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Week 3: Finance Career (HL)

Célérier, C., & Vallée, B. (2019). Returns to talent and the finance wage premium. The Review of Financial Studies, 32(10), 4005-4040.

Research Question(s):

- Is there a wage premium for talent in the finance industry?

Summary of Findings:

- The finance wage premium is associated with higher returns to talent in finance (3x higher than the rest of the economy)
  - Control for fixed effects as well as individual effects.
- Returns to talent reflect high complimentary between talent and scale.
  - Macro: Returns to talent increased significantly faster in finance than other industries, linked to capital per employee within the industry
  - Micro: More talented individuals matched with larger projects, with elasticity to size in finance larger than other industries.
- Report three stylized facts
  - Gap in returns to talent (finance vs rest of economy) increases with worker experience
  - Gap larger for jobs requiring general skills than for technical. Former provide industry specific skills rather than job specific ones.
  - As worker project size increased, attracts larger share of talented workers given higher returns to talent, forfeiting skills from other industries.
- Performance-pay used for employee retention with evidence of a brain drain towards finance.
- Consider ensemble of alternative which do not have explanatory power.

Summary of Tables:

- **Figure 1:** Summarises selection process for university considering course contributions from preparatory to national competitive exams, to final rankings. Lead to final selection rates, with Ecole Polytechnique the most competitive at 1.5%.
- **Table 1:** Sample statistics from engineering graduates with wage and industry demographics listed.
- Growth in number of engineers in finance and consulting, with top 99th percentile wages increasing throughout years.
- **Table 2:** Measures talent considering selection rate, number of citations using an OLS regression, and Wage round share. As expected, top selection rate (<2%) has highest number of citations (windsored OLS on Google Scholar) and wage share.
- **Table 3:** Reports wage premium using equation below

$$\ln(w_{n,t}) = \eta_{-f} Talent_n + (\eta_f - \eta_{-f}) Talent_n \times \mathbb{1}_{Finance_{n,t}}$$

$$+ \beta \mathbb{1}_{Finance_{n,t}} + \lambda X_n + \mu D_t + \lambda_{j,t}.^{18}$$

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  - Talent is (1-selection rate)
  - IV variables are 1Finance (Working in finance with two-year market return) in first stage and second stage regressions (Talent X Working in Finance X Two year market return)
  - R-squared measures increases in OLS marginally as more factors considered.
  - Panel regressions explain abnormally large number of variation.
- **Figure 2:** Finance wage premium dramatically increase in 2000 for 90th Percentile.
- **Figure 3:** School selection rate vs wage premium over less selected schools. Finance for <2% way higher than rest of economy (Grey area 90% confidence intervals, including fixed effects, experience levels etc.
- **Figure 4:** Blinder-Oaxaca Decomposition of the difference in log of yearly gross wage between finance and non-finance. Talent makes up the majority of the difference.
- **Table 4:** OLS regressions of finance, talent and finance X talent, considering individual (gender, background etc) and fixed co-efficient with dummy variables. High statistically significant for talent and talent x 1finance for all year, positive co-efficient.
- **Table 5 adds to 4**, including log(project size) and log(project size) interaction with 1finance. Positive, statistically co-efficient but explanatory power decreases.
- **Table 6:** OLS of log(yearly gross wage) with contributions to experience level, general skills, and interactions with talent.
  - Experience in finance, with interactions highly statistically significant with positive contributions.
  - General skills different, Technical skills make negative contributions, technical skills not very relevant to finance.
  - R-squared drops considerably.
- **Figure 5:** Share of top-talent in finance increases over the years versus all talent.
- **Table 7:** OLS regressions of performance-pay share and log(total wages)
  - Performance-pay share with interactions/isolations to talent
  - Statisitically significant contributions, positive contributions to log(total wages), and interactions with finance.
- **Table 8:** OLS regression of log(total wages) controlling for network and background effects (not top school, parent occupation, first generation, foreigners).
  - Talent and interaction with finance positively corelated, statistically significant across all groups with high R-square values.
- **Table 9:** OLS regressions using Henkman model to control for selection effects. Looks at Henkman model, Within-talent school measures, natural experiments.

- Henkman considers wage and all underlying factors
- Supelec is measure of lower selectivity – controlling for abnormal shock increase in number of students (difference in difference technique) hence supelec x After and 1Finance x supelec x After.

Methodologies:

- Consider one period economy with talent and project size, yielding economy size
  - TxS^(a) – S – w(T), find argmax
- Find argmax S(T) to match talent wit project size.
- Add industry related factors to define wage of talent in industry i
- Cental equation displayed below

$$\ln(w(T_n)) = \ln(w(T_0)) + \underbrace{\gamma_{-i}}_{\text{Returns to talent in the rest of the economy}} \times \ln\left(\frac{T_n}{T_0}\right) + \underbrace{(\gamma_i - \gamma_{-i})\mathbb{1}_i}_{\text{Incremental returns to talent in industry } i} \times \ln\left(\frac{T_n}{T_0}\right) + \underbrace{\beta_i \times \mathbb{1}_i}_{\text{Residual premium for working in industry } i}$$

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- Measure to access relative returns of finance.

$$\ln(w_{n,t}) = \eta_{-f} Talent_n + (\eta_f - \eta_{-f}) Talent_n \times \mathbb{1}_{Finance_{n,t}} + \beta \mathbb{1}_{Finance_{n,t}} + \lambda X_n + \mu D_t + \lambda_{j,t}.^{18}$$

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Difficulties/Interesting Points

- Exploit education system, selecting students on highly competitive examination
  - Discriminates right tail of skill distribution, most of finance premium lies.
  - All completed masters engineering degree from elite university
  - Tackles endogeneity concerns as assess students at same level and field of education.
  - Selection process access EQ/Soft skills
- Assess stock market performance at graduation to alleviate further endogeneity concerns associated with self-selection into finance.
- Analysis prior to technology boom – interesting to see if/how the trend progresses.

Ellul, A., Pagano, M., & Scognamiglio, A. (2020). Career risk and market discipline in asset management. The Review of Financial Studies, 33(2), 783-828.

Research Question(s):

- *Does managerial labour market act as a device for disciplining asset managers, over and above the incentives provided by the firm?*
  - This question explores if asset managers are exposed to the risk of permanent career setbacks when their fund is liquated following underperformance.
  - Salaries of employees in financial firms typically higher than everywhere else, extreme in asset management, more so in hedge-funds, with compensation differentials of top-line managers reflecting agency rents, a discretion typical of asset management calls for high-powered incentive pay schemes.
  - Compensation is performance-sensitive, asymmetrically to upside and downside risk.
- Alternative hypothesis: Fund liquidations induce career setbacks even in absence of underperformance, as labour market frictions may prevent employees from finding an equally attractive job after liquidation.

Summary of Findings:

- *Labour markets help discipline fund managers through liquidations in their careers, over and above the incentives stemming from managerial compensation (i.e., Incentive can both depend on the 'carrot' (compensation) and the 'stick' (career damage))*
- Top managers suffer demotion in addition to significant loss in imputed compensation, after persistently poor performance which leads to fund liquidation. These setbacks are concentrated within this group, and the calculated loss in imputed compensation approximates to $500,000 if the estimate is performed without conditioning on previous fund performance.
    - Liquation: Fund transitions from 'live fund' database to 'graveyard' database in TASS database. Funds may liquidate because:
      - Realization of downside risk
      - Dissatisfied with market trends
      - Restructure capital and portfolio of funds
      - Regulatory intervention
      - Reset watermark clause in incentive fees (data shows unlikely to be liquidated for this reason)
  - Fortunately, there is an absence of scarring effects in liquidation after normal relative performance, or involve mid-level employees.
  - Gender, education etc. do not differ significantly between the matched control and liquidation groups
  - **Scarring effects** can ascribe to a drop in asset manager's reputation from the lens of moral hazard and adverse selection.
    - **Reputational losses**

        - **Accidental losses:** accidental destruction of professional's human capital owed to overall, adverse market trends.
        - The difference associated preceding poor relative performance. Scarring effects only present in consistently underperforming funds two years before liquidation.
        - Top ranking managers of funds, liquidated after two years of average performance, suffer job demotion and an imputed compensation loss over the subsequent five years ($752,000 larger if fund performed normally before liquidation)
    - Performance-based liquidations supplement compensation-based incentives.
    - Focus on hedge fund professionals as incentive concerns, and career implications, expected to be salient for the following complimentary reasons:
        - HF industry is quintessentially the business of risk taking (a single poor decision could blow up a fund)
        - HF managers have greatest discretion in investment choices as lightly regulated, creating moral hazard and up-and-out contracts with dynamic incentives.
        - HF strategies closely align by strategies of managers opposed to other institutional investors.
        - Therefore, fund performance is a good proxy for managerial talent.
    - Finance professionals face a 'double-edged sword' – 'carrot' in incentives, 'stick' in career setbacks

Summary of Tables:

- **Figure 1: Dataset Sources**
    - 13,056 HF professionals from TASS database, critically as links to the hedge funds they manage, enabling liquidation transparency.
    - Shows connections to other sources to find suitable datapoints, including compensation related information for computation.
    - Issues with incomplete data, and sample may under-represent both extremes as reduced incentive to publish positions.
        - Issues with sample selection given omittance of HF managers akin to 'George Soros' and lowest performing managers.
- **Table 1: Job levels and imputed compensation**
    - Match resume job listing with SOC codes from publicly available databases to create six-tier corporate hierarchy.
    - Find employment sectors by assigning employers of 1948 individuals to one of six
        - Total number of employers is 6,771 (2,129 from LinkedIn etc., remainder using ML algorithm)
    - Imputed compensation calculated via average salary (Levels 1-4) corresponding to SOC Code in OES database, 10-K (Levels 5-6) for fixed and variable compensation. **Both measure the potential earnings capacity in a dollar equivalent for each job level.**
        - Steepest increase from Job level 4 (middle management) to level 5 (top management)
        - R-squared from OLS regression is 0.76 for imputed compensation from linear associated with job levels as the result of:
            - Convex functionality at higher levels
            - Differences in job mapping to compensation across different sectors (Asset Management vs non-financial)
            - Variation between, and within job levels
- **Table 2: Employee Characteristics**
    - 42,339 observations (1948 individuals, 22 years)
    - 75% of all person years dominated by asset management industry, 59% studied economics or finance, 33% of individuals obtain level 6
    - Median job level is middle management (median compensation $221,000), with $1,582,000 average compensation much higher
        - Significant skew
- **Figure 2: Career profile (experience (years) vs Average Fixed and Total Compensation)**
    - After 15 years of experience (years), average fixed begins to plateau at $200k
    - Total compensation continues to increase in a roughly linearly pattern (starts at $1m, triples to $3m after 45 years). Most increase in first 25 years.
    - Variable component increases proportionately more as experience increases.
- **Figure 3: Career trajectory by Cohort (Experience (years) vs Average Job Level (1-6))**
    - Three cohorts who entered the hedge fund industry (1980-89, 1990-99, 2000-16)
        - (1980-89) and (1990-99) have a similar projection, 2000-16 slower and suffer setback around 15 years of experience, likely from crisis and not insulated in top-positions (still climbing the corporate hierarchy)
- **Table 3: Fund Descriptive Statistics**
    - Monthly returns of hedge funds in TASS database (19,367) and author's sample, classified by six fund strategies
    - Panel A reports entire TASS sample
        - Mean benchmark returns range from 0.73% to 1.32%, with high volatility, given high-risk strategies.
        - The standard deviation in relative performance is large (absolute return of relevant fund – benchmark fund) .
    - Panel B shows difference in paper sample versus TASS database
        - Mean difference in all funds is 0, implying datasets align
        - However, paper dataset overrepresents relative, and security selection funds with positive, statistically significant co-efficient, while underrepresenting multi-process fund of funds, and security selection liquidated funds.

