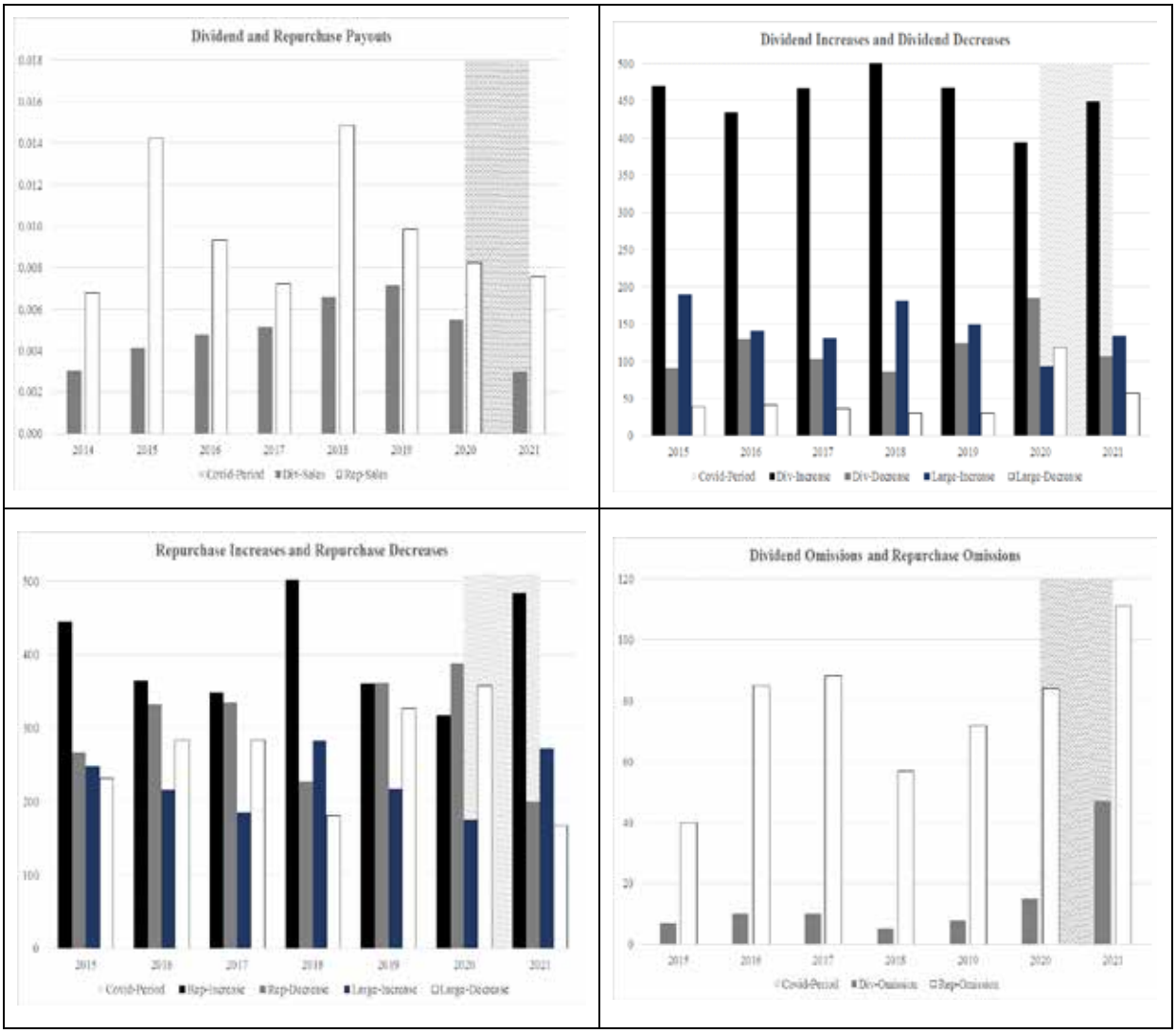
