# The Game Changer:
# Regulatory Reform and Multiple Credit Ratings

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# Background

- Credit ratings issued by credit rating agencies (CRAs) are widely used by investors and financial institutions in assessing firms' creditworthiness and determining regulatory capital requirements.

- A substantial number of unanticipated credit rating downgrades of corporations and structured securities in 2008 and 2009 have raised concerns about the objectivity and quality of ratings.

- In 2010 U.S. Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank):
  - Increased legal and regulatory penalties for issuing inaccurate ratings (Section 932 & 933)
  - Eliminated all references to the role of credit ratings in regulatory requirements and capital adequacy ratios (Section 939)
- › **We examine the impact of Dodd-Frank on multiple credit ratings.**

# Motivation

- When bonds are rated by two CRAs, the lower rating is used for bond classification.

- When bonds are rated by more than two CRAs, the second lowest rating is used to classify this bond (Lehman Brothers index rule change 2005)
  - The Lehman index rule change increased the demand for third ratings (Chen and Wang, 2017)

- Presents firms with a free option to improve their current rating as a third rating (i.e., generally provided by Fitch) cannot worsen the credit quality of the issuer
  - Fitch provides more optimistic ratings on average
  - Significant incentives for firms to get an additional rating from Fitch when Moody's and S&P ratings are on opposite sides of the HY-IG boundary (Bongaerts et al., 2012)

› **However, the regulatory reforms enacted by Dodd-Frank changed the 'credit ratings game'.**

# Hypotheses

- Studies show that multiple ratings are primarily motivated by regulation
  - Opp et al. (2013), Cornaggia et al. (2016), Bongaerts et al. (2012), Chen and Wang (2017)

- Reduced regulatory reliance on credit ratings reduces the regulatory advantage of higher ratings.

- *$H_1$: The prevalence of firms seeking third ratings has declined post-Dodd-Frank.*

# Hypotheses

- Ratings inflation should be most valuable for firms near the HY-IG threshold

    - CRAs had particularly strong incentives to inflate ratings around the boundary (Behr et al., 2016; Cornaggia et al., 2016)
    - HY-rated issues should have a greater demand for third ratings compared to IG-rated issues because Fitch serves as a tiebreaker to upgrade bond issues from HY to IG classification (Bongaerts et al., 2012)

- **$H_2$**: *The decline in the demand for third ratings is more pronounced for firms with HY ratings near the HY-IG boundary.*

# Hypotheses

- Credit ratings have long been shown to have significant information content for market participants
  - A third rating provided by Fitch brings additional information to investors and reduces the yield premium on information-opaque bonds by about 30%, or 15 bps (Livingston and Zhou, 2016)

- Since the increased penalties on false ratings and the removal of the reliance on credit ratings enacted by Dodd-Frank may lead to less optimistic ratings and remove the advantage of higher ratings, we posit that Dodd-Frank has reduced the information content of third ratings
  - Post Dodd-Frank CRAs issue lower credit ratings that elicit weaker stock and bond market reactions (Dimitrov et al., 2015)

- *$H_3$: The market reaction to a third rating from Fitch has significantly weakened around the HY-IG boundary.*

# Data

- Bond characteristics and credit ratings by Moody's, S&P and Fitch are acquired from the Mergent Fixed Income Securities Database (FISD). Ratings are converted to numerical rating codes, from 1 to 21 (AAA to C).

- Firms' accounting data from Compustat Annual File and equity analyst data from IBES.

- We restrict our sample to senior unsecured newly issued U.S. domestic corporate debentures rated by both Moody's and S&P. We focus on initial ratings as the process for assigning initial ratings is more robust than the process for monitoring ratings (Chen and Wang, 2017).

- We follow Livingston et al. (2007) and filter out additional bond issues of the same issuing firm within the same month. The final sample contains 1,283 bond issues from 2006 to 2015.