- **Figure 4:** Fund performance (6,577 in TASS database) and AUM prior to liquidation
  - Relative performance, AUM and Rate of return all drop significantly from 48 months prior to liquidation
- **Figure 5:** Funds with positive absolute performance prior to liquidation (two years)
  - Downward trend – no special insights
- **Figure 6:** Entry into the hedge fund industry
  - Immediate jump in imputed compensation by $750,000, $1,000,000 over the next 30 years
- **Table 4:** Career outcomes on entering the hedge fund industry
  - **Column 1:** OLS Regression on Job Levels considering education (Top 15 School), experience in AM, Gender, Previous Job Level as dummies.
    - All statistically significant positive contributions, except gender where negative contribution, implying less
  - **Column 2:** Add past fund performance, past benchmark, log(AUM)
    - Past fund performance only significant with 0.063 contribution to job level.
  - **Column 3&4:** Replicate 1 and 2 but for imputed compensation (thousands, USD)
    - Previous compensation not economically significant but statistically significant.
  - **Overall**
    - Evidence of gender pay gap and job progression
    - Talent is rewarded (Column 1,2,3)
    - However, these results do not relate to career progression after liquidation.
- **Figure 7: Hedge Fund Liquidations (Frequency vs Year of Liquidation)**
  - Significant left skew, peaks in 2009 aligning with the financial crises, but liquidations occur in regular times.
- **Figure 8: Job level around liquidation (Liquidated vs Matched Control)**
  - No change to matched group through time and liquidated group prior to liquidation
  - Clear reduction in average job level from the liquidated group by 0.2, recovering to approximately pre-drop levels but never matching control group again.
- **Figure 9: Imputation around liquidations (Liquidated vs Matched Control)**
  - No change to matched group through time and liquidated group prior to liquidation
  - Clear reduction in imputed compensation from the liquidated group by 200k, recovering to approximately pre-drop levels but never matching control group again.
- **Figure 10: Employer switching around imputation (Liquidated vs Matched Control)**
  - Slow decline of matched group through time with resemblance of a straddle for liquidated group prior to liquidation
  - Clear increase in job switching from the liquidated group by 0.2, dropping to approximately pre-drop levels but never matching control group again, as continues to be higher.
- **Figure 11: Average Job around liquidations (Liquidated vs Matched Control, high-rank vs low-rank)**
  - Thematically the same as reported in figure 8 for job level 5 and 6, but job levels 3 and 4 continue to closely follow matched control post liquidation.
- **Figure 12: Imputed compensation around liquidations (Liquidated vs Matched Control, high-rank vs low-rank)**
  - Thematically the same as reported in figure 9 for job level 5 and 6, but job levels 3 and 4 continue to closely follow matched control post liquidation.
- **Figure 13: Imputed compensation between managers who manage more than five funds, compared to those less than five**
  - Managers who manage many funds suffer an imputation loss about $500,000 less (statistically significant) to those who manage fewer funds. Aligns with theory company returns top fund managers as demise of one fund unlikely to lead to the demise of the company
- **Table 5: Other post-liquidation career outcomes**
  - Job in Asset Management and being a founder are negative correlated (statistically significant) with liquidation at levels 5 and 6, with no statistically significant outcomes in managers starting in job levels 3 or 4
- **Table 6: Fund performance and careers outcome post liquidation**
  - There are both statistically significant negative contributions to job level and imputed compensation when liquidation follow poor performance.
  - Job-switching is minimal post liquidation after good performance, but statistically insignificant post poor performance.
- **Table 7: Fund performance and careers outcome post liquidation compared to benchmark**
  - Panel A: Benchmark has positive performance in the last two years prior to liquidation
    - **Strong negative correlated on job-level and imputed compensation**
  - Panel A: Benchmark has negative performance in the last two years prior to liquidation
    - Statistically insignificant results except for slight positive correlation with job-switching prior if good performance prior to liquidation.
- **Table 8: Fund performance and careers outcome post liquidation between high and low ranking employees**
  - Panel A: Starting from Job Levels 5 and 6
    - Same outcome as Table 7, Panel A but from perspective of high vs low ranking employees
  - Panel B: Starting from Job Levels 3 and 4
    - Same outcome as Table 7, Panel B but from perspective of high vs low ranking employees

Methodologies:

- Data- 1948 Individuals (1963-2016) who worked in the HF industry (Lipper-Tass Database), designated as low, middle, or top managers.
  - Point of Difference: Not all managers become CEO's differentiating from other studies.
  - Does not permit explicit tests of labour market effects on managerial effort. However, scarring effects provide evidence on labour scarring effects.

    - Dataset likely overrepresents talented individuals given the attraction in the industry.
- Difference-in-Difference framework, combined with matching, to compare evolution of careers for those who experience liquidation versus those who do not.
    - Controls unobserved talent by including individual fixed effects (gender, education, initial job level etc) when matching
    - Clear ground of correlations between liquidations and career outcomes induced by assertive matching i.e. liquidated funds run by untalented managers who would have had lack luster careers anyway.
    - Individual FE removes impact of differences on unobserved effects of talent on jobs and salaries, while the matching process filters out the influence of observed characteristics.
- Propensity score matching, in combination with the instance of first fund liquidation as the event of interest
    - One-on-one matching algorithm with nearest neighbour based on matching (gender, education, etc.) characteristics without replacement.
- Specification Model
    - $$y_{it} = \alpha_i + \lambda_t + \sum_{k=-5}^{5} \delta_k L_{it}^k + \epsilon_{it},$$
    - Y(i,t): Variable of interest (job level, compensation, employer-switch)
    - Alpha(i): Individual fixed effects
    - lambda(t): Year effects, relative to liquidation year
    - L(I,t,k) = L(i)x**1**(t=k) set of dummies equal to 1 before or after liquidation if individual experiences it [-5,+5]
    - Normalise delta(-1) to 0 to identify a sequence of delta(k) interpreted as the change in outcome after the event by comparison to individuals who didn't feel the effects of the liquidation
- Specification model to explore scarring effect (career setback affected by relative performance before liquidation).
    - $$y_{it} = \alpha_i + \lambda_{gt} + \gamma L_{it}^{post} + \delta L_{it}^{post} \times P_{it}^{-} + \epsilon_{it},$$
    - L(I,t,post): Liquidation dummy equal to one in five years after liquidation, 0 otherwise.
    - P(I,t,-): Poor performance dummy, period of two years if average monthly return falls below benchmark.
    - Gamma is effect of career outcomes after liquidation preceded by normal relative performance.
        - -ve evidence accidental liquidation occur after normal performance have scarring effect, 0
    - Delta in this instance captures incremental effect of poor performance (-ve measures career slowdown due to reputation loss from liquidation)

Difficulties/Interesting Points:

- Make adjustments for survivorship bias in the dataset relying on information in 'live fund' and 'graveyard' section of TASS database.
- Sample biased against scarring effects as people under report career setbacks on profiles (Should be listed as a lower bound)
- Hand collected employee-level information from resumes from professional networking websites (educations, employment histories)

Week 4: Pay-out Policy (HL)

Jacob, Martin, and Roni Michaely. "Taxation and dividend policy: the muting effect of agency issues and shareholder conflicts." The Review of Financial Studies 30.9 (2017): 3176-3222.

Research Question(s):

- How does dividend taxation affect pay-outs?
    - Is this impact subdued by agency issues or shareholder conflicts?

Summary of Findings:

- **Overview:** When the taxes on dividends decrease (increase) relative to wages/other income we expect shareholders to demand an increase (decrease) in dividends to increase their wealth. From a reduction in dividend taxation in Sweden in 2006, we saw an increase in the pay-outs of owners with a high tax preference for dividends of 44%. However, different shareholders have different preferences, and when there is heterogeneity, we see this impact of dividend tax changes significantly 'muted' as a result. A difference-in-difference-in-difference approach is used, when there are 1 owner, div/cash ratio increases by 7.3pp when there are three owners, this drops to 4.4pp, when there are 5 owners, this drops to basically zero. These findings are generally robust.

Summary of Tables:

- **Figure 3 page 3190 -** difference in (high tax preference - low tax preference) after regulation, we can clearly see a difference in difference plotted, after regulation, pay-outs increased for high tax preference firms
- **Table 4 page 3192**
    - **Column (1)** - owner (individual) level DD regression estimate, baseline interaction term positive and statistically significant, dependent variable is % of income paid as dividends (increases by 5.9pp)
    - **Column (2) -** firm (aggregate) level DD regression estimate, baseline interaction term positive and statistically significant, dependent variable is % of income paid as dividends (increases by 1.1pp)
- **Figure 4 page 3194 -** As the number of owners increases, the simple DD estimate decreases, i.e. the tax reform has less of an impact on firms with more than one owner

- **Figure 5 page 3195 -** The dotted lines become further apart, this suggests that relative to two/three/five owners, wholly owned firms are increasing their pay-out ratios after the legislation reform.
- **Table 5 page 3197** - the impact of 1,2,3,4,5 owners on div/total income is monotonically decreasing, this is robust to controls and mostly significant, ultimately this suggests that the more owners there are, the greater conflict there is, and the less responsive firms are to changes in taxation policy
    - **Column (4)** - results aren't being driven by small firms
    - **Column (5)** - results aren't being driven by size and cash holdings across firms
- **Figure 6 page 3200** - looking at firm level data (div/total assets) the increase in this ratio, decreases as the number of owners in the firm increases
- **Table 6 page 3201**
    - The proportion of firms that pay dividends increases after the legislation, more impact when firms have fewer owners (monotonic)
    - When scaling dividends by total income our findings remain generally consistent (no evidence of difference between one and two owner firms)
- **Table 7 page 3202**
    - Results are not being driven by firms in the top tax bracket
    - We can calculate an elasticity of −5.3 (=74% relative dividend increase / 14% relative tax cut)
    - For firms with five or more owners the elasticity is statistically not different from zero
- **Figure 7 page 3203**
    - Essentially, we can see that the same impacts are not seen in public firms (who weren't affected by the same legislation), this suggests that we are not merely picking up the impacts of background macroeconomic effects
    - This is BS, public firms have so many owners
- **Table 8 page 3204**
    - Controlling for firm and shareholder level variables, we see that our results are robust, overall firms with above a 51% tax rate increase their payout ratio, but this decreases with every additional owner
- **Figure 8 page 3206**
    - Total compensation doesn't really change, but the way that it is distributed changes significantly in firms with one owner and less in firms with more owners
- **Table 9 page 3209**
    - The higher the heterogeneity, the lower the change in pay-out ratio, suggesting that out-of-sync shareholders result in lower impact of legislation.
- **Table 10 page 3211**
    - The more separated ownership and management are, the less impact that legislation has due to possible agency issues
- **Table 11 page 3212**
    - Both agency and shareholders have a statistically significant impact on the tax sensitivity of dividend payouts

Techniques

- **Data set & the exogenous shock:** The authors use a unique data set which contains the corporate tax returns for all Swedish corporations and their respective owners. An exogenous shock – the 2006 tax reform – allows the authors to examine the tax sensitivity of dividends.
- **Diff-in-diff:** Using diff-in-diff approach where: Difference (1) is the difference in dividend compensation between high and low tax groups (High tax = owners subject to a marginal income tax above 51%) and Difference (2) is the difference between before and post the 2006 tax reform.
- **Diff-in-diff-in-diff:** Figure 5, pg. 3195: Difference (1) is the difference between high- and low-tax owners. Difference (2) is the difference between owners of wholly-owned firms to owners of firms with multiple owners over time. Difference (3) compares the responsiveness before the reform to after.
    - *The triple-difference (DDD) estimate quantifies the decline in dividend tax responsiveness as ownership becomes more dispersed.*

Difficulties / Interesting Points

- How should policymakers react to these findings? Essentially, if they want to be effective in adjusting payout policy, then they need to ensure that agency or shareholder conflicts are small somehow. There are frictions when using tax policy as a tool to adjust payouts, this must be considered

Grennan, Jillian. "Dividend payments as a response to peer influence." Journal of Financial Economics131.3 (2019): 549-570.

Research Question(s)

- What is the effect of peer influence on a firm's dividend payments? (And who are these peers?)
- Background: Firms' decisions to change their dividend payments tend to occur at similar times
- Dividend peer effects manifest in the choice of a target payout ratio or adjustment period. If many peer firms are increasing their dividend payments, a firm will either shorten the adjustment period or increase the target payout ratio, if it wants to increase its dividend as well.
- Observed payout ratios are examined as a proxy for target payout ratios, as well as the time between dividend changes as a proxy for the adjustment period

Summary of Findings

- **Table 4 – Main Results**
  - The findings show that ***dividend peer effects exist*** and are ***more pronounced for dividend increases*** - this finding of asymmetry is consistent with prior survey evidence
  - The 18% reported in Column 1 of Panel A is interpreted as follows: a standard deviation increase in the fraction of peer firms increasing dividend payments increases the probability that a firm will increase dividend payments by 18% on average, ceteris paribus
- **Table 5 – Comparison to other firm-specific variables**
  - Peer influence does not displace other known dividend determinants as evidenced by the statistical significance of several firm-specific covariates.
  - Peer influence has a coefficient of 17%, market-to-book has a coefficient of 5%, and leverage has a coefficient of -5%. In terms of economic magnitude, these are the three most significant, **positing peer influence as one of the most important determinants of dividend policy**
- **Table 6 – IV**
  - Panel A focuses on the adjustment period as proxied for by time to dividend change and reveals **dividend peer effects manifest in the adjustment period**
  - As reported in Column 1, a standard deviation increase in peer influence shortens the expected time to dividend change by approximately 1.5 quarters.
  - Panel B of Table 6 focuses on the target payout ratio as proxied for by the size of the dividend change
  - As reported in Column 1, a standard deviation increase in peer influence leads firms to increase dividend payments by 16% more than they would if peer influence were low
- **Table 7 – Placebo test**
  - Investigates whether peer groups composed of randomly selected firms generate peer effects. Idiosyncratic risk and peer influence measures are recalculated based on the new peer group definition
  - Overall, there are **insignificant peer effects for these random peer groups**, which suggests that **peer firms defined by industry are an appropriate reference group** for evaluating peer effects
  - Note Panel B shows peer effects have no impact on earnings

Techniques:

- Peer influence is instrumented for using peer firm idiosyncratic equity risk
- ***Decrease in risk = less cash required = opts to distribute more***
- Idiosyncratic risk is distinct from industry risk and is unique at a firm-level - other firms risk cannot be linked to dividend rates
- Peer firm idiosyncratic equity risk works via the impact of peer's dividend decision - is that the only way?
- Likely meets the exclusion restriction for IV's - change in firm's IER affects only a peer firms DP through its own DP
- The method used separates market-level, industry-level and firm-level shocks; decomposition framework (Campbell et al, 2001)
- Risk of stock, j, in industry, i, in quarter, t, is: IRijt = 2ijt - Peer IR is taken as the average across all peer firms
- Also calculates on an industry-level
- Test's for existence of peer effects using eq (4) where Peer influence, Peer(− j)it, is instrumented as above
- Divjit = βPeer(− j)it ‘ + θ Xjit + f j + δt + ejit ,
  - Divjit is a dummy variable indicating increase of decrease in dividend for firm, j, in industry, i, in quarter, t
  - Peer, is the fraction of peer firms increasing or decreasing their payments - IV
  - X, is the vector of firm-specific covariates and peer averages (common and contextual effects)
  - f, is the firm fixed effect and, t, is the time fixed effect
- For (Lintner, 1956) observed payout ratios are examined as a proxy for target payout ratios and time between dividend payments for adjustment period

Instrumental variable:

- Need: The WHS and GE stylized example on pg. 549 indicates but does not definitively establish that peer effects exist. For instance, WHS and GE could be responding to common shocks. **Therefore, the author separates the peer effects from such common effects using an instrumental variable (IV) approach.**
- The IV (pg. 550): To identify dividend peer effects, they use an IV strategy in which peer influence is instrumented for using the peer firms’ idiosyncratic equity risk.
- Inclusion: It satisfies the relevance condition for IV identification. When a firm’s idiosyncratic risk decreases, the reduced uncertainty implies that the firm, needing less precautionary savings, can distribute more cash to shareholders. Similarly, when the average of the peer firms’ idiosyncratic risk decreases, the number of peer firms’ increasing their dividends should increase.
- Exclusion: The exclusion restriction for IV identification requires that the peer firms’ average idiosyncratic risk alter a firm’s dividend only via its effect on peers’ dividends. Several arguments exist to plausibly satisfy the restriction. The instrument’s construction isolates a risk that is orthogonal to market risk and industry risk and thereby idiosyncratic to a peer firm.
- IV Quality (pg. 556): The F -statistic from the first stage of the IV regression is 167.2, which exceeds the requisite 10 to ensure minimal bias of the point estimate. The IV specification includes firm-specific, industry-specific, and peer average covariates as well as firm fixed effects and time fixed effects.

