Payout Restrictions and Bank Risk-Shifting

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Motivation

US Financial Sector in 2008

- Many banks maintained or increased payouts
- Later required public assistance
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- International scope: Canada, Eurozone, Sweden, UK

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Research Question: How do payout restrictions affect bank equity prices, debt values, and risk-taking decisions in times of crisis?

1. Theoretical model to study impact of payout restrictions
2. Natural experiment to test hypotheses during the pandemic

Hypotheses

1. Impact of payout restrictions on equity prices:
   - **Risk-shifting channel** (Jensen and Meckling, 1976) $\Rightarrow$ equity prices $\downarrow$
   - **Negative news channel** $\Rightarrow$ equity prices $\downarrow$
   - **Stigma channel** $\Rightarrow$ equity prices $\uparrow$
   - **Debt rollover channel** $\Rightarrow$ equity prices $\uparrow$

2. Impact of payout restrictions on debt values:
   - **Risk-shifting channel** (Jensen and Meckling, 1976) $\Rightarrow$ debt values $\uparrow$
   - **Negative news channel** $\Rightarrow$ debt values $\downarrow$

3. Impact of payout restrictions on risk-taking in lending:
   - **Risk-shifting channel** (Jensen and Meckling, 1976) $\Rightarrow$ risk-taking $\downarrow$
   - **Risk management channel** (Froot, Scharfstein and Stein, 1993) $\Rightarrow$ risk-taking $\uparrow$

Findings

Risk-shifting channel

1. Payout restrictions lower bank equity prices

2. Payout restrictions raise bank debt values

Risk-taking effect

3. Payout restrictions affect banks' lending decisions
   - More restricted banks (with higher ex-ante reliance on share buybacks) reduce risk-taking compared to less restricted banks

Both effects revert when payout restrictions are lifted

Literature Review

Banking Regulation (Micro and Macro): Acharya et al (2011), Acharya-Drechsler-Schnabl (2013), Acharya-Le-Shin (2016), Admati et al. (2012), Atkeson et al. (2018), d'Avernas-Bigio (2019), Baron (2020), Begenau (2020), Begenau-Landvoigt (2021), Bergant-Forbes (2021), Berndt-Duffie-Zhu (2020), Brunnermeier-Sannikov (2014, 2016), Corbae-D'Erasmo (2020), Corbae-Levine (2020), Flannery-Hirtle-Kovner (2017), Floyd-Li-Skinner (2015), Gennaioli et al. (2014), Gropp et al. (2019), Hirtle (2014), Kelly-Lustig-van Nieuwerburgh (2016), Sarin-Summers (2016), Smets (2014)

Corporate Finance: Payout Policy, Risk-Shifting and Multi-Tasking: Acemoglu-Kremer-Mian (2008), Damodaran (1989), Handjinicolaou-Kalay (1984), Jensen-Meckling (1976), Kahle-Stulz (2020), Kroen (2021), Ma (2020), Mota (2021)

Banking and Regulatory Response to COVID crisis: Acharya-Engle-Steffen (2020), Ampudia et al. (2023), Chodorow-Reich et al. (2021), Dautovic et al. (2023), Demirguc-Kunt et al. (2020), Greenwald-Krainer-Paul (2021), Haddad-Moreira-Muir (2021), Hardy (2021), Kargar et al. (2020), Marsh (2023), Sanders et al. (2024), Schrimpf-Shin-Sushko (2020), Svoronos-Vrbaski (2020)

Model

Model Setup

Setup (building on Acharya-Le-Shin, 2017)

- One bank living for two periods: $t = 0, 1$
- Franchise value $V > 0$ if solvent at $t = 1$

Assets and Liabilities in place at $t = 0$

- Non-cash assets a due at $t = 1$, $a \sim U(\underline{a}, \overline{a})$, $\underline{a} > 0$
- Cash c and liabilities ℓ due at $t + 1$

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Dividend Decision

- Dividend $d \in [0, c]$ paid at $t = 0$
- Solvency at $t = 1$ requires $a \geq \hat{a}(d)$ where:
  $\hat{a}(d) = \ell + d - c$