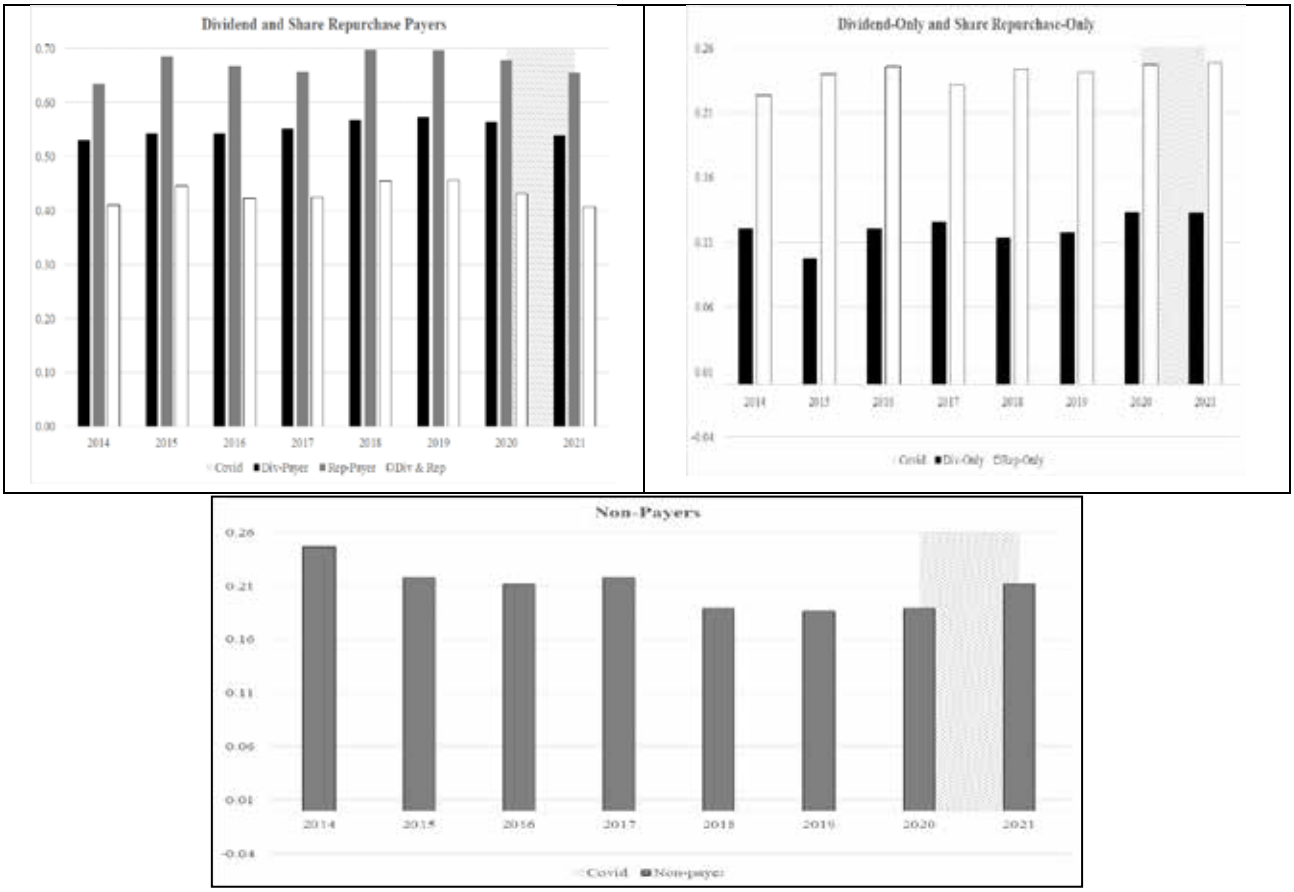


