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CYBERSECURITY RISK AND PAYOUT POLICY

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INTRODUCTION

In an increasingly interconnected and digitalized world, cybersecurity has emerged as a critical concern for businesses, governments, and individuals alike. The World Economic Forum has recognized it as “the most immediate and financially material sustainability risk that firms face today.” Despite its relevance, the impact of cybersecurity risk on corporate payout policy remains largely unexplored. This study addresses that gap using a Heckman two-step model to assess how cybersecurity risk influences both the magnitude and propensity of payouts.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

Transition between dividend and buyback preferences:

- There is an increasing substitution effect of share repurchases for dividends (*Grullon & Michaely, 2002*).
- Share repurchases have grown substantially and now constitute a major component of corporate payout policies (*Weigand & Baker, 2009*).
- Share repurchases reached record levels of nearly \$1 trillion in 2018, surpassing dividends as firms’ preferred method of payout. Firms often use these payout methods in a complementary rather than directly substitutive manner (*Bonaimé & Kahle, 2024*).

The impact of cyberattacks on stock prices and its implication

- Successful cyberattacks have negative impact on stock prices (*Kamiya et al., 2021*).
- Affected firms experience a drop in daily excess returns and a substantial increase in trading volume, interestingly liquidity improves during such events as reflected by narrower bid-ask spreads (*Tosun, 2021*).
- Positive relationship between cybersecurity and cash reserves, rising from 23% to 26.9% of assets (*Garg, 2019*).

The impact of cyberattacks on reputation and its implication

- Data breaches significantly lower a firm’s equity and brand value (*Akey et al., 2021*).
- Severe reputational damage (*Leroy, 2022*).

Industries that are more or less susceptible to cyberattacks

- Larger firms operating in less competitive industries are more prone to experiencing cyberattacks (*Kamiya et al., 2021*).
- Socially responsible companies are less likely to be targeted by hackers and vice versa (*Lending et al., 2018*).
- Firm’s socially responsible behavior serve as a form of insurance protection against external shocks such as data breaches (*Bamiatzi et al., 2023*).

HYPOTHESES DEVELOPMENT

Cyber risk and dividend payout. Higher cybersecurity risk leads to a decrease in dividend payouts.

Cyber risk and share repurchase. Higher cybersecurity risk leads to an increase in share repurchases.

Cyber risk and total payout. Higher cybersecurity risk leads to a no change in total payouts.

(*Perera et al., 2023*).

Based on these prior studies we propose the following hypotheses:

H 1a. Higher cybersecurity risk leads to a reduction in dividend payouts.

H 1b. Higher cybersecurity risk leads to an increase in share repurchases.

H 1c. Higher cybersecurity risk leads to a no significant change in total payouts.

EMPIRICAL ANALYSIS

Sample: 1,241 U.S. public companies

Period: 2011-2018

Model: Heckman two-step selection model (addresses sample selection bias that OLS models cannot correct). Firms that pay dividends differ systematically from those that do not; analyzing only payers risks self-selection bias (*Cheung et al., 2016*).

We estimate two equations:

1st Selection equation: Models the firm’s propensity to pay dividends or repurchase share. Includes standard controls plus selection variables recommended by *Banyi & Kahle (2014)*:

- **For DIV/A and PAYOUT/A:** *ipo90, reta_ipo90*
- **For REP/A and REP/PAYOUT:** *ipo90 only*

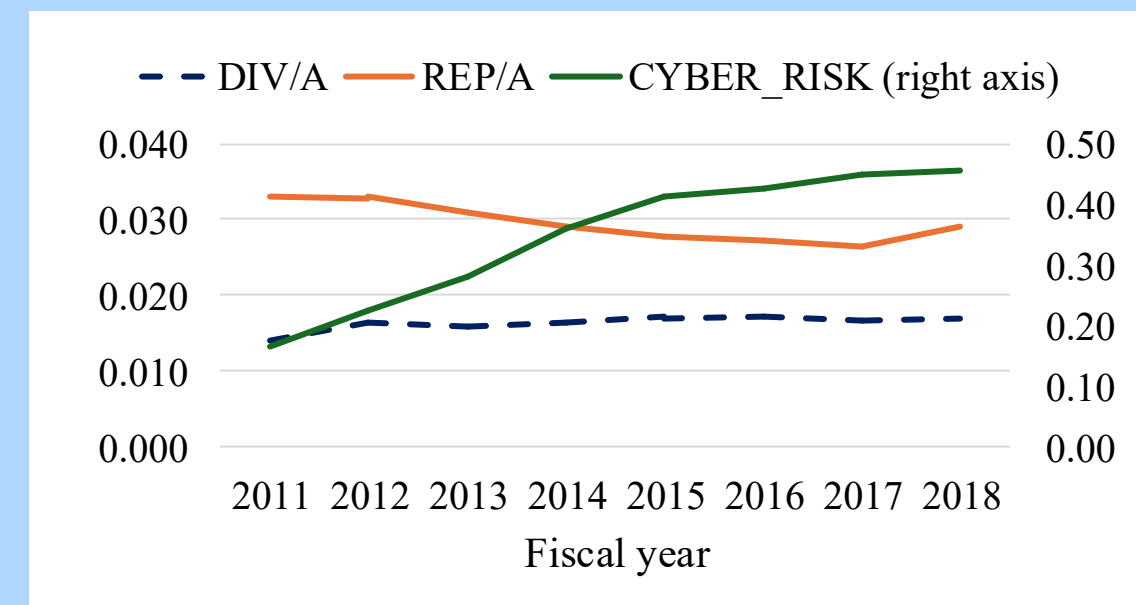
2nd Outcome equation: Estimates the level of payouts, correcting for selection bias using the Inverse Mills Ratio from the first stage. We follow the variable set used by *Perera et al. (2023)*, excluding R&D (null across all observations in our dataset).