Risk-taking Decision

1. $a \sim U(\underline{a}, \overline{a})$
2. $a \sim U(\underline{a} - \epsilon, \overline{a} + \epsilon)$

Model Properties

Property I Payout Restrictions and Equity
- For $V < V^* = \ell - \frac{c}{2} - \underline{a}$, equity value increases in payouts
  $\Rightarrow$ Payout restriction lowers equity value

Property II Payout Restrictions and Debt
- For $V < V^* = \ell - \frac{c}{2} - \underline{a}$, debt value decreases in payouts
  $\Rightarrow$ Payout restriction raises debt value
- A negative news channel ($\bar{a} \downarrow$) would predict lower debt value

Property III Complementarity of payouts and risk-taking
- No restriction: $d = c, a \sim U(\underline{a} - \epsilon, \overline{a} + \epsilon)$
- Payout restriction: $d = 0, a \sim U(\underline{a}, \overline{a})$
- Condition: Intermediate franchise value V and leverage ℓ

Model Details

Empirical Setting

Institutional Setting

CCAR: Largest US banks subject to stress test regime

Jun 25, 2020 16.30 ET - Introduction of Payout Restrictions

- $Div_{it} \leq \min\{Div_{i,t-1}, \bar{\Pi}^t_{i,t-4}\}$ & $BB_{it} = 0$
- Pre-Covid: 2/3 of payouts via share buybacks

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Quantitatively important restrictions

- 2020 Q3 & Q4: Total CCAR bank Tier-1 capital rises by \$73 billion
- Tier-1 capital ratio of median CCAR bank rises by .62 ppt

Data

- Equity Prices: TAQ, CRSP
- CDS and Bond Prices: Markit, TRACE
- FR Y-14 Schedule H1   Summary Stats
  - Loan-level data for universe of CCAR bank loans exceeding $1 million
  - Borrower Characteristics (PD, balance sheet variables)
- Bank Financials: FR Y9C, Compustat   Bank Payouts
  - Focus on 20 domestic CCAR banks

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Domestic CCAR Banks

	Mean	Median	Std
Assets ($ billion)	809	422	933
ROE	9.4	9.5	6.0
Tier-1 Capital Ratio (%)	13.0	12.6	2.1
Buyback/Payout Ratio (17-19 average)	.67	.68	.09

Empirical Strategy

Equity Response

- Use high-frequency data around announcements (at 16.30 EDT)
- Normalize prices to one at 16:00

$$P_{it} = \alpha_i + \alpha_t + \sum_{\substack{\tau=16:00 \\ \tau \neq 16:30}}^{18:00} \beta_\tau \mathbf{1}_{t=\tau} CCARBank_i + \epsilon_{it}$$

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CDS Response

- US \$-denominated CDS on senior unsecured debt
- Daily Event-Study

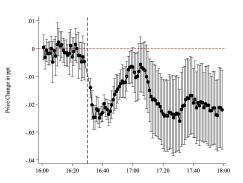$$Spread_{it} = \alpha_{t,r} + \sum_{\substack{\tau=-5 \\ \tau \neq 0}}^{5} \gamma_\tau \mathbf{1}_{t=\tau} CCARBank_i + \delta_1 CCARBank_i + \delta_2 X_{it} + \epsilon_{it}$$