Figure 1 reveals a distinct influence of the Covid-19 pandemic on shareholder payouts. Dividend and share repurchase amounts are lower in 2020 and 2021 than in 2019 (although only repurchase amounts are statistically significantly lower in Covid times according to Table 2), while dividend decreases, and

omissions peak in the 2020/21 period. So, too, do repurchase omissions. Figure 2 shows that the number of dividend-paying firms and share-repurchasing firms has fallen since 2019 (once again, only repurchases are statistically significantly lower in Covid times). So, too has the number of "switch-hitters" fallen. However, the number of dividend-only, and to a lesser extent repurchase-only firms, has risen since 2019, which suggests that "switch-hitters" have not completely abandoned shareholder payouts altogether with the onset of the Covid-19 pandemic.

Figure 2



We turn next to the multivariate analysis and the marginal effects from the logit and Tobit regressions. We begin with Table 3, which states that the likelihood of making shareholder payouts has decreased with the onset of the Covid pandemic. Relative to the 2014-2019 period, the likelihood of a firm making payouts remained the same in 2020 (in fact, it increased for switch-hitters) but decreased in 2021. The likelihood of paying a dividend (repurchasing shares) decreased from 0.792 (0.820) in the pre- Covid period to 0.663 (0.746) in 2021. Changes in dividends and share repurchase propensities are economically significant and larger for dividends; the likelihood of making shareholder payouts decreased by 16.29% for dividends and 9.02% for repurchases. When comparisons were made with the 2014-2019 period, firms were no more likely to omit a dividend in 2020 but were more likely to do so in 2021. Repurchase omissions were most likely in 2020 and 2021 compared to the reference period.

Overall, Table 2 shows that the likelihood of paying a dividend and/or repurchasing shares remained the same in 2020, the first year of the pandemic, but fell in 2021. It is only in 2021 that the likelihood of returning cash to shareholders, either in the form of dividends or share repurchases, fell. Dividend omissions and share repurchase omissions were at their highest in 2021, the second year of the pandemic. Among the independent variables, firm size, profitability, profit volatility, growth, and firm age, are consistently statistically significant determinants of the likelihood of making shareholder

payouts. The likelihood of making shareholder payouts (dividends, repurchases, dividends, and repurchases) increases with firm size, profitability, and firm age and decreases with profit volatility and firm growth.

Table 3: The Covid-19 pandemic and the likelihood of making shareholder payouts

	Dependent variable is				
	(1) Div-payer	(2) Rep-payer	(3) Div and Rep	(4) Div-Omit	(5) Rep-Omit
Covid – year is 2020	0.017	0.013	0.045*	0.003	0.027***
	(0.95)	(0.89)	(1.74)	(1.43)	(3.09)
Covid – year is 2021	-0.129***	-0.074***	-0.156***	0.021***	0.056***
	(5.63)	(4.33)	(5.17)	(5.15)	(5.67)
Log (firm size)	0.088***	0.051***	0.122***	-0.000	-0.005***
	(7.47)	(6.54)	(7.44)	(0.85)	(2.44)
Leverage	0.109	0.032	0.164*	0.010***	0.008
	(1.63)	(0.76)	(1.84)	(4.52)	(0.64)
Profitability	1.661***	0.995***	2.670***	-0.006	-0.078***
	(8.69)	(8.39)	(9.80)	(1.39)	(2.99)
Profit volatility	-0.013***	-0.004**	-0.021***	0.001***	-0.000
	(3.57)	(2.35)	(4.09)	(3.07)	(0.27)
Firm growth	-0.178***	-0.134***	-0.286***	-0.001	0.022***
	(6.90)	(7.00)	(7.95)	(0.42)	(3.11)
Growth opportunities	-0.008	-0.009*	-0.017	-0.002***	-0.004**
	(0.91)	(1.72)	(1.33)	(3.72)	(1.98)
Cash holdings	-0.243**	-0.079	-0.236	0.005	-0.053**
	(2.33)	(1.37)	(1.62)	(1.31)	(2.50)
Log (firm age)	0.146***	0.081***	0.175***	-0.001	0.002
	(7.08)	(6.63)	(6.09)	(1.12)	(0.51)
Observations	6,373	7,377	5,366	8,384	8,384
Industry dummies	Included	Included	Included	Included	Included
R-squared	0.455	0.302	0.484	0.186	0.022
	Predicted dividend/repurchase amounts				
Pre-Covid period (2014-2019)	0.792	0.820	0.634	0.003	0.05
Covid – year is 2020	0.809	0.833	0.729	0.006	0.08
Covid – year is 2021	0.663	0.746	0.528	0.024	0.11
	Test: 2020 versus 2021				
2020 versus 2021	***	***	***	***	**

Note: This table reports marginal effects from pooled logit regressions for a sample of 1,048 firms. The sample period is 2014-2021. The dependent variables are the dividend payer, repurchase payer, dividend and repurchase payer, dividend omission, and repurchase omission, as indicated. Dividend payer equals 1 if the firm pays a dividend in year t. Repurchase payer equals 1 if the firm repurchases shares in year t. Div and Rep equals 1 if the firm simultaneously pays a dividend and repurchases shares in year t. The base case for each of these three dependent variables is non-paying firms. Dividend omission (Div-omit) equals 1 if the firm omits a dividend in year t. Repurchase omission (Rep-omit) equals 1 if the firm omits a repurchase in year t. Firm size is the log of book assets in millions of US$. Leverage is total liabilities to total assets. Profitability is return on assets measured as earnings before interest and taxation to book assets. Profit volatility is the five-year standard deviation of profitability. Firm growth is the one-year growth in book assets. Growth opportunities is market (debt + market capitalization) to book of assets. Cash holdings is cash to assets. We measure firm age using firm incorporation dates. We include but do not report industry dummies. ***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