# Methodology

- Probit model
  - Dependent variable: *Fitch*, an indicator variable equals one if the bond has a Fitch rating, and zero otherwise
  - Main variable: *Dodd-Frank*, an indicator variable equals one if firm's bond is issued after Dodd-Frank (i.e., 21 July 2010), and zero otherwise
  - Main variable: *Distance*, the absolute distance from the HY-IG boundary

- Controls for firm characteristics
  - Firm size, market-to-book ratio, intangible assets, leverage, profitability, tangibility, rating dispersion, dispersion in equity analysts' earnings forecasts, and the number of analysts following a firm
  - All continuous firm-level variables are winsorized at the 1% level in both tails of the distribution

- Includes industry and year fixed effects

# Figure

› Proportion of Newly Issued Bonds Rated by Fitch
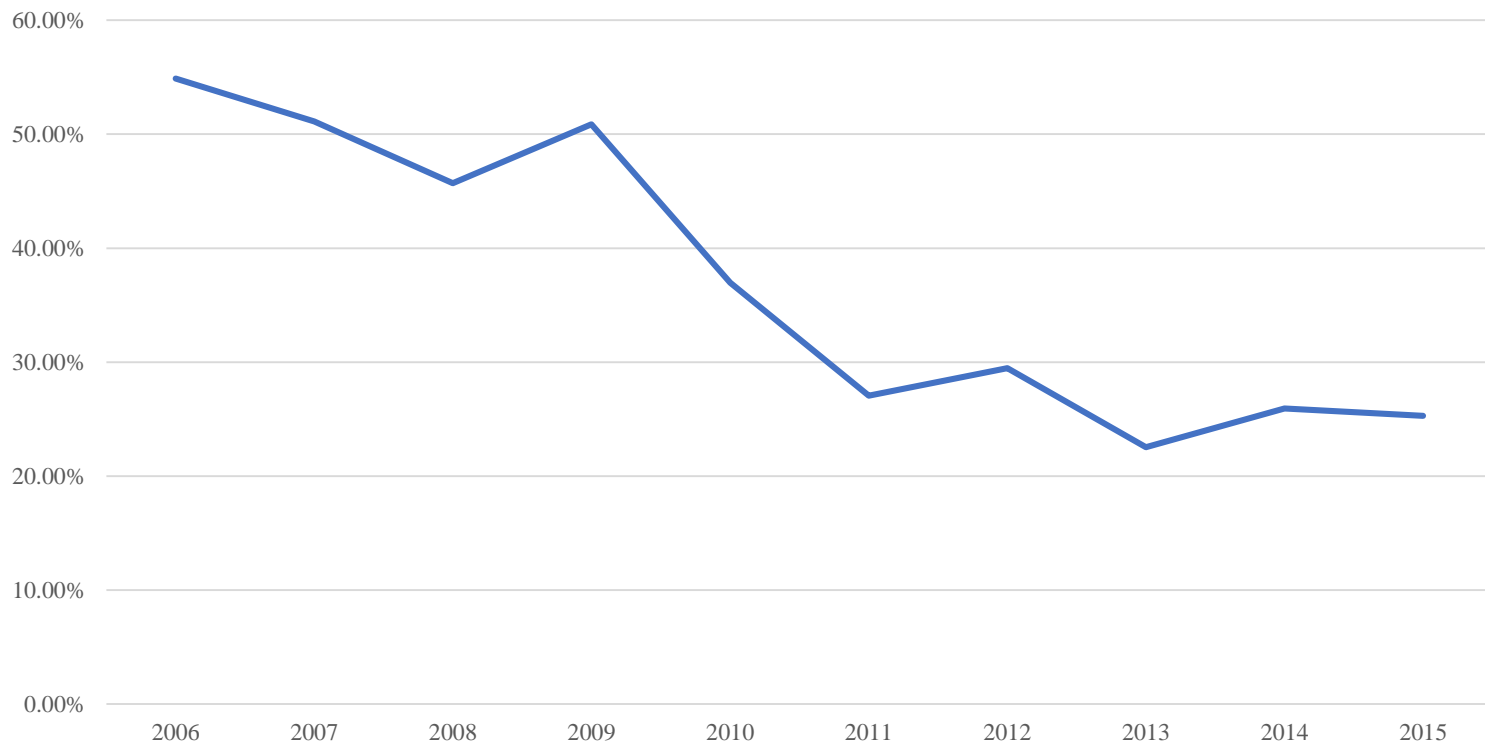
# Descriptive Statistics