Week 7: Financial Flexibility & Constraints (HL)

DeAngelo, H., Gonçalves, A. S., & Stulz, R. M. (2018). Corporate deleveraging and financial flexibility. The Review of Financial Studies, 31(8), 3122-3174.

Research Question(s):

- Do firms choose to deleverage to increase financial flexibility? Yes
    - Which financial policy decisions are most economically significant at reducing leverage and which attenuate deleveraging?
    - Heterogeneity in Deleveraging: Why do some firms not reduce debt to increase financial flexibility?

Summary of Findings:

- ***Most firms deleverage from their historical peak market-leverage (ML) ratios to near-zero ML.***
- ***Firms decisions to repay debt and retain earnings account for a large portion of observed peak-to-trough declines in ML.*** Share issuance typically has only a small direct impact on the ML ratio.
    - ***Deleveraging is dampened by managerial decisions to accumulate larger cash balances.*** Decisions to increase dividends often reduce the size and rate of ML decreases and the cash-balance build up that typically accompanies deleveraging.
- Firms that fail to attain low ML often reflect financial distress, or decisions to merge into another firm.

Summary of Tables:

- **Table 1:** When leverage is high, it tends to decrease in the next year, with the typical reduction modest in size. These findings suggest that large-scale deleveraging tends to play out in small-to-moderate steps over multiyear horizons.
- **Table 2:** deleveraging from all-time peak market leverage (ML) to subsequent ML trough transforms the typical firm from a capital structure with far more debt than cash to one with ample financial flexibility in terms of both low leverage and much higher cash balances.
- **Table 3:**
    - Considerable heterogeneity across the three groups in the magnitude of their ML reductions (compare rows 1, 2, and 8; panel A).
    - Materially understate the size of deleveraging for firms that repay all debt because ML ratios are bounded below at 0.000. Firms that pay off all debt continue to deleverage by accumulating larger cash holdings (rows 3 and 4, panel A) they triple their Cash/TA from 0.110 to 0.303 from peak to trough.
    - Many firms sell substantial amounts of assets (row 7, panel A, Table 3), but their receipt of asset-sale proceeds does not directly affect any element of their ML ratios.
    - The median firm in the full sample repays 80.2% of the debt outstanding at peak ML, retains additional earnings equal to 24.3% of the total value of debt and equity at peak ML, and increases the number of outstanding shares by 15.2% (row 7, panel A).
    - ***Some firms free up cash by reducing dividends during their deleveraging episodes***. 33.2% of firms cut dividends at some point while deleveraging (row 7, panel A, Table 3).
    - Decisions to repay debt, retain earnings, and issue shares together account for 96.5% of the actual deleveraging by the median firm in the full sample (row 9). Debt repayment alone accounts for 71.3% of the median firm's deleveraging, while debt repayment and earnings retention account for 93.7%. One again there is heterogeneity across the groups the magnitude of their ML reductions.
- **Table 4:** Share-issuance proceeds and retained earnings are economically material *indirect* contributors to deleveraging in that both are typically large relative to the amounts of debt repaid and to cash holdings at the post-peak trough.
- **Table 5:** Among dividend-increasing firms while deleveraging, median ML declines from 0.582 at the peak to 0.082 at the trough but would have been essentially zero (0.008) if cash actually allocated to dividend increases had been used to repay debt (row 1, first column). Plus median Cash/TA ratio increases from 0.042 at the ML peak to 0.089 at the trough, it would have increased to 0.120 if the firm had parked in cash balances the money that was left over after using the cash from dividend increases to pay off all debt (row 2). The results are essentially the same for firms that increase debt while deleveraging.
- **Table 6:**
    - Most firms exhibit non-trivial signs of distress at peak ML (row 1).
    - Z-scores indicate that most firms are in safe condition (row 2)
    - Most firms have large negative stock returns in the year they attain peak ML, with equity values falling a modest amount the prior year, and not declining the year before that (row 3)
    - Most firms report negative earnings in the year of peak ML (row 4)
    - Most also have lower ROA in the peak ML year than they had at the prior trough, with ROA recovering to a large degree by the trough after the peak (row 5)
    - 42.4% of ML peaks occur during NBER recessions (row 6, Table 6)
    - changes in industry ML ratios are small relative to the changes in sample firms' ML ratios (compare rows 7 and 8 in Table 6)
- **Table 7:** at the end of their deleveraging episodes, a nontrivial subset of firms has serious financial troubles and is still highly levered, with such cases concentrated among firms with four or fewer years of post-peak data.
- **Table 8:** ***financial distress will reduce the degree of deleveraging***. If the firm decides to merge, they no longer can deleverage.
- **Table 9:** firms that proactively increase ML tend to attain lower peak levels of ML (row 1), with fewer signs of trouble when at peak (row 5) and a higher return on assets at peak (row 6). They also tend to increase debt sharply in the peak ML year, while the other firms decrease their debt slightly (row 3) while seeing their equity values fall sharply (row 4).

- **Figure 6:** a weakness in their approach is that trends in event-time sample averages understate he typical scale of deleveraging because while some firms are increasing leverage others are still decreasing. However, they find their results are generally robust and their findings hold.

Methodologies:

- They adopt a long-horizon longitudinal approach that, for each sample firm, analyses deleveraging from all-time peak ML to subsequent trough.

Difficulties/Interesting Points:

- ***Large-scale deleveraging tends to play out in small-to-moderate steps over multiyear horizons***. This suggests that focusing on year-to-year leverage changes (past literature) tends to miss their cumulative effect at firms that are going through material deleveraging, and therefore often fails to identify such episodes.

Chava, S., & Hsu, A. (2020). Financial constraints, monetary policy shocks, and the cross-section of equity returns. The Review of Financial Studies, 33(9), 4367-4402.

Research Question(s):

- What is the differential impact of unanticipated monetary policy changes on financially constrained versus unconstrained firms?

Summary of Findings:

- ***Financially constrained firms suffer disproportionately lower returns after unexpected monetary policy tightening; however, it is a delayed response.***
- They experience this ***delay because*** they are either ***less liquid than unconstrained firms or lower investor attention*** is paid to these firms.
- The return differential is driven largely by cash flow news as opposed to discount rate news
- Results overall are consistent with credit channel view of monetary policy transmission, that is monetary policy affects the availability and thus supply of credit

Summary of Tables:

- **Table 1:** Sample statistics for the types of federal fund rate changes and their shock components
- **Table 2:** Sample statistics for the firms used in the sample
- **Table 3:** Firms are sorted into portfolios by financial constraint measure, the dependant variable being the portfolio return for a specific window around the announcement. Positive shocks cause negative cumulative returns across all portfolios on announcement day. As the window is extended unconstrained firms becomes insignificant, while for constrained firms the negative cumulative returns stay negative for up to 3 days after announcement
- **Table 4:** Firm level returns are now looked at. Panel A shows the raw changes to FFR while Panel B looks at the expected and shock components. A positive shock has a large significant negative effect on returns on announcement day.
- **Table 5:** Looks at the cross-sectional heterogeneity at the firm level by the addition of a dummy variable for financially constrained. The interaction term for financially constrained and the shock component only becomes significant 3 days after the announcement. The economic significance is for a 1% positive shock, constrained firms experience a cumulative return 6% and 7% lower for the 3 and 4 days after the announcement than unconstrained firms.
- **Table 6:** Use the method of Ozdagli (2018) to test whether on announcement day constrained firms experience better returns than unconstrained following a positive shock. They find this to be true that unconstrained firms on announcement have less negative returns following a positive shock, and they also confirm their finding from table 5 of the delayed and larger negative response cumulatively.
- **Table 7:** Test whether liquidity can explain why the information takes longer to be priced in for FC firms. Regress trading volume and dollar trading volume onto various interaction terms for the FC dummy and the days before and after the announcement. FC firms are traded less in the days leading up to and on the day of announcement but after the announcement there is no significant difference which lines up with the delayed effect in table 5.
- **Table 8:** Test whether among FC firms do the less liquid firms experience these effects in greater magnitude. Panel A shows constrained liquid firms and Panel B shows constrained illiquid. From panel A, the constrained illiquid firms, the negative coefficient only becomes significant on day 3 while in Panel B for the constrained liquid it is significant the day after and 2 days after. The coefficients are similar in magnitude however which shows that it is the fact that they are constrained that is driving the cumulative negative effect, whilst liquidity just delays it.
- **Table 9:** Test the effect of investor attention. Financially constrained firms with higher investor attention become significant two days after the announcement, compared to 3 days for the benchmark results, meaning more investor attention reduces the delay.
- **Figure 1:** Test the effect that monetary policy has on firm outcomes. Figure plots the impulse response of sales and net income over assets from a 1 standard deviation positive shock. Constrained firms experience a significant drop in sales up to 4 years after an announcement, and the same with net income except the decrease is quicker after the announcement.
- **Table 11:** Similar results to figure 1, finding that, a 1% in the fed rate at any time in the last 3 years would cause a decrease in investment/assets by 0.5% and a decrease in net income/assets by 1.2%.
- **Table 12:** They decompose return news into discount rate and cashflow news. The coefficients in column 2 and 3 for cash flow news and ROE news (the proxy) are both highly significant and negative, and ***so positive shocks result in negative cash flow and roe news for financially constrained firms, which lines up with the results from figure 1 and table 11 from net income and sales.***

Methodologies:

- Measure of financial constraint: White and Wu financial constraint proxy

$$WW_{i,t} = -0.091 \times CF_{i,t} - 0.062 \times DIVPOS_{i,t} + 0.021 \times TLTD_{i,t} - 0.044 \times LNTA_{i,t} + 0.102 \times ISG_{i,t} - 0.035 \times SG_{i,t},$$

  - CF - cashflow/total assets,
  - DIVPOS – cash dividend indicator variable,
  - TLTD – long term debt/total assets,
  - LNTA – log of total assets,
  - ISG – firm three digit industry growth,
  - SG – sales growth
- Measure of fed fund rate shock:

$$FFShock = \frac{D}{D-d}(f^0_{m,d} - f^0_{m,d-1}),$$

  - Fm,d – the current month futures contract price
  - Fm,d-1 – the month futures contract the day prior
  - D – number of days in month
  - d – calendar day of the month

Difficulties/Interesting Points:

- The White and Wu financial constraint proxy and financial constraint proxies in general are highly questionable with some used for robustness in the paper even being negatively correlated.
- The constraint may instead just be picking up on young, small and faster growing firms instead of actual financial constraint, and in that case what is this study really telling us?

Week 8: Cash Flow Duration (HL)

Weber, M. (2018). Cash flow duration and the term structure of equity returns. Journal of Financial Economics, 128(3), 486-503.

Research Question(s):

- Limited literature covering cashflow duration
- Several behavioural finance explanations explored as there are issues with traditional asset pricing models
- Why is the risk premium so high for assets with low duration, even at the very short end of the term structure (downward sloping term structure)?
  - Understanding what drives short duration premium
  - Behaviour finance characteristics assessed – irrational behaviour from analysts and short constraints
  - Limited focus on the impact of overlay cash flow duration as a phenomena vs traditional asset pricing literature

Summary of Findings:

- Overall findings:
  - Spread in returns exists across low and high duration stocks, implying a ***strong short duration premium***
  - ***Value stocks (low duration) outperform growth stocks (high duration)***
  - ***Hedge trading strategy*** exists where the manager can go ***long low duration stocks and short high duration stocks*** – alpha economically and statistically significant
  - Investor sentiment and arbitrage constraints are a key explanation
  - ***Mispricing could explain the downward sloping structure of equity returns***
  - Analyst behaviours:
    1) Optimistic toward high duration stocks
    2) Extrapolate past growth into future earnings
    3) High duration have earnings shock

Summary of Tables:

- **Table 1:** Descriptive statistics
  - Average payoff is 19 years – substantial cross-sectional heterogeneity.
  - ***No relationship between duration and institutional ownership.*** Institutions hold around 40% of all sharing during the sample period.
  - -ve correlation with book-to-market. High growth (high duration) companies don't have a high book to market value for example.
  - -ve correlation with ROE, but +ve correlation with sales growth.
- **Figure 1:** Time series – portfolio return over duration
  - Stocks sorted into ten deciles and rebalanced on annual basis
  - Negative relationship between duration and holding period return (i.e. downward sloping)
  - Low duration stocks have on average a one year holding period return of 25%

- High duration stocks earn less than 10%.