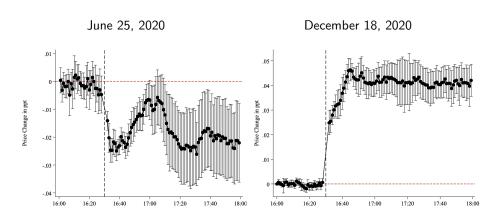# Equity and Debt Responses

Equity Response to Payout Restrictions

- Equity Prices decline upon payout restrictions
  ⇒ Inconsistent with stigma channel or debt rollover channel
- Quantitatively: $26 billion drop in CCAR bank market cap
- Effects persist on days after the announcement: `Jun 25, 2020` `Dec 18, 2020`
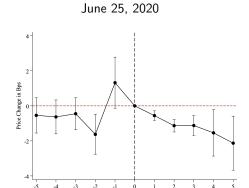
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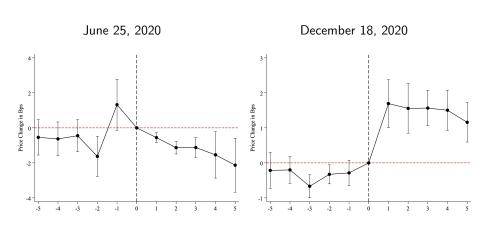

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December 18, 2020

Debt Response to Payout Restrictions

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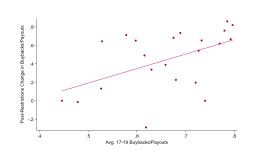 - ⇒ Suggests risk-shifting but not negative news

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December 18, 2020

Payout Restrictions and Risk-Taking

More buyback-dependent banks increased payouts more after restrictions were lifted

- Sort banks by their 2017-19 buyback-to-payout ratio
- Triple DiD to test for effect on bank risk-taking:
  - Focus on new lending over 2020Q1 - 2021Q2
  - 14,819 firm-bank relations

$$log(Loans_{ibstc}) = \alpha_b + \alpha_{s,t} + \alpha_{c,t} + \beta_1 Post_t^{Jun2020} PD_{ibt} Z_i + \beta_2 PD_{ibt} Z_i$$
$$+ \beta_3 Post_t^{Jun2020} Z_i + \beta_4 PD_{ibt} Post_t^{Jun2020} + \gamma_1 Post_t^{Dec2020} PD_{ibt} Z_i +$$
$$\gamma_2 Post_t^{Dec2020} Z_i + \gamma_3 PD_{ibt} Post_t^{Dec2020} + \delta_1 X_{i,t-4} + \delta_2 W_{b,t-1} + \epsilon_{ibstc}$$

More constrained banks adjust risk-taking more

	(1)	(2)	(3)	(4)
Sample				Excluding disposed loans
Dependent variable			log(committed amount)	
PD × IntroPolicy (20Q3-20Q4)	10.285***	10.122***	10.924***	10.960***
	(1.83)	(1.81)	(2.16)	(1.94)
PD × LiftPolicy (21Q1-21Q2)	-21.129***	-18.031***	-16.620**	-14.501***
	(3.68)	(2.55)	(4.35)	(2.52)
PD × Buyback/Payout (17-19)	-6.966**	-9.457**	-8.651*	-10.699**
	(2.71)	(2.85)	(3.49)	(3.59)
PD × IntroPolicy (20Q3-20Q4) × Buyback/Payout (17-19)	-11.890***	-11.562***	-12.717***	-12.711***
	(2.25)	(2.55)	(2.37)	(2.51)
PD × LiftPolicy (21Q1-21Q2) × Buyback/Payout (17-19)	30.354***	26.151***	24.162**	21.181***
	(5.15)	(3.85)	(6.21)	(3.74)
N	14819	14818	14736	14735
R-sqr	0.5139	0.5265	0.5171	0.5288
Bank Controls	x	x	x	x
Firm Controls	x	x	x	x
County × Quarter FE	x	x	x	x
Industry × Quarter FE	x	x	x	x
Bank × Quarter FE		x		x

- Marginal effect for borrower with 1sd higher PD at 1sd more constrained bank:
  - Introduction: 3.8% smaller loan
  - Lifting: 9.7% larger loan

Conclusion

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This Paper

- Study imposing & lifting of payout restrictions on banks

Lessons

1. Payout restrictions redistribute between equity and debtholders
   - With restrictions, equity values fall and debt values rise
   - Higher capital buffers ($73 billion Tier-1 capital)

2. Complementarity of payout policies and risk-taking

Outlook

- Expectations about payout restrictions in next crisis?
- Trade-off: Safer banks vs. excessively cautious banks

Thank you!