› Descriptive Statistics for Control Variables Affecting Fitch Demand

| Panel A | Before Dodd-Frank (560 obs) | | | | | After Dodd-Frank (723 obs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Min | Max | Std | Mean | Median | Min | Max | Std |
| Firm Size | 10.320 | 10.136 | 6.538 | 13.752 | 1.966 | 10.185 | 9.871 | 6.538 | 13.752 | 1.871 |
| Market to Book | 1.532 | 1.331 | 0.892 | 4.015 | 0.616 | 1.533 | 1.348 | 0.892 | 4.015 | 0.632 |
| Intangible Assets | 0.173 | 0.116 | 0 | 0.720 | 0.187 | 0.182 | 0.115 | 0 | 0.720 | 0.198 |
| Leverage | 0.272 | 0.241 | 0.012 | 0.711 | 0.155 | 0.280 | 0.252 | 0.012 | 0.711 | 0.147 |
| Profitability | 0.042 | 0.032 | -0.225 | 0.209 | 0.060 | 0.039 | 0.035 | -0.225 | 0.209 | 0.064 |
| PPE | 0.468 | 0.336 | 0 | 1.761 | 0.428 | 0.529 | 0.414 | 0 | 1.761 | 0.462 |
| Analyst Coverage | 19.346 | 19 | 3 | 43 | 8.337 | 24.089 | 24 | 3 | 62 | 10.982 |
| Stdev of Forecasts | 0.0453 | 0.004 | 0.000 | 1.436 | 0.217 | 0.011 | 0.004 | 0 | 0.686 | 0.034 |
| S&P Ratings | 6.991 | 7 | 1 | 17 | 3.761 | 9.184 | 9 | 1 | 18 | 3.222 |
| Moody's Ratings | 7.186 | 7 | 1 | 18 | 3.806 | 9.509 | 9 | 1 | 19 | 3.343 |

| Panel B | Mean | | | Median | | |
|---|---|---|---|---|---|---|
| | Whole Sample | Without Fitch | With Fitch | Whole Sample | Without Fitch | With Fitch |
| Firm Size | 10.244 | 10.202 | 10.303 | 9.982 | 9.749 | 10.232 |
| Market to Book | 1.532 | 1.515 | 1.557 | 1.341 | 1.303 | 1.359 |
| Intangible Assets | 0.178 | 0.172 | 0.188 | 0.116 | 0.099 | 0.131 |
| Leverage | 0.276 | 0.292 | 0.254 | 0.249 | 0.259 | 0.235 |
| Profitability | 0.040 | 0.035 | 0.048 | 0.034 | 0.027 | 0.045 |
| PPE | 0.502 | 0.488 | 0.523 | 0.370 | 0.328 | 0.427 |
| Analyst Coverage | 22.019 | 21.584 | 22.636 | 21 | 20 | 22 |
| Stdev of Forecasts | 0.026 | 0.032 | 0.017 | 0.004 | 0.0046 | 0.003 |
| Rating Dispersion | 0.675 | 0.704 | 0.634 | 1 | 1 | 0 |
| S&P Ratings | 8.227 | 8.468 | 7.885 | 8 | 8 | 8 |
| Moody's Ratings | 8.495 | 8.773 | 8.1 | 8 | 9 | 8 |
| Number of Observations | 1283 | 753 | 530 | 1283 | 753 | 530 |