- **Table 2:** Mean excess returns and CAPM – Sharpe aswell
  - ***Duration is strongly related to CAPM betas*** – contrasting negative relationship for returns.
  - High duration stocks have a CAPM beta of 1.41 vs low duration stocks of 1.05.
  - **Hedge strategy exists:** Long short duration stocks and long duration stocks (D1-D10) leads to a statistically significant excess return of 1.29% per month.
  - Favourable Sharpe ratio exists with hedge strategy
- **Table 3:** Fama French (3 factor, 3 factor + momentum, 5 factor)
  - Hedging strategy across all of the FF factor models still produced alphas and remains statistically significant
- **Figure 2: Cross sectional return premium: Duration measure effected by assumptions (sensitivity analysis)**
  - Discount rate or forecast horizon have a minimal affect on the slope of the term structure of equity returns.
  - Sales growth has somewhat of an impact, however ROE persistence more so.
  - Return premium is sensitive to long run sales growth and row.
- **Table 4: Economically adjusted parameters**
  - Across the wide range of parameter values there is an economically large and statistically significant downward sloping (low duration to high duration) structure of equity returns.
- **Figure 3: Long-short excess returns: Duration sorted vs market**
  - Significant variation over time
  - Pre 2001 large duration premium.
  - Recent financial crisis low duration stocks fell by more than high duration stocks.
  - Term structure often inverts during recessions
- **Table 7: Variation with investor sentiment**
  - ***Traditional risk factors do not suffice***
  - FF adjusted excess returns following high and low periods of investor sentiment.
  - ***Strong negative relationship exist between FF adjusted excess returns in high sentiment months***.
  - High duration stocks are prone to overpricing during high sentiment periods.
  - High duration portfolios load strongly on changes to the sentiment index further supporting the thesis of potential temporary overpricing.
- **Table 8: Analyst expectations – earnings forecasts**
  - Long term earnings growth difference low duration and high duration stocks appears to close up at t+4 vs t.
  - Overly optimistic initial forecasts or mean reversion earnings.
    - Panel B analyses this, outlining that both low duration and high duration stocks growth at roughly 10% per annum – extrapolation bias for long term high duration stock forecasts.
  - Earning surprise analysis further corroborates extrapolation bias.
  - Low duration stocks have positive earnings surprises, while high duration generally experience negative or zero earnings surprise.
- **Table 9: Analyst expectations: implied return forecasts**
  - *Hypothesis: Analysts are overly optimistic about the earnings trajectory of high duration stocks*
    - Analysts forecast higher future prices relative to book value for high duration stocks.
    - Analysts implied return forecasts do not vary.
    - ***High investor sentiment results in upward sloping mean returns, downward sloping after periods of low sentiment.***
    - Results for analysts return forecasts are in contrast to realised returns.
- **Table 10: Short sale constraints and term structure**
  - Pronounced downward sloping term structure for low residual institutional ownership (short sale constrained) – confirms H1 (arbitragers constrained with low institutional ownership being a proxy for into ability to take on positions to correct mispricing).
  - Excess return decreases as institutional ownership increases.
  - Variation in return from low to high institutional ownership supports H2 (high duration portfolios should drive the difference in returns).
  - Robustness tests produce the same results.

Methodologies:

- Estimating duration for equities:
  - $$Dur_{i,t} = \frac{\sum_{s=1}^{T} s \times CF_{i,t+s}/(1+r)^s}{P_{i,t}} + \left(T + \frac{1+r}{r}\right) \times \frac{P_{i,t} - \sum_{s=1}^{T} CF_{i,t+s}/(1+r)^s}{P_{i,t}}.$$

    Forecast cash flows for finite period S (15 years) - Component same as duration for bonds

    Remainder of value in terminal value

Difficulties/Interesting Points:

- Endogeneity issues may be present due to time period

Dechow, P. M., Erhard, R. D., Sloan, R. G., & SOLIMAN, A. M. T. (2021). Implied equity duration: A measure of pandemic shutdown risk. Journal of Accounting Research, 59(1), 243-281.

Research Question(s):

- Examine ability of implied equity duration to explain U.S. stock price behavior during the COVID-19 pandemic
- How does the concept of implied equity duration explain poor performance of "value" stocks over this period?
- Is underperformance of "value" stocks during this period a rational response to lower durations? ***Yes***
- **Important definitions/ context for understanding the paper:**
    - Duration: bond/stock
        - Duration of a financial asset that consists of fixed cash flows, such as a bond, is the weighted average of the times until those fixed cash flows are received.
        - It is essentially a measure of the sensitivity of the price of a bond or other debt instrument to a change in interest rates
    - Rules: High vs. Low duration and interest rate risk
        - The higher the duration, the more a bond's price will drop as interest rates rise (and the greater the interest rate risk).
        - For example, if rates were to rise 1%, a bond or bond fund with a five-year average duration would likely lose approximately 5% of its value.
    - Time to maturity of a bond is important:
        - The longer the maturity, the higher the duration, and the greater the interest rate risk
        - The opposite holds: shorter maturity bond, lower duration = less risk

Summary of Findings:

- Measure of implied equity duration developed in Dechow et al. 2004 provides an intuitive and effective measure of the sensitivity of an equity security to a pandemic shutdown.
- ***Low duration equities have relatively more of their value in near-term cash flows***, and because a pandemic shutdown curtails near-term cash flows, low-Duration equities lose more of their value during the shutdown
- Is this something we would expect? Yes, because low duration equities should be more sensitive to any disaster that leads to a short term drop in macroeconomic activity
- Results extend current literature by building on Weber (2018) study which proposes sentiment-based explanations for his findings suggesting Duration premium (price of bond/stock above its issuance price) will be smaller during periods of low sentiment (financial crises)
- The current study extends this analysis, by demonstrating investors rationally anticipate that a disaster, followed by a quick recovery, has a disproportionate negative impact on the value of low-Duration stocks relative to high-duration (based on the idea crises curtails short term cash flows, 1-2 years, after which recovery is expected)
- Demonstrate that their implied equity duration framework can be used to understand the significant underperformance of value stocks (I.e., stocks with high book-to-market ratio) during onset of pandemic shutdown)
- These value stocks generally tend to be in a secular decline and therefore have a lower duration, with these lower durations value stocks lose more market value during short-term decline in macro-economic activity – so larger relative declines in value stocks can be viewed as rational response to onset of pandemic
- Results aim to explain why previous research has found cash flows of stocks more sensitive to onset of recessions and authors reinforce prior lit. But demonstrating duration provides theoretical basis for understanding previous results that relate to the value factor
- Essentially value serves as a noise proxy for Duration and there is a need improved measures of equity duration rather than relying on ad hoc proxies of value such as BM or EP ratios.
- **Overall: paper shows low duration stocks and value stocks suffer greatest declines in value and have greatest increases in risk during onset of pandemic**
    - This increased risk of short-term cash flow during temporary economic downturn can explain why term structure of equity risk premia is **downwards sloping** during recession

Summary of Tables:

- Table 1: Summary stats: for the primary variables in each of our two sample periods.
    - We compare the pre-pandemic period (the 14,097 trading days from 1964 to 2019) to the pandemic period (the 62 trading days from January 2 to March 31, 2020).
    - Panel A indicates that all variables have means that differ significantly across the two periods. All variables in the 2020 pandemic column excluding excess returns are calculated as of December-end 2019. The ***average Duration is 19.28 years in the pandemic period versus 17.41 years in the pre-pandemic period***, likely reflecting the changing composition of the U.S. economy from manufacturing (lower duration firms) toward technology (higher duration firms).
- Table 2: Shows how duration varies across industries at the beginning of the pandemic period.
    - The low-duration industries are mainly in the energy and financial sectors, whereas the high-duration industries are primarily in the technology and health sectors.
    - The final column of table 2 reports the average stock return for each industry during the first quarter of 2020.
    - This ranges from a low of −63.33% for Coal to a high of 3.95% for Medical Equipment.

    - Incorporate industry fixed effects in some of our subsequent analyses to control for the impact of potentially correlated omitted industry-level variables (see tables 7, 8, and 9).
- Table 3: Duration Portfolio characteristics
    - The first two rows of panel A of table 3 report the portfolio average Duration, which is the sorting variable.
    - In the pandemic period, Duration ranges from 13.94 years for the lowest quintile to 23.53 years for the highest quintile, whereas in the pre-pandemic period, the corresponding range is from 9.19 years to 23.25 years.
    - Next two rows report the annualized Excess returns for the two periods. Consistent with our primary prediction, the pandemic period excess returns are monotonically increasing in Duration.
    - The annualized spread between the highest Duration quintile and the lowest Duration quintile is 145%, which is both statistically and economically significant.
    - Important: Final 2 rows report volatility – show that stock return volatility is elevated in the pandemic period and low duration portfolios have significantly greater volatility – suggesting short run cash flow risk was dominant source of risk in pandemic period
- Table 4: presents the results for forming portfolios on Book- to-market.
    - The results are basically the reverse of those in table 3, though the magnitudes of the high minus low quintile spreads are somewhat smaller.
    - For example, the annualized Excess return spread in the pandemic period is −122% when sorting on Book-to-market versus 145% when sorting on Duration.
- Table 5: reports similar results for sorting on Earnings-to-price.
    - Results are essentially the reverse of table 3 results, but the magnitudes of the high minus low quintile spreads are somewhat smaller. For example, the annualized Excess return spread in the pandemic period is −130% when sorting on Earnings-to-price versus 145% when sorting on Duration. These results suggest that the value measures serve as noisy proxies for Duration, thus explaining the poor performance of value at the onset of the pandemic.
- Additional Tests:
    - Table 6 (Additional Tests) – examines relation between Duration and analysts' EPS forecasts during the onset of the pandemic.
        - Panel A of table 6 reports the results using value-weighted averages.
        - The Pre-pandemic forward yield is monotonically decreasing in duration, confirming the validity of our measure of Duration.
        - Panel B of table 6 reports similar results using equal-weighted averages. Although equal weighting does not produce a perfectly monotonic negative relation between Duration and Pre-pandemic forward yield, the negative spread between the low-duration quintile and the high-duration quin- tile is even more pronounced.
    - Table 7, Table 8, Table 9:
        - Incorporate industry fixed effects in some of our subsequent analyses to control for the impact of potentially correlated omitted industry-level variables

Methodologies:

- Essentially value serves as a noise proxy for Duration and there is a need improved measures of equity duration rather than relying on ad hoc proxies of value such as BM or EP ratios.
- Employ measure and estimation procedure for implied duration developed by Dechow et al. 2004 and subsequent use by Weber 2019
- Estimation proceeds 2 key steps
    - Estimates of future cash flows are generated – using past financial various and autoregressive processes for profitability and growth to generate forecasts of future cash flows over a finite forecast horizon
    - Resulting cash flow is substituted into standard bond duration formula to generate implied equity duration
- ***Key point: Implied – is included in this measure of duration because terminal cash flows are imputed from the current market value of equity – these contrasts fixed income securities, in which all promised future cash flows are specified in advanced***
- Formula to measure implied equity duration:

$$Duration = \frac{\sum_{t=1}^{T} t * CF_t/(1+r)^t}{ME_0} + \left(T + \frac{1+r}{r}\right) * \frac{ME_0 - \sum_{t=1}^{T} CF_t/(1+r)^t}{ME_0}. \quad (1)$$

    -
        - Following Weber 2018: use finite forecast horizon T of 15 years and discount rate r of 12%
        - ME(0) is current market value of equity
- Impute cash flows CF using clean surplus relation:
    - Where Change in BE denote the change in book value of common equity and g(t) denote growth rate in book value of common equity.
    - Following Dechow et al 2004 forecast ROE(t) (earnings(t)/BE t-1) by assuming ROE (0) follows first order autoregressive process with persistent coefficient of 0.39 and long run mean of 12%
    - Forecast growth in book equity (gt) by assuming g(0) follows first-order auto-reg process coefficient of 0.21 and long run mean of 6%
    - Following Dechow et al 2004 also assume g(0) the growth rate by using sales rather than book value of equity as sales provides more accurate forecast of future growth in book equity than using current growth in book equity.
- EQUATION 1 & 2 – are related to 3 well-known characteristics of underlying equity securities

1) it is decreasing in the current earnings-to-price ratio (Earnings0/ ME0),
2) it is decreasing in the current book-to-market ratio (BE0/ME0), and
3) it is increasing in the current growth rate (g0)

- 4 SPECIAL CASES and intuition behind these relations
  - ***1) Earningst =BEt = 0 for all t ≤T***
    - Forecasts of cash flows in the finite forecast period are all zero and the formula for equity duration reduces to:

$$Duration = \mathrm{T} + \frac{1+r}{r}. \qquad (3)$$

    - T = 15% r = 12% and duration is 24.33 years
    - Case provides a good calibration for a high-duration stock: in such a firm all value is embedded in future growth opp. that are reflected in terminal value
  - ***2)*** **ROEt =ROE0 and gt = 0 for all t ≤ T**
    Formula for implied equity duration simplifies to

$$Duration = \mathrm{T} + \frac{1+r}{r} - \frac{Earnings_0}{ME_0} \times \frac{\mathrm{T}}{r}. \qquad (4)$$

    - Expression highlights that duration is decreasing in the earnings- to-price ratio. Intuitively, the forecasts of cash flows in the finite forecast period are all equal to Earnings0 and so a higher Earnings0 implies a greater proportion of ME0 is generated in the finite forecast horizon, thus decreasing duration.
  - ***3)*** **ROEt = r and gt = 0 for all t ≤ T**
    - In this case, Dechow et al 2004 show the formula for implied equity duration simplifies to:

$$Duration = \mathrm{T} + \frac{1+r}{r} - \frac{BE_0}{ME_0} \times \mathrm{T}. \qquad (5)$$

  - ***4)*** **ROEt = gt > 0 for all t ≤ T**
    - Duration measure is same as in case 1

$$Duration = \mathrm{T} + \frac{1+r}{r} \qquad (6)$$

Difficulties/Interesting Points:

- Impute cash flows CF using clean surplus relation:
- An alternative perspective to explain such underperformance of low duration stocks would be that duration sorts equities on characteristics of underlying businesses
- These characteristics essentially determine a firm's exposure of their sales, profits, cash flows to an economic downturn/pandemic
- The key assumption here would be that all firms experience a proportionate decline in their short term cashflows
- However, we would expect investors to anticipate declines differently across industries
- For instance, airline stocks would suffer a sharper/deeper decline and experience a more skewed V shaped recovery than bio tech stocks based on the nature of their operations
- Airline industry suffered significantly greater losses due to restrictions on travel causing greater investor overreaction for future share price decreases, whereas bio tech stocks have more optimism associated with the anticipation of a good vaccine (12-24 months down the line)

Week 11: Earnings Forecasts and Stock Valuation (HL)

Maslar, D. A., Serfling, M., & Shaikh, S. Economic Downturns and the Informativeness of Management Earnings Forecasts. Journal of Accounting Research, Forthcoming.