In Table 4, the focus shifts to dividend and share repurchase amounts, where we present the marginal effects of the pooled Tobit regressions. The trends in dividend and share repurchase amount policies largely mirror those in Table 2. Dividend amounts remained the same in 2020 compared to their pre-Covid average but fell in 2021. In contrast, share repurchases fell in 2020 but remained the same thereafter. In 2021, the dividend amount fell by 27.79% relative to the pre- Covid period amount (compare 0.018 pre- Covid to 0.013 in 2021)). Share repurchase amounts fell by 14.89% between the pre- Covid period and 2020 (compare 0.047 pre- Covid to 0.040 in 2020)). Regarding control variables,

dividend and share repurchase amounts increase with firm size, leverage, and profitability. Firm growth and growth opportunities influence shareholder payout amounts differently; payouts increase with growth opportunities yet decrease with firm growth. The remaining control variables influence dividend and repurchase amounts but not both. For example, using firm age, there is evidence to support a life cycle in dividend payouts, but not in repurchase amounts.

Table 4: The Covid-19 pandemic and shareholder payout amounts

	Dependent variable is	
	(1) Div-Sales	(2) Repurchase-Sales
Covid – year is 2020	0.001	-0.006***
	(0.91)	(3.90)
Covid – year is 2021	-0.010***	-0.008***
	(7.08)	(4.43)
Log (firm size)	0.011***	0.007***
	(8.63)	(7.28)
Leverage	0.015*	0.023***
	(1.74)	(3.22)
Profitability	0.152***	0.195***
	(9.32)	(11.89)
Profit volatility	-0.001**	0.000
	(2.35)	(0.81)
Firm growth	-0.019***	-0.032***
	(6.41)	(7.99)
Growth opportunities	0.002**	0.003***
	(2.07)	(3.62)
Cash holdings	-0.006	0.027***
	(0.50)	(2.81)
Log (firm age)	0.011***	-0.002
	(5.45)	(1.60)
Observations	8,384	8,384
Industry dummies	Included	Included
	Predicted dividend/repurchase amounts	
Pre-Covid period (2014-2019)	0.018	0.047
Covid – year is 2020	0.018	0.040
Covid – year is 2021	0.013	0.039
	Test: 2020 versus 2021	
2020 versus 2021	***	

Note: This table reports marginal effects from pooled Tobit regressions for a sample of 1,048 firms. The sample period is 2014-2021. The dependent variables are dividends paid to common shareholders to net sales and repurchases to net sales, as indicated. Firm size is the log of book assets in millions of US$. Leverage is total liabilities to total assets. Profitability is return on assets measured as earnings before interest and taxation to book assets. Profit volatility is the five-year standard deviation of profitability. Firm growth is the one-year growth in book assets. Growth opportunities are market (debt + market capitalization) to book of assets. Cash holdings is cash to assets. We measure firm age using firm incorporation dates. We include but do not report industry dummies. ***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

In Table 5, we examine whether the trends in shareholder payouts that we observed in Table 4 are the same for firms that use either dividends, share repurchases or both, that is, switch-hitters. Switch-hitters may use the flexibility inherent in share repurchase payouts to maintain dividend payouts throughout 2020 and 2021. The results in Table 5 suggest that they do not; while dividend levels are maintained in 2020, they fall in 2021. For these firms, share repurchase amounts fell in 2020, but rather than maintain their dividends at pre- Covid (and 2020 levels), these firms chose to increase their repurchase amounts in 2021 (but they remain below pre-Covid levels). Firms that return cash to shareholders using only

repurchases decrease the repurchase amounts in 2020 but return them to their pre- Covid levels by 2021.