# Regression Results

- Fitch Demand: Probit Regressions with Interaction between Distance and Dodd-Frank

| VARIABLES | (1)<br>Full Sample<br>Probit | (2)<br>Pre-DFA<br>Probit | (3)<br>Post-DFA<br>Probit |
|---|---|---|---|
| Distance*Dodd-Frank | 0.106** | | |
| | (2.022) | | |
| Distance | -0.196*** | -0.242*** | -0.094*** |
| | (-4.484) | (-5.112) | (-2.597) |
| Dodd-Frank | -0.491** | | |
| | (-2.071) | | |
| Firm Size | 0.200*** | 0.222** | 0.245*** |
| | (3.251) | (2.474) | (3.262) |
| Intangibles | -0.541 | -0.802 | -0.465 |
| | (-1.184) | (-1.296) | (-0.885) |
| Market to Book | -0.052 | -0.203 | 0.032 |
| | (-0.403) | (-1.020) | (0.230) |
| Leverage | -0.772 | -0.608 | -0.703 |
| | (-1.517) | (-0.854) | (-1.148) |
| Profitability | 0.048 | 3.017* | -1.501 |
| | (0.043) | (1.706) | (-1.197) |
| PPE | 0.388 | 0.120 | 0.490 |
| | (1.318) | (0.302) | (1.486) |
| Analyst Coverage | -0.005 | 0.021 | -0.018* |
| | (-0.577) | (1.558) | (-1.943) |
| Analyst Forecast Dispersion | 0.336 | 0.328 | 0.022 |
| | (0.806) | (0.757) | (0.017) |
| Rating Dispersion | -0.121 | -0.071 | -0.147 |
| | (-1.528) | (-0.613) | (-1.594) |
| Constant | -1.245* | -1.892* | -2.251*** |
| | (-1.851) | (-1.945) | (-2.901) |
| | | | |
| Industry FEs | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes |
| Observations | 1,283 | 560 | 723 |
| Pseudo R-squared | 0.144 | 0.214 | 0.121 |

# Robustness Tests

- Placebo tests
  - Assigns fictitious event dates pre/post Dodd-Frank
  - Utilizes a dynamic analysis framework by creating indicator variables indicating a year prior to Dodd-Frank, the year of Dodd-Frank and a year and beyond Dodd-Frank

- Other channels (i.e., rule out other explanations)
  - Fitch is more reluctant to inflate due to liability issues?
  - Due to increased efforts in investor screening?

# Regression Results

- Placebo Tests: Probit Regressions with Interaction between Distance and Dodd-Frank

- Column 1 (2) assigns fictitious event date of 1st Jan 2008 (1st Jan 2014) and utilizes a subsample with a 4-year window (i.e., 2 years before and 2 years after the fictitious event date).

| VARIABLES | (1) Dodd-Frank_2008 Probit | (2) Dodd-Frank_2014 Probit |
|---|---|---|
| Distance*Dodd-Frank | -0.001 | -0.012 |
| | (-0.022) | (-0.138) |
| Distance | -0.267*** | -0.071 |
| | (-4.313) | (-1.511) |
| Dodd-Frank | 0.015 | -0.457 |
| | (0.051) | (-1.521) |
| Firm Size | 0.215** | 0.168** |
| | (2.264) | (2.026) |
| Intangibles | -0.774 | -0.384 |
| | (-1.209) | (-0.706) |
| Market to Book | -0.203 | -0.028 |
| | (-0.950) | (-0.172) |
| Leverage | -0.530 | -0.574 |
| | (-0.710) | (-0.867) |
| Profitability | 3.879** | -0.820 |
| | (2.068) | (-0.627) |
| PPE | 0.200 | 0.614* |
| | (0.487) | (1.779) |
| Analyst Coverage | 0.021 | -0.016 |
| | (1.463) | (-1.491) |
| Analyst Forecast Dispersion | 0.347 | -1.001 |
| | (0.733) | (-0.641) |
| Rating Dispersion | -0.151 | -0.198* |
| | (-1.187) | (-1.936) |
| Constant | -1.941* | -1.694* |
| | (-1.911) | (-1.920) |
| | | |
| Industry FEs | Yes | Yes |
| Year FEs | Yes | Yes |
| Observations | 492 | 469 |
| Pseudo R-squared | 0.224 | 0.109 |