Research Question(s) & findings:

- Does the informativeness of management forecasts change during a recessionary period? ***Yes***
- Do investors begin to rely more on management forecasts during a recession? ***Yes***
- Do analysts rely more on management forecasts during a recession? ***Yes***
- Does managements forecasting accuracy increase during a recession? ***Yes***

Summary of Tables:

- Period 2002 – 2017 (note there was only one recessionary period in this sample – Dec 2007- Jun 2009)
- Bundled forecasts (B) – Forecasts within +- 2 trading days of earnings announcements
- Unbundled forecasts (UB) – outside of +- 2 days of announcement
  - The important difference between bundled and unbundled is that bundled forecasts have less discretion of what information they release / include. Unbundled typically occur upon a certain event happening to a firm so these are affected by noise.
- **Sample:** 47,093 bundled and 14,275 unbundled management forecasts on 2295 unique firms. 57% of forecasts are bad news
- **Table 2:** Show univariate results comparing the mean values of variables in recession and nonrecession periods over the years 2002-2017.

- Main findings: Presents that several firm and forecast characteristics are different in positive and negative states of the economy for both bundled and unbundled forecasts. Hence, reinforcing the need for control variables and fixed effects in the later tests

- **Figure 1 & 2** – analyse likelihood of management publishing bundled/unbundled forecasts. See that this declines towards the latter part of the recessionary period studied (Dec 2007 – Jun 2009)
- **Table 3:** present results from regressions examining whether forecast characteristics are different in the recession for bundled and unbundled forecasts, respectively.
  - Range forecast is more likely during a recession for B forecasts – e.g., earnings between 100-120m
  - Time horizon of forecast increases during recession B & UB
  - Firms are less likely to publish bad news forecasts during recession
  - ***Conclusion: results provide some evidence that managers adjust the features of their earnings forecasts during downturns.***
- **Table 4:** presents results from regressions examining whether investors find news in bundled and unbundled management forecasts more informative during downturns.
  - The dependent variable in all four columns is the one-day abnormal return on the day a management forecast is announced.
  - News is the new information communicated in a management earnings forecast which is calculated as the difference between the managers EPS forecast and the consensus analyst forecast scaled by the absolute value of the consensus analyst forecast. ***Note: consensus analyst forecast = median analyst forecast***
  - The positive and statistically significant coefficient on News in all the models implies that investors' reactions follow the direction of management forecast news in normal times. The positive and statistically significant coefficient on the interaction term between news and our recession variable in all four models implies that investors react more strongly to news in management forecasts in the recession.
  - For bundled forecasts, the coefficient on News implies that in normal times management forecasts that deviate by one standard deviation from the analyst consensus (about a 24.1% deviation) are associated with stock price changes of 1.24%.
  - In contrast, the coefficient on News × Recession implies that the same management forecast deviation is associated with an additional 0.40% change in stock prices during the recession. Thus, investors' reactions to the same amount of news in management forecasts are 32.1%(= 0.401/1.244) greater during the recession.
  - Investors react 48.1% more for unbundled forecasts
- **Table 5:** Looks at how investors react to bad news relative to good news during recessionary period
  - GoodNews equals News when News is greater than or equal to zero and equals zero if News is less than zero
  - Similarly, BadNews equals News when News is negative and equals zero when News is greater than or equal to zero.
  - ***Presents that the average reaction to badnews is greater than that for good news across all four models***.
  - Larger reactions to news in unbundled management forecasts during downturns are driven by investors reacting more to bad news. This suggests that investors might view a release of bad news from sporadic forecasts during downturns as especially credible. Conversely, the results suggest that investor's view sporadic good news announced in unbundled forecasts during downturns as potentially less credible, leading to smaller market reactions.
- **Table 6:** Looks at whether management forecasts are seen as more informative than analysts in good times and recessions
  - ***Hypothesis: investors may also find management forecasts more informative relative to analyst forecasts in downturns*** because they perceive managers as better positioned to predict how an unusual operating environment affects their firm's performance
  - News for analyst forecasts as the difference between an individual analyst's forecast and the consensus analyst forecast, all scaled by the absolute value of this consensus forecast
  - The ***coefficient on News × Recession is statistically insignificant across the models,*** suggesting that investors do not view news in analyst forecasts as more informative during down-turns. This finding is contrary to prediction and a contrary result is later found with a larger sample. This result could be the result of sample selection.
  - The positive and statistically significant coefficient on News × MngFcst in all four columns in table 6 implies that news in management forecasts is more informative to investors than the same amount of news in analyst forecasts in normal times
  - Moreover, the positive and statistically significant coefficient on News × Recession × MngFcst in all four columns suggests that the incremental informativeness of management forecasts relative to analyst forecasts increases even more during the recession.
  - Although the results suggest that reactions to news in analyst forecasts are not significantly larger in downturns
- **Table 7:** Examines whether good or bad news forecasts drive the larger stock price reactions to management forecasts relative to the reations to analyst forecasts during the recession
  - The insignificant coefficient GoodNews × Recession × MngFcst in three out of four columns implies no differential reaction to good news in management and analyst forecasts during the recession.
  - However, the positive and statistically significant coefficient on BadNews × Recession × MngFcst in all four columns implies that compared to reactions to bad news from analysts during the recession, the same amount of bad news from managers causes larger drops in share prices.
  - The results in this section suggest a hierarchy in the informativeness of different sources of information during downturns.
- **Table 8:** use analyst forecast revisions to investigate whether analysts also view managers' firm-specific knowledge as especially informative during the unusual operating state characterized by downturns

- dependent variable, AnalystFcst Revision, is the difference between each analyst's first forecast in the 30 days after a management forecast is released and the same analyst's last forecast in the 30 days before the management forecast was released, all scaled by the absolute value of this last forecast. If an analyst does not update her forecast in the 30 days after the management forecast, we set the analyst forecast revision to zero.
- Independent: NewsAnalyst, equals the difference between the management forecast and the individual analyst's last forecast in the 30 days before the management forecast, all scaled by the absolute value of this last forecast
- Columns 1–4 show positive and statistically significant coefficients on NewsAnalyst, implying that analysts revise their forecasts in the direction of the news in management forecasts in normal times for both bundled and unbundled forecasts.
- Columns 1 and 2 also show positive and statistically significant coefficients on NewsAnalyst × Recession, implying that analysts revise their forecasts even more to news in bundled management forecasts during the recession
- In contrast, the insignificant coefficients on NewsAnalyst ×Recession in columns 3 and 4 imply that analysts do not revise their forecasts more to news in unbundled management forecasts during the recession

- **Table 9** examines whether bad news management forecasts also drive the larger analyst forecast revisions during the recession
  - ***Columns 1 and2 show positive and statistically significant coefficients on the bad news interaction terms*** and statistically insignificant coefficients on the good news interaction terms
  - In contrast, columns 3 and 4 show positive but mostly statistically insignificant coefficients on the bad news interaction terms and statistically significant negative coefficients on the goodnews interaction terms. Thus, although analysts do not revise their forecasts more to bad news provided in unbundled forecasts during the recession they revise their forecasts less to good news in management forecasts, suggesting that analysts may view unexpected good news forecasts announced during the recession with skepticism.
- **Table 10 -** Tests the accuracy of management forecasts relative to analysts during downturns
  - If managers' information advantage improves during downturns, we would expect a corresponding increase in the accuracy of management forecasts relative to the accuracy of outsiders' forecasts
  - Dependent variable MF Error − AF Error equals the management forecast error less the error in the prevailing consensus analyst forecast at the time of the management forecast
  - For managers, the forecast error is the absolute value of the difference between a manager's forecast and the actual earnings reported at the end of the forecast period. For analysts, the forecast error is the absolute value of the difference between the consensus analyst forecast at the time of the management forecast and the actual earnings reported at the end of the forecast period scaled by the absolute value of the average of the management and the consensus analyst forecast to facilitate comparisons.
  - The negative and statistically significant coefficients on Recession in all four columns in panel A of table 10 imply that the relative accuracy of management forecasts increases during the recession.
  - To determine the economic significance of the increase in managers' relative forecast accuracy, they compare the coefficients to the standard deviation of the dependent variable, which indicates how much the distribution shifts during the recession
  - During normal times, the standard deviation of MF Error − AF Error equals 22.8 and 18.7 for bundled and unbundled forecasts, respectively.
  - Columns 2 and 4 imply that the accuracy of management forecasts relative to that of analyst forecasts increases by 4.2% (= 0.967/22.8) and 6.3% (=1.174/18.7) of their respective standard deviations during the recession
  - ***Find that the stronger stock price reactions and analyst forecast re-visions to news in management forecasts during downturns are concentrated mainly in bad news forecasts throughout our analyses.***
  - Next the paper tests whether these larger reactions to bad news forecasts can be explained by an even greater increase in the relative accuracy of bad news management forecasts.
  - Panel B shows negative and statistically significant coefficients on Recession × BadNewsDum in all four columns, implying that the relative accuracy of bad news management forecasts increases during the recession for both bundled and unbundled forecasts.
  - For bundled forecasts, the coefficient on Recession × GoodNews-Dum is positive and statistically significant. One interpretation of this result is that managers' information advantage over analysts during the recession resides in their ability to assess the negative consequences of the downturn better.
- The findings of the paper —particularly that greater stock price reactions tend to be concentrated in bad news forecasts—may also arise from market participants displaying ambiguity aversion. i.e. reacting more to bad news then good news due to a behavioral bias. If this is the case, we would expect a share price reversal. This reversal does not exist ruling out this conclusion

Difficulties/Interesting Points:

- No difficulties or interesting points to add

Cao, S., Jiang, W., Wang, J. L., & Yang, B. (2021). From Man vs. Machine to Man+ Machine: The Art and AI of Stock Analyses (No. w28800). National Bureau of Economic Research.

Research Question(s):

- How does the performance of a financial analyst compare with an AI analyst?
- Can the combination of both create an even better analyst?

Summary of Findings:

- How does the performance of a financial analyst compare with an AI analyst?
- AI analyst is able to beat the majority of human analysts in stock forecasts
- Man + Machine: the combination attains better performance than either side alone, but also the incremental value of human does not weaken with the technology.
- Augmenting humans with new technologies constitutes a promising direction for the analyst profession rather than the displacement of human analysts.

Summary of Tables:

- **Figure 1:** Plots the beat ratio where AI forecast is more accurate then the human. The total beat ratio in the sample is 53.4%. Beat ratio is quite a volatile and exhibits a downwards trend as time goes on suggesting the incorporation of ML, better data packages and collection methods becoming available
- **Table 2:** Comparison of the various ML models used, with the final model being a combination neural net, random forest and gradient boosting.
- **Table 3:** Looks at the difference in beat ratio taking into account levels of human skill. For top half of skilled analysts based on prediction error across various formation periods they are reasonably close to the AI. For humans consistently in the top half for three years in a row or more actually beat the AI.
- **Table 4:** Form a trading strategy based of analyst and AI forecasts, where if the predicted value AI>Analyst then stock is bought and if AI<Analyst then stock is sold. Strategy is able to generate alpha of 91 basis points per month for the long-short portfolio with 1 month rebalance and 92 basis points for the 6 month rebalance.
- **Figure 2:** They make a hybrid "man+machine" analyst where analyst forecasts are now also fed into the AI as well all the other public information. Shows that beat ratio is now more consistent over the sample period and out performs the human 57.3% of the time compared the AI alone model of 53.4% versus the human
- **Figure 3:** Compares the hybrid analyst to the just AI analyst where the hybrid beats the AI 56.6% of the time and in every year of the sample. This outperformance increases over time and represents the incremental information of the humans.
- **Table 5:** Dependant variable in Panel A is Analyst beats AI which is an indicator variable and in Panel B is just the difference in squared prediction between Analyst and AI. The results show that humans perform better when it comes to firms that are smaller, less liquid, have higher intangible assets and over a shorter horizon. The AI performs better in the opposite and also when 8k reports are higher so when the volume of information is greater.
- **Table 6:** Has hybrid beats AI and hybrid beats human indicator variables has dependant variables. Shows that the incremental information from humans is more valuable for less liquid firms, firms with more intangible assets, longer horizons and in more difficult times. Analysts from brokerage houses increase analyst beats AI but add no extra to the hybrid model.
- **Table 7:** Event study focusing on analysts covering firms with access to alternative data. Results show that analyst covering these firms do perform better but only when it is at a firm that has the AI capabilities to process it. Analysts in general at AI hiring companies also perform better versus the AI than normal analysts.

Methodologies:

- Beat ratio: Absolute difference between AI predicted price and actual price being greater than the absolute difference between analyst predicted price and actual price.

Difficulties/Interesting Points:

- Combination of AI with human analysts appears to be a promising combination in the future
- Can become an arms race in terms of who will put the money to get the best hardware to support the increasing power of ML models
- Humans still possess advantages over AI when there is higher information asymmetry, and where more specific experience and nuance is required.

Week 12: Innovation (HL)

Kelly, B., Papanikolaou, D., Seru, A., & Taddy, M. (2018). Measuring technological innovation over the long run. American Economic Review, Insights, Forthcoming

Research Question(s):

- Can textual analysis of high-dimensional data from patent documents to create new indicators of technological innovation better measure technological innovation than current methods?