Backup

Model Details

Payoff remains convex in $d \implies d = 0$ or $d = c$

	$U(\underline{a}, \bar{a})$	$U(\underline{a} - \epsilon, \bar{a} + \epsilon)$
$d = 0$	$EV(0, safe)$	$EV(0, risky)$
$d = c$	$EV(c, safe)$	$EV(c, risky)$

Conditions for Complementarity:

1. $EV(c, risky)$ is unconstrained optimal choice
2. $EV(0, safe) > EV(0, risky)$

Technically:

1. $\underline{\ell} = \max\{\frac{\bar{a} + \underline{a}}{2}, \underline{a} + c\} < \ell < \frac{\bar{a} + \underline{a}}{2} + c$
2. $\underline{V} < V < \bar{V}$
   - $\bar{V} = \ell - \underline{a} - \frac{c}{2}$
   - $\underline{V} = \frac{\ell^2 - \bar{a}\ell - \underline{a}\ell + \bar{a}\underline{a}}{2\ell - \bar{a} - \underline{a}}$
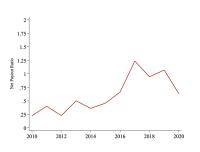
Back

Loan Summary Statistics

- Focus on new loans

  ⇒ Captures only new risk-taking (in constrast to change in loan stocks)
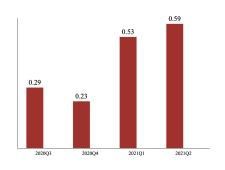
- 2020Q1 - 2021Q2
- Aggregate by firm-bank-quarter level

	N	Mean	Median	Std
Committed Amount (\$ million)	32,196	30.2	4.1	135.3
PD	27,941	.016	.008	.031
Interest Rate	23,806	.030	.029	.015
Firm Assets t-4 (\$ million)	21,978	12922	116	112,038
Firm RoA t-4 (%)	19,049	7.5	5.4	8.2

CCAR Bank Payouts

$$\text{Net Payout Ratio} \quad = \frac{Div_t + BB_t - Iss_t}{Net\ Income_t}$$

Persistence of Equity Results 06/25/2020: CAR Analysis

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t})$$

$$CAR_{it} = \sum_{\tilde{t}=1}^{t} AR_{i,\tilde{t}}$$

Report difference in CAR: CCAR banks versus other banks

CAR after 06/25/2020 Weighted Regression (Banks only)

Date	Coefficient	SE
06/26/2020	-.0135***	(.0050)
06/29/2020	-.0305***	(.0037)
06/30/2020	-.0336***	(.0047)
07/01/2020	-.0351***	(.0047)
07/02/2020	-.0380***	(.0053)
07/06/2020	-.0350***	(.0066)
07/07/2020	-.0423***	(.0073)
07/08/2020	-.0423***	(.0090)
07/09/2020	-.0422***	(.0099)
07/10/2020	-.0211**	(.0087)

Table reports coefficients from daily regressions for the 10 days after the announcement date
following 06/25/2020. Each daily regression regresses cumulative abnormal returns up to that

Persistence of Equity Results 12/18/2020: CAR Analysis

CAR after 12/18/2020 Weighted Regression (Banks Only)

Date	Coefficient	SE
12/21/2020	.03196***	(.0049)
12/22/2020	.01844***	(.0047)
12/23/2020	.02493***	(.0055)
12/24/2020	.02299***	(.0051)
12/28/2020	.02279***	(.0053)
12/29/2020	.02646***	(.0055)
12/30/2020	.02332***	(.0054)
12/31/2020	.02873***	(.0053)
01/04/2021	.02893***	(.0067)
01/05/2021	.02701***	(.0072)

Table reports coefficients from daily regressions for the 10 days after the announcement date following 12/18/2020. Each daily regression regresses cumulative abnormal returns up to that day onto an indicator for the CCAR banks. Sample includes only banks with market capitalization exceeding USD 1 billion (SIC 6020, 6021, 6022, 6029, 6081, 6141, 6163, 6211, 6711, 6712) and regressions are weighted by market value. Source: CRSP and own calculations.