# Regression Results

- Dynamic Analysis: Probit Regressions with Interaction between Distance and Dodd-Frank

- Indicator variables *Dodd-Frank_2009*, *Dodd-Frank*, and *Dodd-Frank_2011* indicate a year prior to Dodd-Frank, the year of Dodd-Frank, and a year and beyond Dodd-Frank, respectively.

| VARIABLES | (1) Full Sample Probit |
|---|---|
| Distance*Dodd-Frank_2009 | 0.049 |
| | (0.853) |
| Distance*Dodd-Frank | 0.139** |
| | (2.174) |
| Distance*Dodd-Frank_2011 | 0.143** |
| | (2.333) |
| Dodd-Frank_2009 | -0.288 |
| | (-1.014) |
| Dodd-Frank | -0.802*** |
| | (-2.773) |
| Dodd-Frank_2011 | -1.470*** |
| | (-4.104) |
| Distance | -0.229*** |
| | (-4.623) |
| Firm Size | 0.207*** |
| | (3.373) |
| Intangibles | -0.527 |
| | (-1.152) |
| Market to Book | -0.038 |
| | (-0.294) |
| Leverage | -0.735 |
| | (-1.435) |
| Profitability | -0.061 |
| | (-0.055) |
| PPE | 0.377 |
| | (1.268) |
| Analyst Coverage | -0.006 |
| | (-0.695) |
| Analyst Forecast Dispersion | 0.406 |
| | (0.983) |
| Rating Dispersion | -0.131 |
| | (-1.643) |
| Constant | -1.149* |
| | (-1.711) |
| | |
| Industry FEs | Yes |
| Year FEs | Yes |
| Observations | 1,283 |
| Pseudo R-squared | 0.146 |

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# Regression Results

- ## Other Channels: Probit Regressions with Triple Interactions

- *Proxy* represents proxies for litigation risk (i.e., litigation industry, stock volatility and sales growth in Column 1-3, respectively), and proxies for investor screening efforts (i.e., CSR scores, blockholder ownership and activist shareholder in Column 4-6, respectively).

| | Litigation Risk | | | Increased Investor Screening | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Litigation Industry | Stockvol | Sales Growth | CSR Score | Blockholder Ownership | Activist Shareholder |
| VARIABLES | Probit | Probit | Probit | Probit | Probit | Probit |
| Proxy*Dodd-Frank*Distance | -0.143 | 3.024 | -0.060 | 0.002 | 0.176 | -0.009 |
| | (-1.261) | (0.743) | (-0.230) | (0.170) | (0.478) | (-0.156) |
| Proxy | -0.629* | -6.099 | -0.879 | 0.064 | 0.039 | 0.438** |
| | (-1.737) | (-0.700) | (-1.201) | (1.272) | (0.036) | (2.425) |
| Proxy*Dodd-Frank | 0.319 | -14.628 | -0.005 | -0.052 | 0.624 | -0.411** |
| | (0.786) | (-0.829) | (-0.005) | (-0.986) | (0.477) | (-2.082) |
| Proxy*Distance | 0.280*** | -0.227 | 0.110 | -0.008 | -0.127 | -0.043 |
| | (3.051) | (-0.181) | (0.583) | (-0.763) | (-0.402) | (-0.954) |
| Dodd-Frank | -0.428* | -0.230 | -0.485** | -0.607** | -0.391 | 0.320 |
| | (-1.703) | (-0.586) | (-1.966) | (-2.114) | (-1.175) | (0.701) |
| Distance | -0.236*** | -0.187*** | -0.200*** | -0.229*** | -0.173** | -0.102 |
| | (-4.876) | (-3.271) | (-4.561) | (-4.643) | (-2.186) | (-0.949) |
| Distance*Dodd-Frank | 0.107* | 0.050 | 0.110** | 0.155** | 0.017 | 0.084 |
| | (1.734) | (0.530) | (1.987) | (2.445) | (0.182) | (0.712) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1,283 | 1,280 | 1,282 | 964 | 1,045 | 1,251 |
| Pseudo R-squared | 0.154 | 0.145 | 0.149 | 0.148 | 0.170 | 0.154 |