Summary of Findings:

- Can textual analysis of high-dimensional data from patent documents to create new indicators of technological innovation better measure technological innovation than current methods?
- Their importance indicators correlate with existing measures of patent quality but also provide complementary information. They identify ***breakthrough innovations as the most important patents***—those in the right tail of their measure—and construct time-series indices of technological change at the aggregate and sectoral level.
- Their breakthrough index accurately identifies waves of innovations better than patent counts, forward citations and estimated market values of patents.

Summary of Tables:

- **Panel A of Figure 3 + Appendix Table A.2:**
  - (Row 1 in Panel A of Figure 3) reveals a strong positive contemporaneous correlation between patent importance and forward citations and is consistently economically significant across horizon, increasing the importance measure from the median to the 90th percentile results in 1.5 additional citations, relative to the median of 3 citations
  - (Row 2 in Panel A of Figure 3) shows that their importance measure predicts future patent citations. They find a strong positive association between their near-term quality measure and long-term future citations. An increase in the patent importance from the median to the 90th percentile predicts 20-25% more future citations
- **Panel B of Figure 3 + Appendix Table A.3:**
  - Patent importance is positively and statistically significantly correlated to the KPSS estimate of market value. Increasing the importance measure from the median to the 90th percentile results in 0.23–0.47% increase in patent values.
  - Appendix Table A.3 shows that the correlation remains significant once they include as additional controls the number of forward citations the patent receives over the same horizon that importance is measured—which supports the conclusion that their measure incorporates additional information to patent citations.
- **Figure 4** compares the different methods used to measure innovation and shows that their breakthrough index is superior.
  - Panel A plots the time-series of breakthroughs per capita and shows that their index identifies three main innovation waves, lasting from 1870 to 1880; 1920 to 1935; and from 1985 to the present
  - Panel B plots an index of per-capita of patent counts, which highlights the issue of using patent counts as a measure of innovation. Patents per capita is essentially flat from 1870–1930, dips from 1930–1980, and displays a significant spike post-1980.
  - Panel C (black line) plots the time-series of 10-year forward citations and highlights the difficulties in using forward citations as a measure of patent importance because it shows more of an exponential curve when the innovations in the 1850–1940 era are at least comparable to the those in the last two decades.
  - Panel D plots a time-series index that is based on the estimated market values of patents that are granted. This index has the advantage that it provides a dollar estimate of the value of innovation output in a given year. However, it is confined to the universe of publicly traded firms, thereby omitting innovations by private firms, non-profit institutions and the government. Moreover, it is not available prior to 1927, since information on stock prices is readily available only after this year.
- **Figure 5:** plots time-series indices of industry innovation at the 3-digit NAICS level. We see that the origin of breakthrough patents has varied considerably over time. In the 1840–70 period, we see that the most important inventions took place in engineering and construction, consumer goods, and manufacturing.

Methodologies:

- leverage natural language processing techniques to create links between each new invention and the set of existing and subsequent patents.
- Construct measures of textual similarity to quantify commonality in the topical content of each pair of patents.
- Identify an important patent as one whose content is distinct from prior patents (is novel), but is similar to future patents (is impactful).
- These innovations represent distinct improvements in the technological frontier and become the new foundation upon which subsequent inventions are built.
- If citation data were objectively determined and consistently available, a breakthrough innovation would receive a large number of future citations.

Difficulties/Interesting Points:

- This paper highlights the difficulties in measuring innovation by providing pros and cons to past approaches and proposes a new approach that seems to be better than past methods.

Chen, M. A., Wu, Q., & Yang, B. (2019). How valuable is FinTech innovation?. The Review of Financial Studies, 32(5), 2062-2106.

Research Question(s):

- Large financial institutions and technology firms are increasingly investing in FinTech innovation.
- Study provides the first large-scale evidence on the occurrence and value of FinTech innovation by examining:
- Key Questions:
  - How much do firms in the financial services sector stand to gain from their own FinTech innovations?
  - How do FinTech innovations affect the financial services sector and its key component industries: banking, payment processing, brokerage, asset management, and insurance
  - What explains the wide cross-sectional variation in the value effects of FinTech innovation?
  - How FinTech innovation affects value from the viewpoint of individual incumbent firms, that is, market-share leaders and their rivals.

Summary of Findings:

- Find that FinTech innovations are ***generally valuable to innovators and to financial sector*** as a whole
- ***For some financial industries however certain types of FIntech innovations can have an adverse value impact***
- The value effects on an industry are more negative when an innovation comes from young, non-financial firm and brings forth disruptive technology
- Market share leaders tend to suffer less from outside disruptive innovation if they have invested heavily into their own R&D

Summary of Tables:

- **Table 1: Categories of FinTech**
  - It is apparent from Table 1 that some categories (e.g., data analytics) are quite broad, and their constituent technologies are already in widespread use across many financial industries. Other categories (e.g., P2P or robo-advising) are associated with a narrower set of industries.
- **Table 2: Performance of machine-learning methods in classifying patent filings**
  - Performance of the various machine-learning classifiers we apply to our sample
  - Panel A of Table 2 shows that, among the individual classifiers tested, the neural network classifier and the linear SVM classifier are the top two models in terms of F1 score and accuracy.
  - To achieve stronger classification performance, we use a simple majority-rule "voting" classifier that aggregates predictions of the linear SVM, Gaussian SVM, and neural network models
  - Panel B of Table 2 reports the in-sample classification performance. As seen in the table, the voting algorithm has in-sample precision of 97.7% and recall of 98.3%.
  - The last column of panel B shows the number of cases in the text-filtered sample that the voting classifier assigns to each category.
  - Based on the final classification, the sample consists of about 66.2% nonfinancial filings, 23.3% non-FinTech financial filings, and 10.5% FinTech filings
- **Table 3:** shows the number of patent filings removed by the filtering and name matching steps
  - After removing problematic cases that are missing requisite data, leaves a sample of 21,145 filings by U.S.-based firms or individuals, of which 14,634 are non-FinTech financial filings and 6,511 are FinTech filings
- **Table 4** reports the frequencies of FinTech patent applications filed by various groups of innovators.
  - As seen in the table, public firms, private firms, and individuals filed, respectively, 37.3%, 23.0%, and 39.7% of all FinTech applications.
  - ***Nonfinancial firms are an important group of innovators***, accounting for 34.8% of FinTech filings. FinTech startups—which we define as nonfinancial firms founded no more than 8 years prior—account for nearly one-fourth of all filings made by nonfinancial companies.
  - Among public firms in the financial services industries, banks are by far the most active innovators, followed by payment processing companies.
- **Table 5:** Fintech innovation activity by technology category and innovator type
  - Considers whether certain types of innovators exhibit more activity in certain FinTech categories.
  - Panel A shows that public firms dominate most of the seven categories, but private firms substantially contribute to total firm-based innovation activity in robo-advising (59.4%), mobile transactions (42.0%), data analytics (37.6%), and cybersecurity (36.0%).
  - Nonfinancial firms innovate heavily in cybersecurity, mobile transactions, and P2P, whereas financial companies account for more than half of all blockchain and IoT filings made by firm.
- **Table 6:** reports the results of the Poisson regressions.
  - Panels A, B, and C are based on filer-years corresponding to public firms, private firms, and nonfirm individuals, respectively.
  - As seen in the table, for most categories, public firms that are larger tend to file more FinTech patent applications.
  - Among private firms, firm age and the extent of prior non-FinTech filings are strong positive predictors of FinTech innovation. Finally, for individuals, the most consistent predictor of FinTech filing activity appears to be prior innovation experience in non-FinTech financial areas
- **Table 7** reports summary statistics for private values of innovation within nine different groups:
  - The seven distinct FinTech categories, the set of all FinTech innovations, and the set of non-FinTech financial innovations.
  - The table also reports mean CARs for each of the nine groups. As seen in the table, FinTech innovations create economically sizeable private value: the average value to the innovator is $19.7 million, and the median value is $35 million.
- **Table 8** reports the regression results.
  - ***Column 1 shows that blockchain is the most valuable category of innovation***, followed by robo-advising.
  - These categories are associated with significantly more valuable innovation compared to the baseline category of mobile transactions.
- **Table 9:** We summarize the industry value impact of FinTech innovations
  - Each cell in the table shows, for a given technology-industry pair, the median value impact from innovations within that technology category.
  - Also reported in each cell are the mean value impact (in brackets) and a two-tailed p-value (in parentheses) for a test of zero median

Methodologies:

- The empirical analysis requires having reliable estimates of the values of individual FinTech innovations
- Authors create method for recovering the underlying value of a FinTech innovation in the presence of anticipation of multiple innovation events. Important to correct for rationale anticipation to avoid biased estimate of value of innovation
- Our method is sufficiently general that it can be used with different models of patent count data (Poisson, negative binomial, zero-inflated Poisson, etc)
- focus here on the well-known Poisson count distribution used by Hausman, Hall, and Griliches (1984) and others in studies of patenting activity.

- Let V0 be the intrinsic value of a firm without a patent event and let V ∗ be the incremental value of one patent event to the firm.
- Assume the number of patents, N, that will occur during the time interval (t,t +T] follows a Poisson count distribution:
- Using equations 2 and 4: can derive incremental value of a patent is given by

$$V^* = \frac{\Delta \overline{V}}{\frac{\lambda}{1-e^{-\lambda}} - \lambda} = \frac{e^{\lambda}-1}{\lambda}\Delta \overline{V}, \qquad (5)$$

-
- where change V ≡ V 1 − V 0 is the observed change to the market value of the firm upon occurrence of the patent event.
- In the case of public firms, for a given technology category k we estimate the following regression using maximum likelihood estimation (MLE)

$$\log(\lambda_{i,k,t}) = \alpha + \beta_1 Size_{i,t} + \beta_2 RD_{i,t} + \beta_3 RD_{i,t-1} + \beta_4 RD_{i,t-2} + \beta_5 RD_{i,t-3} + \beta_6 Age_{i,t} + \beta_7 PriorFinTech_{i,t} + \beta_8 PriorOtherFinancial_{i,t} + \beta_8 PriorNonFinancial_{i,t} + \gamma_i + \delta_t + \varepsilon_{i,k,t} \qquad (6)$$

where i and t are indices for the innovating firm and year, respectively. In the regression, $Size_{i,t}$ is total assets (in 2003 dollars); $RD_{i,t-n}$ is R&D expenditures

-

In the case of private firms, we estimate the following regression:

$$\log(\lambda_{i,k,t}) = \alpha + \beta_1 Age_{i,t} + \beta_2 PriorFinTech_{i,t} + \beta_3 PriorOtherFinancial_{i,t} + \beta_4 PriorNonFinancial_{i,t} + \gamma_i + \delta_t + \varepsilon_{i,k,t} \qquad (7)$$

Likewise, we estimate the following regression for individual innovators:

$$\log(\lambda_{i,k,t}) = \alpha + \beta_1 PriorFinTech_{i,t} + \beta_2 PriorOtherFinancial_{i,t} + \beta_3 PriorNonFinancial_{i,t} + \gamma_i + \delta_t + \varepsilon_{i,k,t} \qquad (8)$$

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Difficulties/Interesting Points:

- The empirical analysis requires having reliable estimates of the values of individual FinTech innovations
- Through this study authors examine occurrence of FinTech innovation and value it brings to innovators, industries and incumbent firms
- Use a new method that combines observed stock price reactions with estimated Possion arrival intensities
- Limitations exist in the studies approach with respect to using market reactions to study the value of Fintech innovation
- While important outcome of innovation process, patent applications only capture part of firms innovation activities
- Some firms have unsuccessful innovation attempts while others choose to forego patenting process altogether and rely on trade secrets to protect their discoveries
- Another limitation is that authors cannot accurately measure direct costs of FinTech innovation due to aggregated nature of R&D spending
- Stock price data is also not well suited to studying the impact that FIntech is likely to have on non-US firms, privately held, firms' customers and employees.

Week 5: Capital Structure (HB)

Korteweg, A. (2010). The net benefits to leverage. Journal of Finance, 65(6), 2137-2170.

Research Question(s):

- What is the market's valuation of the net benefits to leverage?
- How much can a given firm's value be increased by adjusting their capital structure?
- Which firm characteristics affect the optimal leverage ratio, and in which direction?
- Is there evidence that firms are persistently under or over levered beyond what is justifiable by friction costs?

Summary of Findings:

- p. 2140 – A key equation is defined: the value of a levered firm is equal to the value of its unlevered counterpart plus the net benefits of leverage (net present value of benefits minus costs of debt financing). $VL = VU + B$
- p.2142 – if firms within the same industry have a common asset beta (βU) then the differences in leveraged beta (βL) observed in an industry are driven entirely by the net benefits to leverage.
- p.2143 – if L* is a firm's optimal capital structure, then there are costs associated with moving toward L and costs associated with being away from L. These costs are collectively known as 'friction costs'.
- ***The paper's main finding that firms can increase their value by 5.5% through optimal leverage***
- ***Overall:***
    - Net benefits are increasing in leverage for low-debt firms but decrease as leverage becomes very high, implying the existence of an optimal capital structure.
    - The optimal leverage is increasing in profitability and decreasing in company size.