- **Dependent variables (for firm *i* in year *t*+1):** *DIV/A, REP/A, PAYOUT/A, REP/PAYOUT*

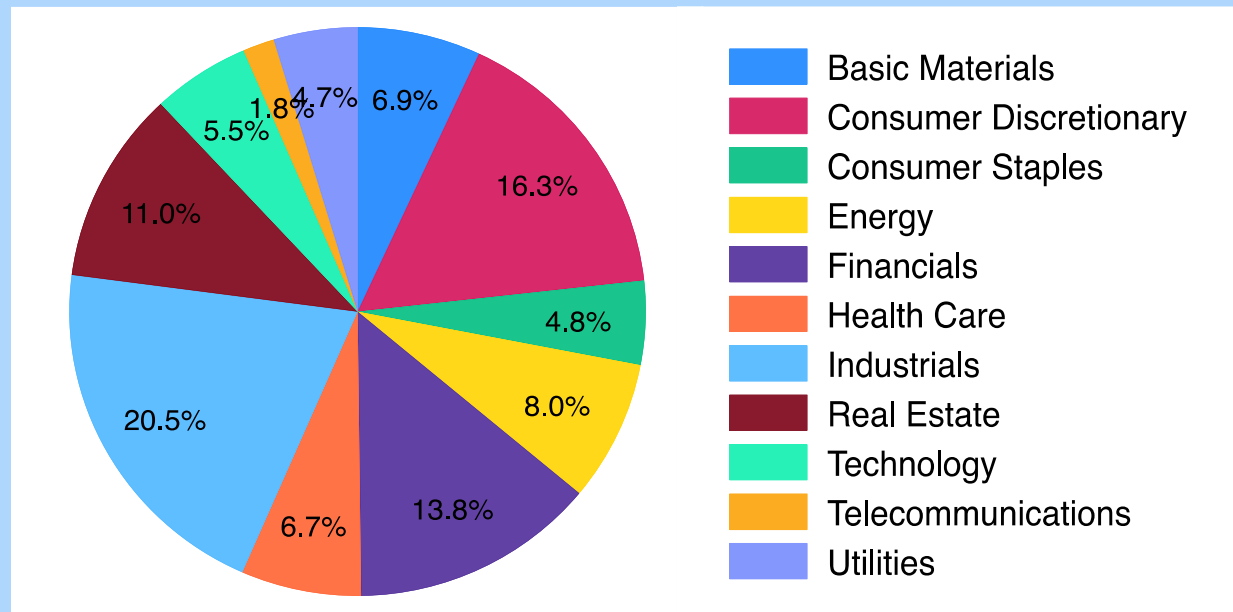
A dummy variable is constructed for each case (1 = firm pays in year *t*+1, 0 = otherwise) and used as the dependent variable in first stage.

- **Key independent variable (for firm *i* in year *t*):** *CYBER_RISK*
- **Control Variables (for firm *i* in year *t*):** *MB, ROA, DEBT/A, CASH/A, ln(A), RE/A, PPE/A, CAPEX/A, RET/VOL*
 - Selection equation controls (for firm *i* in year *t*): *ipo90, reta_ipo90*

The evolution of mean dividends-to-assets (DIV/A), share repurchases-to-assets (REP/A) and cyber risk measure (CYBER_RISK): Years 2011-2018.



The distribution of the firms by the industry: Years 2011-2018.



RESULTS

DIV/A: negative and significant for both amount and propensity to pay dividends.

REP/A: insignificant for both amount and propensity to repurchase.

PAYOUT/A: : insignificant for both amount and propensity to pay.

REP/PAYOUT: insignificant for both amount and propensity to increase repurchase-to-total payout.

Robustness checks

✔ **Excluding financial firms:** confirms for DIV/A, PAYOUT/A and REP/PAYOUT.

✔ **Dependent variables at t+2:** REP/A gains significance and the propensity to increase REP/PAYOUT too.

! **Adding year & industry fixed effects: omitted variable bias problem.**

- **DIV/A:** amount loses significance, propensity remains significant (at 5%). (==)
- **REP/A:** amount becomes significant (at 10%). (++)
- **PAYOUT/A and REP/PAYOUT** remains insignificant for both amount and propensity.

CONCLUSIONS

Empirical evidence suggests that:

- Cybersecurity risk is negatively associated with the propensity to pay dividends, though it does not significantly influence the amount paid.
- Cybersecurity risk is positively associated with the amount of share repurchases, though it does not significantly influence the propensity to repurchase.
- Cybersecurity risk is not associated with total payouts.

Future research should:

- Include more determinants of DIV/A in the selection equation.
- Include more determinants of REP/A in the selection equation.