# Regression Results

- Fitch Demand: Firms near HY/IG Boundary

- Model 1 reports the results with *BorderIG*, which is the absolute notch value to the IG boundary (BBB-) for bonds with IG ratings, while Model 2 reports the results with *BorderHY*, which is the absolute notch value to the IG boundary (BBB-) for bonds with HY ratings. Model 3 reports the results with both *BorderIG* and *BorderHY*.

| VARIABLES | Model 1 Probit | Model 2 Probit | Model 3 Probit |
|---|---|---|---|
| Dodd-Frank | -0.308 | -0.321 | -0.536** |
| | (-1.486) | (-1.463) | (-2.251) |
| BorderIG | -0.139*** | | -0.177*** |
| | (-2.758) | | (-3.411) |
| BorderIG*Dodd-Frank | 0.038 | | 0.091 |
| | (0.695) | | (1.518) |
| BorderHY | | -0.224*** | -0.293*** |
| | | (-4.044) | (-4.827) |
| BorderHY*Dodd-Frank | | 0.117** | 0.200*** |
| | | (2.208) | (3.215) |
| Firm Size | 0.214*** | 0.034 | 0.175** |
| | (3.082) | (0.464) | (2.421) |
| Intangibles | -0.341 | -0.501 | -0.561 |
| | (-0.757) | (-1.087) | (-1.224) |
| Market to Book | -0.012 | -0.248* | -0.090 |
| | (-0.087) | (-1.842) | (-0.655) |
| Leverage | -1.333*** | -0.885 | -0.715 |
| | (-2.723) | (-1.613) | (-1.342) |
| Profitability | 0.441 | -0.115 | -0.059 |
| | (0.399) | (-0.104) | (-0.053) |
| PPE | 0.429 | 0.427 | 0.388 |
| | (1.444) | (1.428) | (1.313) |
| Analyst Coverage | -0.001 | 0.001 | -0.004 |
| | (-0.089) | (0.141) | (-0.517) |
| Analyst Forecast Dispersion | 0.281 | -0.048 | 0.284 |
| | (0.651) | (-0.113) | (0.666) |
| Rating Dispersion | -0.165** | -0.047 | -0.098 |
| | (-2.034) | (-0.585) | (-1.187) |
| Constant | -1.828** | -0.182 | -0.984 |
| | (-2.476) | (-0.231) | (-1.248) |
| Industry FEs | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes |
| Observations | 1,283 | 1,283 | 1,283 |
| Pseudo R-squared | 0.126 | 0.127 | 0.147 |

*H$_2$: The decline in the demand for third ratings is more pronounced for firms with HY ratings near the HY-IG boundary.*

# Yield Regression

- OLS Regression of Credit Spreads
  - Dependent variable: *Credit Spread*, the difference between the yield of the benchmark treasury issue and the issue's offering yield expressed in basis points
  - *Fitch_Makes_IG*, an indicator variable that equals one if Moody's and S&P are at the boundary and Fitch added and Fitch pulls IG, and zero otherwise
  - *Fitch_Added_Better*, an indicator variable that equals one if Fitch is added and overall rating level is improved, and zero otherwise
  - *Fitch_Added_Equal*, an indicator variable that equals one if Fitch is added and overall rating level is unchanged (i.e., Fitch cannot worsen the overall rating level), and zero otherwise
  - *InvBoundary*, an indicator variable that equals one if Moody's and S&P are at the HY-IG boundary, and zero otherwise
  - Controls for firm and bond characteristics, and industry and year fixed effects