- The firms are generally slightly under levered due to the firms that have no interest-bearing debt (true zero leverage firms).
- The over levered firms are more likely to rebalance their capital structures when gains to refinancing are moderately high, but this likelihood decreases as the potential gains rise

Summary of Tables:

- Data
  - The author uses a sample of firms in the national association of insurance commissioners, because all insurance companies are required to file all their bond trades (debt). Firms without any long or short term debt are also included in the sample, sourced from Compustat.
  - The author notes, importantly, that the equity value of zero debt firms is not necessarily equal to their unlevered value, as the market may be anticipating these firms levering up in the future to capture some of these benefits
- Table 3 p. 2152
  - Higher profitability is consistently associated with a higher optimal leverage ratio.
  - Higher depreciation is consistently associated with a lower optimal leverage ratio.
  - Volatile profits are consistently associated with a lower optimal leverage ratio.
  - Recessions lower the optimal leverage ratio for firms.
- Figure 2 p.2154
  - Here we see the net benefits to leverage, or the percentage of firm value added or lost at each level of leverage for a given level of firm characteristic. X's mark the maxima of each of the curves.
  - ***The paper's main finding that firms can increase their value by 5.5% through optimal leverage is found in these figures.***
- Table IV p. 2157
  - In the FF sample, the average observed firm has a leverage ratio of 17.9%, whereas their optimum would be 26.9%.
  - The average interest paying firm has a leverage ratio of 22.5%, but an optimal of 27.9%.
  - The average non-interest paying firm naturally has a leverage ratio of 0, but an optimal ratio of 18.9%. This drops when a firm is also identified as not paying dividends.
- Table V, p.2159
  - Taking column 1 as an example, D_INT0 * D_DIV0 shows that firm leverage is greater than optimal when a firm pays no interest or dividends. The change in sign from D_INT0 implies that firms paying dividends but with no debt are under levered, as per the findings in table IV.
- Figure 5, p. 2166
  - Here we see the probability of firms refinancing as a function of the gain to refinancing.
  - We see that over levered firms are much more likely to de-lever with moderate benefits to de-levering, however are very unlikely to when the potential benefits are great. This is likely because they are in a position where they are unable to simply adjust their capital structure.
  - We see inconclusive evidence that under levered firms increase the debt in their capital structure as the benefits of leverage grow. These results are almost certainly skewed by firms that maintain zero leverage.

Methodologies:

- Estimate the net benefits to debt financing using a new relation between a firm's market value, systematic risk (beta), and net benefits to leverage, extending the Modigliani and Miller (1958) result.
  - In this model, net benefits are defined as the (ex ante) present value of all future benefits minus the costs of debt. Assuming that firms within an industry have the same asset beta, cross-sectional differences in equity and debt betas are entirely driven by the net benefits.
  - Use this cross-sectional variation to identify the level of net benefits, and how they vary as a function of firm characteristics. An important benefit of this approach is that it is not susceptible to the two problems with cross-sectional regressions.
- OLS Regression analysis, logistic regression

Difficulties/Interesting Points:

- No comment

Hoberg, G., & Prabhala, N. R. (2008). Disappearing dividends, catering, and risk. The review of financial studies, 22(1), 79-116.

Research Question(s):

- What explains the disappearing dividends between 1978 and 1999?
- Does risk account for the disappearing dividend phenomenon?
- Is the decision to pay dividends driven by investor demand for dividend payers?

Summary of Findings:

- Fads such as a preference for dividends do not explain why dividends are paid / not paid, more likely explanations are risk, the structural change of share repurchases becoming a thing and president nixon.
- ***Risk is a significant determinant of the propensity to pay dividends, and it explains roughly 40% of disappearing dividends.***
- They find little support for the behavioral finance view that disappearing dividends reflects firms' catering to transient fads for dividends.
- Without control for risk proxies for fads matter, but these proxies are insignificant once we control for risk.

- Their results are robust to an extensive battery of robustness tests that vary samples, time periods, proxies for fads, the types of empirical tests, and the nature of payout decisions made by firms.

Summary of Tables:

- *A risk-based explanation for the disappearance of dividends*
    - **Table 1**, Panel (A) pg. 87: Controlling for the Fama-French 3 factors, the authors find that risk (systematic and idiosyncratic) is a significantly negative determinant of the probability of a firm paying a dividend in year t
        - Note: this is consistent across each of the periods split by the Panels
    - **Figure 1**
        - The upper panel confirms the disappearing dividend story from Fama and French (2001)
        - After accounting for risk, the propensity to pay in the later periods is lower than in the pre-1978 period. Suggesting that risk can only explain part of the disappearing dividends
    - **Table 2**, Panel B, pg. 90: Comparing the propensity to pay dividends without risk (row 1) with the propensity adjusted for risk (row 2), we find that risk explains about 40% of the disappearing dividend puzzle
- *A Catering Based Explanation for the Disappearance of Dividends*
    - **Table 3,** pg. 92: Using dividend premium as a proxy for dividend catering:
        - Panel (A), Row (2) & (4): Not controlling for risk, they find that the dividend premium is significant. However, once controlling for risk, the dividend premium variable becomes insignificant and R2 becomes essentially zero.
    - **Table 4**, pg. 95:
        - The authors use a set of alternative dividend catering proxies
        - Panel (A): While the Closed end discount variable is positive and significant, the other two (Sentiment index – BW & Indicator announce index) are negative. Opposite of what we would expect for the dividend catering story
        - Adjusting for risk, each of the alternative catering proxies become insignificant
    - **Table 5,** pg. 100:
        - Explore the robustness of their findings by going outside the scope of the propensity to pay framework by examining catering theory's other predictions regarding long-term return reversals and an increase retail ownership after dividend events
        - Panel A: Initiators exhibit no evidence of negative long-term returns instead the post 1-year return is positive – opposite of the reversal prediction from baker and Wurgler
        - Panel C: The results suggest that institutional ownership increases after initiations, which contradicts the catering theory.
    - **Table 9,** pg. 110:
        - In this section the authors explore whether the periodic surges in dividend payer valuations from are not related dividend fads but to more orthodox reasons like risk and cash flows.
        - The dividend premium behaves like a portfolio of large firms with few growth prospects.
        - The results suggest that these risk dimensions drive the relationship between the dividend premium and dividend payer status.
    - **Table 10,** pg. 111:
        - The value of dividend and nondividend-paying stocks reflect information about the future cash flows of these two types of stocks and not the catering proxy Baker and Wurgler use to measure dividend fads.

Methodologies:

- OLS regressions for most of the analysis
- Event study to measure abnormal returns of dividend paying stocks vs non dividend paying

Difficulties/Interesting Points:

- *The researchers only considered risk as being a measure of stock price movement. Is it fair to assume that managers decisions to pay out dividends are based on their share price, or would be there decisions rather be based on their revenues or income? A potential area of future research for this paper may be looking at movements in income or revenues as a measure of risk.*
- *The initiator index used in table 4 as an alternative proxy to the dividend premium would have been a much better proxy for dividend fads than the dividend premium used by baker and Wurgler. If Baker and Wurgler had used this initiator index which makes more sense than their dividend premium they would have found out straight away that their results do not hold.*

Week 6: CEO (HB)

Pan, Y., Wang, T. Y., & Weisbach, M. S. (2016). CEO investment cycles. Review of Financial Studies, 29(11), 2955-2999.

Research Question(s):

- Do CEOs invest cyclically over their tenure? Is this a reflection of their agency-theory based behaviour?
- Does a CEO investment cycle exist?
- What causes such an investment cycle?
- Agency Theory or a Skills Based Argument?
    - Agency theory says a CEO will invest in projects which serve them best, and enable them to build their own legacies

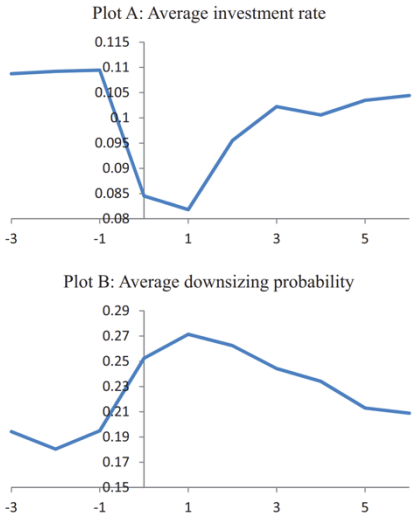
- For many reasons, CEOs usually prefer their firms to grow, potentially at the expense of shareholder value maximization. The board of directors is an important constraint on CEOs' ability to deviate from the shareholders' interest. However, as a CEO becomes more powerful in the firm over time, he will have more sway over his board and will be able to undertake investments that maximize his utility at the expense of firm value.
- Skills based theory suggests that each CEO has different skills and to maximise the value of these skills to the firm, different investments are needed etc
- We measure the CEO's capture of the board by the fraction of the board appointed during his tenure

Summary of Findings:

- ***Shortly after a new CEO takes office, the firm's disinvestment rate rises sharply, while the firm's investment and growth rate are relatively low. As the CEO's tenure lengthens, the disinvestment rate declines, and the investment rate and growth rate increase continuously and substantially.***
- The effect of the CEO cycle on investment is of the same order of magnitude as the effects of other well-known factors, such as the business cycle, political uncertainty, and financial constraints.
- ***The CEO investment cycle is best explained by agency theory because more investment is optimal from a value-maximization perspective. Investment quantity increases with increased CEO influence over the board, while investment quality decreases.*** Reversals of poor investment decisions occur after a CEO step down and a successor takes office.
- There is no robust pattern in R&D expenditure over the CEO cycle.

Summary of Tables:

- **Table 1: Summary statistics**
  - Mean capex rate = 5.9%
  - Mean acquisition rate = 3.8%
  - Mean total investment rate = 9.4%
  - Mean asset growth rate = 18.4%
  - Mean employment growth rate = 7.9%
- **Figure 1 CEO investment cycle**



  - When a new CEO comes in, the investment rate immediately drops and then increases, this is inversely proportional to the probability of downsizing
  - Investment rate increases with tenure
  - Disinvestment is more likely to occur at the start of a CEO cycle
- **Table 2 page 2966 Investment rate and CEO tenure**
  - It is clear that the investment rate increases once a new CEO comes in, however, was this just because the previous CEO made bad investments?
  - ***The paper finds that even when there is a shock change in CEO (from Illness or death) the findings remain the same; this means that CEOs aren't just being changed due to bad investment (or that as a result of this, new CEOs are being brought in who make better investment decisions)***
  - Panel B Investment increases the over the tenure of the new CEO
  - Panel D - The investment rate is higher than that of peer firms, which suggests that it is the CEO making the difference, and not the general trends of the industry
  - Tenure is significantly related to investment rate when controlled by other key variables
- **Table 3 page 2971 Disinvestment probability and CEO Tenure**
  - Disinvestment is when asset sales > 0 or discontinued operations >0 panel A of the table shows that as the tenure of a CEO increases the probability of divestment decreases, this finding is statistically significant in every case
  - Panel B - the probability of downsizing announcements decreases over the tenure
  - Tenure is significantly related to disinvestment probability when controlled by other key variables
- **Table 5: Comparing the magnitude of the CEO cycle with other factors affecting investment**

    - The CEO cycle affects investment more than a recession or election, and similar to an increase in financial constraints
- **Table 6: Summary of explanations for CEO investment cycles and their empirical support**
    - Management irrelevance (no relation between management and investment) and efficiency (ability to choose good investments increases with tenure) explanations have no empirical support
    - Agency explanation (misalignment of incentives gives CEOs a preference for overinvesting for growth) has empirical support
- **Table 7 page 2982 Agency explanations for the investment cycle**
    - The number of co-op (new directors after a CEO arrives) might suggest that a CEO has more power, and is better able to serve themselves in an organisation, supporting the agency theory view. When we control for % of new directors the tenure coefficient is no longer statistically significant. This indicates that investment is related to control of the board, not tenure, this strongly supports the idea of agent CEOs acting in their own best interests, as co-op directors are less likely to scrutinise their behaviour.
    - The channel through which CEO tenure affects investment is indeed the control over the board that the CEO acquires over time
- **Table 8 page 2985 Investment quality**
    - Panel B shows that CEOs make lower quality investments as their tenure increases (through event study methodology). Again this supports the idea of an agency-theory based argument
    - 13% (percentage points) more deals have a negative abnormal return after years 0 to 2 of the CEO cycle than during it → quality of investment decreases with tenure
    - Average abnormal return decreases from 0.642 to -0.360
- **Table 9: Agency explanations for the disinvestment cycle**
    - Segment termination (disinvestment) is more likely to occur if a CEO is replaced and a segment is underperforming
- **Table 10 page 2990 CEO investment cycles in Single- versus Multi-industry firms**
    - The researchers show that disinvestment does not depend on the new CEOs fit within the firm (based on previous industry experience)
    - CEO fit is not related to probability of disinvestment over their tenure
    - Results support agency-based explanation
- ***Overall an agency argument is supported much more than a skills based argument.***

Methodologies:

- Sample - 4,219 CEO turnovers in 2,991 firms between 1992 and 2009
- General regressions
- Event study to look at impact of investment announcements
- Investment rate and disinvestment rate analysed over time
- Regressions of investment rate and disinvestment rate against tenure and control variables
- Comparison of magnitude of cycle against other key drivers of investment and disinvestment
- Analysis of quality of investment at early vs later stages of CEO cycle using abnormal return window as a proxy
- Regression analysis of possible explanations (agency vs efficiency)

Difficulties/Interesting Points:

- Research and Development expenses do not change over the tenure of an individual CEO, does this support the idea of stewardship theory?
- Behavioural argument - CEOs become attached to the acquisition that they make, they place higher value on them arbitrarily, new managers don't share this sentiment (endowment effect)
- Can we really generalize and say all CEOs are selfish?
- No agency-based resolutions have yet been widely implemented to control the CEO investment cycle
- Skill does not appear to be a driver of the cycle or its effects

Cabezon, F. (2020). Executive Compensation: The Trend Toward One Size Fits All. Available at SSRN.

Research Question(s):

- To what extent are contracts converging?
- Why this is happening?
- What are the consequences of this?

Summary of Findings:

- **Abstract:** This paper reports the prevalence of a "one-size-fits-all" trend in the structure of executive compensation plans. The way firms distribute total compensation across different components of pay–salary, bonus, stock awards, option awards, non-equity incentives, pensions, and perquisites–has become more similar since 2006. In particular, 25% of the variation across firms disappeared in the last thirteen years. Using close votes surrounding Say-on-Pay's implementation, I find that shareholders' influence on management decisions causes part of this convergence. This finding is robust in both difference-in-difference and RDD estimations. Additional evidence suggests that proxy advisors play a role by pushing towards standardization. I find evidence suggesting that standardization leads to a sub-optimal design of contracts. The more similar a firm's compensation structure becomes to the others, the lower its market value. Additionally, I find a negative impact on delta and vega and a positive impact on total compensation and financial misstatements.