Table 5: The Covid-19 pandemic and the payout mix

	Dependent variable is			
	Div-Sales		Repurchase-Sales	
	(1) Div and Rep	(2) Div-only	(3) Div and Rep	(4) Rep-only
Covid – year is 2020	-0.000	0.001	-0.020***	-0.018***
	(0.02)	(0.20)	(6.64)	(3.06)
Covid – year is 2021	-0.005***	-0.007*	-0.012***	-0.008
	(3.56)	(1.83)	(3.64)	(1.16)
Log (firm size)	0.007***	0.004**	0.010***	0.011***
	(7.05)	(1.98)	(4.82)	(3.44)
Leverage	0.013*	0.020	0.044***	0.030
	(1.82)	(1.27)	(3.16)	(1.48)
Profitability	0.008	0.174***	0.204***	0.109***
	(0.39)	(4.13)	(6.02)	(2.65)
Profit volatility	0.001*	0.001	0.002***	0.001*
	(1.77)	(1.42)	(3.35)	(1.68)
Firm growth	-0.007***	-0.008	-0.044***	-0.044***
	(2.61)	(1.60)	(6.38)	(3.91)
Growth opportunities	0.008***	0.004**	0.009***	0.014***
	(7.35)	(2.10)	(4.07)	(7.12)
Cash holdings	0.036***	0.051**	0.074***	0.104***
	(3.34)	(2.19)	(3.50)	(3.75)
Log (firm age)	0.000	-0.005	-0.006**	-0.009**
	(0.02)	(1.40)	(2.46)	(2.07)
Observations	3,617	1,007	3,617	2,011
Industry dummies	Included	Included	Included	Included
R-squared	0.272	0.180	0.263	0.241
	Predicted dividend/repurchase amounts			
Pre-Covid period (2014-2019)	0.038	0.043	0.060	0.082
Covid – year is 2020	0.038	0.044	0.040	0.064
Covid – year is 2021	0.033	0.036	0.048	0.074
	Test: 2020 versus 2021			
2020 versus 2021	***	*	**	

Note: This table reports marginal effects from pooled Tobit regressions for a sample of 1,048 firms. The sample period is 2014-2021. The dependent variables are dividends paid to common shareholders to net sales and repurchases to net sales, as indicated. Separate regressions are estimated for firms who simultaneously pay dividends and repurchase shares (Div and Rep), pay only dividends (Div-only), or use only share repurchases (Rep-only), as indicated. Firm size is the log of book assets in millions of US$. Leverage is total liabilities to total assets. Profitability is return on assets measured as earnings before interest and taxation to book assets. Profit volatility is the five-year standard deviation of profitability. Firm growth is the one-year growth in book assets. Growth opportunities is market (debt + market capitalization) to book of assets. Cash holdings is cash to assets. We measure firm age using firm incorporation dates. We include but do not report industry dummies. ***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

5. Conclusions

Dividend payments are a consistent source of cash flow to shareholders, making them a reliable mechanism to reduce the agency cost of overinvestment. Oded (2020) suggests that firms use share repurchases to increase payout policy flexibility to avoid underinvestment. In addition, Lee and Rui (2007) reveal that dividends and share repurchases are imperfect substitutes and that share repurchases depend on temporary earnings variation; hence, they are more dependent on

intermittent free cash flows. Thus, share repurchases offer a more flexible way of distributing cash to shareholders. Using data from the Covid-19 period, we test whether firms take advantage of the flexibility offered by share repurchases relative to dividend payouts. We examine the share repurchase flexibility hypothesis when firms perceive that the economy is facing financial constraints such as those experienced during the Covid-19 period.

Our findings are consistent with the view that share repurchases offer more flexibility than dividends do. During the Covid-19 period, we find support for the flexibility hypothesis, as firms are likely to reduce share repurchases when they are cash-constrained but still maintain dividend payouts. However, firms are also likely to trim dividends if they continue to face financial hardships. Our results contribute to the literature on payout policy, documenting the flexibility of share repurchases under financial uncertainty. Our findings are relevant for portfolio managers and practitioners, as they can evaluate the stability of payout policies during periods of financial constraints.

To our knowledge, this is the first study to analyse the flexibility hypothesis of share repurchases in the context of the Covid-19 economic crisis. Some authors have speculated that share repurchases alleviate the agency costs of free cash flows (Lie, 2000; Oswald and Young, 2008). Further tests of the flexibility hypothesis can incorporate potential changes in agency costs when share repurchases decrease. Researchers can consider whether the flexibility of share repurchases varies when the exposure to agency problems is high.

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