# Regression Results

- OLS Regression of Credit Spreads

| VARIABLES | Model 1 Credit Spread |
|---|---|
| Fitch_Makes_IG*Dodd-Frank | 72.834** |
| | (2.051) |
| Fitch_Makes_IG | -133.606*** |
| | (-3.617) |
| Dodd-Frank | 0.861 |
| | (0.055) |
| Fitch_Added_Better | -8.535 |
| | (-0.854) |
| Fitch_Added_Equal | -0.515 |
| | (-0.057) |
| Fitch_Added_Better*Dodd-Frank | -18.060 |
| | (-1.380) |
| Fitch_Added_Equal*Dodd-Frank | -7.595 |
| | (-0.645) |
| InvBoundary | 83.269*** |
| | (3.773) |
| Firm Size | -7.833** |
| | (-2.391) |
| Market to Book | -28.200*** |
| | (-4.312) |
| Intangible Assets | -75.934*** |
| | (-3.944) |
| Analyst Coverage | -1.115*** |
| | (-3.044) |
| Issue Size | -1.582 |
| | (-0.859) |
| Maturity | 13.310*** |
| | (5.391) |
| S&P Rating | 28.409*** |
| | (17.313) |
| CDX Index | 1.772*** |
| | (15.656) |
| Callable | 13.619* |
| | (1.912) |
| Rule144a | 88.329*** |
| | (7.088) |
| Constant | -42.385 |
| | (-0.822) |
| Industry FEs | Yes |
| Year FEs | Yes |
| Observations | 2,221 |
| R-squared | 0.796 |

$H_3$: *The market reaction to a third rating from Fitch has significantly weakened around the HY-IG boundary*

# Conclusion

- The Dodd-Frank reform enacted in response to the mayhem of the 2008 GFC introduced several important reforms to the credit rating industry.

- We present evidence that these changes materially impacted the activities of the credit rating industry, especially in the provision of multiple credit ratings
  - Firms are **less likely** to seek a third rating for new corporate bond issues following the implementation of Dodd-Frank. The results are **more pronounced** for bonds with ratings near the HY-IG boundary
  - Third rating assessments (typically provided by Fitch), have become **less informative** with a diminished impact on credit spreads post Dodd-Frank when firms with current Moody's and S&P ratings are on opposite sides of the HY-IG boundary

- Our research provides an important first step in linking the recent regulatory reforms to changes in the 'credit ratings game' and the real effects on firms' economic activities from increased financing costs.

# Thank You

# Q & A

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# Appendix

- Industry Distribution

This table presents the industry distribution of the sample before and after Dodd-Frank. Panel A is based on the Mergent industry code while Panel B is based on the GICS classification.

| Panel A | Before Dodd-Frank | | After Dodd-Frank | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Industrial | 359 | 64.11% | 488 | 67.50% |
| Finance | 137 | 24.46% | 166 | 22.96% |
| Utility | 28 | 5.00% | 59 | 8.16% |
| Government | 36 | 6.43% | 10 | 1.38% |
| Total | 560 | 100% | 723 | 100% |

| Panel B | Before Dodd-Frank | | After Dodd-Frank | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Energy | 61 | 10.89% | 109 | 15.08% |
| Materials | 49 | 8.75% | 56 | 7.75% |
| Industrials | 99 | 17.68% | 64 | 8.85% |
| Consumer Discretionary | 52 | 9.29% | 87 | 12.03% |
| Consumer Staples | 51 | 9.11% | 48 | 6.64% |
| Health Care | 60 | 10.71% | 75 | 10.37% |
| Financials | 126 | 22.50% | 149 | 20.61% |
| IT | 23 | 4.11% | 53 | 7.33% |
| Telecommunication | 13 | 2.32% | 29 | 4.01% |
| Utilities | 24 | 4.29% | 47 | 6.50% |
| Real Estate | 2 | 0.36% | 6 | 0.83% |
| Total | 560 | 100% | 723 | 100% |