- **Overview:** Optimal incentive contracts are not the same the same for every firm; the trend of homogenising contracts contradicts the research question(s)

Summary of Tables:

- No comment

Methodologies:

- **Method:** Author uses a multidimensional vector comprised of 6 contract components, measuring the cosine similarity between firms
  - Enables firm-level of the structure of compensation packages, doesn't capture contingencies to contracts
  - Market rates used in the study are from the firm's perspective; managers will view risk differently
- **The General Trend – Figure (1)**
  - Average similarity increases from 0.5 in 2007 to 0.62 in 2019, a 24% increase in similarity over this time
  - This pattern is consistent across firm size, age, profitability and between industries
    - Results are robust to individual elements; no pay component solely explains the convergence
  - The author finds that once stocks + options were combined – the trend before 2005 was fairly flat, increasing after 2007
- **The link with SoP and Proxy Advisory Firms**
  - Introduced in January 2011, requires all public firms to submit compensation plans to a non-binding shareholder vote
  - Might increase convergence if shareholders have homogenous preferences and are inadequately informed about optimums
  - Empirical findings show that the majority of investors, retail and instos, use proxy advisory firms to inform their votes
    - (Ertimur, Ferri, Oesch, 2013): -ve proxy recommendations increase the number of -ve votes by 24.7%
    - The two largest proxy firms hold 91% of the market – issue?
    - Small number of firms + limited time leads to a "best compensation practices" approach that leads to a "one-size-fits-all" approach – convergence
  - *Combined effect of SOP, increasing passive institutional ownership and increasing proxy-advisory firms = convergence*
- **Testing this hunch – 3 tests**
  - *Does the level of institutional investors correlate with convergence trends?*
    - Regressed similarity on the level of into ownership: if more institutions invested in a firm, their level of convergence grows
    - Found that passive institutions appear to absorb the proxy advice more than actives – in line with literature
  - *Do proxy recommendations make compensation more homogenous?*
    - Firms with less homogenous packages are likely to receive a negative SoP recommendation from proxies in the following vote
    - Also finds that a firms convergence increases in the periods following a negative recommendation – investors are listening
  - *Are compensation plans converging to the optimal composition for proxy firms?*
    - Author simulates a vector that mimics the implied preferred compensation structure based on recommendations
    - Finds a clearly increasing trend towards the proxy firms "ideal structure" – not the actual company optimum
- **Impact of SoP**
  - In 2011, SEC also required shareholders to vote on the frequency of the SoP voting; every 1, 2, or 3 years
    - In theory, firms with more frequent exposure to SoP should converge faster
    - More exposure to proxy firms advise through SoP votes, the greater amount of convergence
  - *Difference-in-Difference*
    - Conducts this test between 3- and 1-year frequency firms whose vote outcome gap was large; minimise omitted firm-traits that could influence the SoP frequency vote – try to focus solely on the preference for SoP from investors
    - Firms that voted every year increased their compensation similarity in 0.038 more than firms every 3 years
    - Magnitude of the local average effect is about 8%
  - *Regression Discontinuity was also run*
- **Economic Impact**
  - Finds that converging firms reduce their pay-stock return and their pay-stock risk sensitivity ad well as decreased Tobin's Q and desire to innovate (proxied by patents and R&D investment)
- **Instrumental Variable**
  - Constructs IV based on overlapping board membership in a different industry, that directors on other converging boards may bring this practice to their other boards – is this really not related to firm characteristics? – does it meet the exclusion criteria?

Difficulties/Interesting Points:

- No comment

Week 9: ML & Corporate Governance (HB)

Li, K., Mai, F., Shen, R., & Yan, X. (2021). Measuring corporate culture using machine learning. The Review of Financial Studies, 34(7), 3265-3315.

Research Question(s):

- *How do you measure corporate culture?*
- *Does corporate culture affect business outcomes?*
    - Corporate culture is a 'system of shared values (define importance)' and norms defining appropriate attitudes and behaviours for organizational members ('How to feel/behave'), path dependent and shaped by major corporate events.
    - Nebulous nature creates difficulties in measuring corporate culture.
    - Innovation, integrity, quality, respect, and teamwork are the most often mentioned values.

Summary of Findings:

- Introduce word embedding model (Word2Vec), Novel semi-supervised ML algorithm to quantify text in 209,480 earnings calls.
- Train a neural network model to learn meanings of all words and phrases in earnings call transcripts.
- Construct a culture dictionary of words which appear in close proximity of one another the following cultural values
    - Innovation, integrity, quality, respect, teamwork
- Apply weighted frequency counts to score each of the five cultural values.
- Q&A sections of earnings calls hypothesized to be the best reflection of corporate culture given expectations top management 'walk to talk' and the independence self-promotion from legal/PR departments. Mitigate window-dressing
    - Method compared to alternative methods (entire transcript, management discussion and analysis sections etc). Q&A is best from validation exercise
- Method empirically determines the most relevant words and phrases, in association with a particular value, creating a relatively exhaustive dictionary
    - Lower weights on more frequently occurring words to account for 'stated' values
    - Remove emotion-laden paragraphs prior to scoring
- Scores validated on well-established markers for corporate innovation, integrity, product quality, respect and teamwork, finding positive and statistically significant correlations.
- Explore implications of having a strong corporate culture on business outcomes, finding strong culture associated with:
    - Greater operational efficiency, More corporate risk-taking, Less earnings management, executive compensation design fostering risk-taking and long-term orientation, and high firm value (The validity of these findings is questionable given the analysis).
- After analysing M&A deals, firm's scoring higher on the following cultural values lead to:
        - Innovation and Respect: More likely to be acquirers
        - Integrity and Quality: Less likely to be acquirers
        - Closer in cultural values more likely to do a deal together
        - Post-merger acquirers cultural values positively associated with target firms pre-cultural values, after controlling for matching cultures between acquirers and targets, showing M&A does shape M&A
- Show an innovative culture is broader than the usual measures of corporate innovations (R&D, Number of patents) and corporate culture corroborates with business outcomes in all possible dimensions.

Summary of Tables:

- **Table 1: Sample**
    - Explains the derivation of 62,664 firm observations through matching process between Thompson-Reuters & CRSP Compustat.
- **Table 2: Culture Dictionary**
    - Panels A and B list the 30 most representative words and frequency of words in document (informative purposes)
    - There are words in the respect (Talented, Talent) and Quality (dedicated) you would not expect, showing power of the algorithm.
- **Table 3: Overview of sample**
    - Panel A – Summary statistics of values combined with total asset, leverage, ROA, Sales growth, Top-5 institutions. Innovation most frequently mentioned, integrity least frequently mentioned.
    - Panel B (Important) – Autocorrelations of values lagged t-1 to t-5 years. Negative autocorrelations by t-5 i.e., integrity, quality implies values do not correlate to values from five years ago. Odd.
    - Panel C (Important) – All cultural values have statistically significant, negative correlations with leverage, firm-size, and ROA. Sales growth and Top-five institutions negative with integrity and teamwork. Again, Odd.
- **Figure 1: Cultural Values across 12 Fama-French Industries (Important)**
    - Increase in cultural values attributable to industry and year effects alone. Footnote 16 confirms this major weaknesses in the paper.
- **Table 4: Top/bottom five S&P-500 companies over time (Panel A: 01-06, Panel B: 07-12, Panel C: 13-18)**
    - Simply shows firms transition in and out to the top and bottom five over time.
- **Table 5: Validation of Corporate Values (Important)**
    - Panels A-E show OLS or Probit regressions of traditional variables/measures for corporate values i.e., R&D spending for innovation accounting for size, ROA, Industry and year fixed affects in the third regression.

- The additional explanatory power reported in the incremental r-square is near zero and immaterial, confirming the major weakness reported in Figure 1. This is consistent across all five cultural values.

- **Table 6: Alternative Validation Measures**
  - Assesses different validation measures to explore above weaknesses. The results are thematically similar to Table 5 but worse.
- **Table 7: Implications of Strong Corporate Culture (Important)**
  - Strong corporate culture is an indicator which takes the value of 1 if the entity if all corporate values in the top quartile, zero otherwise.
  - Panel A shows implications via OLS regression of lagged strong corporate culture from (t-1),(t-3), (t-5) for a business outcome at time, t.
    - The variable to emphasise is Tobin Q (Overall measure for business performance (market value/asset replacement cost)
    - All three lagged strong cultures, after accounting for firm-level controls, industry, and year fixed effect, contribute 0.05 to the ratio, statistically significant but not economically significant, raising questions about contributions to business outcomes.
  - Panel B examines the implications of having a strong culture in bad times for financial firm in the financial crisis and oil firms during the BP oil spill with the second regression accounting for firm-level controls, FF3 factor loadings, year and firm fixed effects.
    - There is no statistically significant results for abnormal returns for the finance and oil firms with strong culture performing well in times of prosperity which is a red flag.
    - There is statistically significant evidence strong culture generates positive abnormal returns in times of crisis, but the above finding leads to questioning of this findings validity.
- **Table 8: M&A**
  - The Cultural Fit Hypothesis follows the line of thinking difference in firm pairs are a key determinant of deal incidence e.g., expect similar cultures to merge (culture similarity)
  - Acculturation hypothesis predicts firms with different cultures will develop a jointly different culture (culture difference)
  - Panel A: Acquisitiveness assessing the probability of being an acquirer based on cultural value
    - Linear and clogit probability models to predict likelihood of making an acquisition, focusing on matched industry and size.
    - High innovation/respect and integrity/quality more and less likely to be acquirers, respectively. However, very low explainatory power in r-squared.
  - Panel B: Cultural fit and merger-pairing via Clogit
    - Cultural similarity/difference examines the relation between cultural fit and acquirer-target firm pairing (binary;1,0), estimated from 594 completed deals. Focus on column 2 matching firms based on industry and size.
    - Statistically significant result where similar firms more likely to do a deal (cultural similarity ~4.2) rather than different (cultural difference = ~-0.5)
  - Panel C: Post-Merger Acculturation via matching culture of combined firm with pre-merger firms using OLS regression
  - Acculturation of the entity (acquirer and target values) after deal completion, using OLS regressions, for one and three years after the deal, without engaging in another significant deal, using 492 and 335 completed deals, respectively. Target-specific values regressed on acquirer values in the year prior to deal announcement
    - Results are suggestive at best providing the inference an post-acquisition acquirers cultural values related to both pre-merger acquirer's and target's values

Methodologies:

- Data: Earnings Call Transcripts, M&A deals, CRSP Compustat
  - 209, 480 Q&A earnings call transcripts (2001 -2018) from Thompson-Reuters' Street Events.
  - Obtain cultural values for 7,501 unique firms for 62,664 firm-year observations
  - M&A: examine ~8000 deals from 2003 – 2018
  - Match meta data from Thompson-Reuter's Street Events with CRSP Compustat data for business outcomes.
- Stanford Core NLP (Natural Language Processing) Algorithm
  - Segment documents into sentences and words, lemmatising to base forms (one document text file)
  - Use Named Entity Recognition (NER) to replace named entities (collocations play crucial information gathering for corporate disclosures)
  - Use two-step process to extract general and corpus-specific phrases
    - Dependency parcer in the Core NLP package to identify fixed multi-word expressions and compound words
    - Phaser module of gensim library to find two-three word phrases specific to corpus
- Word2vec Embedding
  - Theory
    - Machine learning alternative provides practical, cost-effective method to access corporate culture in rich, nuanced, technologically developing language, testing many possible combinations of neighbouring words using a Neural Network.
      - Learning progresses via backpropagation to continuously improve prediction.
    - Represents semantics (meaning of a word) as a numerical vector, determining relationships between words using a simple algorithm as words co-occur with neighbouring words have similar meanings.

        - Use a cosine-similarity with neighbouring words to measure similarity between combinations of neighbouring words.
        - Neighbouring words defined if no further than five words apart in a sentence, omitting words that appear fewer than five times in the corpus (language resource consisting of a large and structured set of texts).
    - Measurement of Corporate Culture
        - Select seed words (based on five most common cultural values) using two criteria:
            - Word or phrase is in the transcripts
            - Particular word is unambiguously culture related i.e., growth and diversity are excluded as relate to performance and diversification strategy, respectively.
        - Generate culture dictionary with top 500 words based on consine similarity associated with each of the five S&P500 values.
        - After auto-generation, remove words which should be excluded by manual inspection
    - Scoring
        - Measure each of the five cultural values at the firm-fiscal level by weighted count of the number of words associated with each value divided by the total number of words in the document.
        - The weight is tf.idf. Term frequency (tf) is the word frequency. Inverse document frequency (idf) denotes inverse frequency of documents with the word in the corpos. **Accounts for both importance of word in document and significance of word in the corpus.**
- Validation variables for Innovation, Integrity, Teamwork, Quality and Respect
    - Traditional measures e.g., Ln (# or Patents), R&D expenditure, backdating etc assessed against corporate value scores.
    - OLS and Probit regressions.
- M&A acquisitiveness, similarity, post-merger acculturation
    - Linear probability model and clogit probability models for acquisitiveness and similarity.
    - OLS regression for post-merger acculturation.

Difficulties/Interesting Points:

- The key contributions are the methodologies, mainly the ML applications to measure corporate culture.
- Article does not explore any particular hypothesis associated with business outcomes.
- A major weakness in the paper is increases in cultural values may be attributable to industry and fixed effects alone shown in figure 1, confirmed by footnote 16, and incremental R-squared measures across traditional measures of innovation, teamwork etc. in Table 5.

Erel, I., Stern, L. H., Tan, C., & Weisbach, M. S. (2021). Selecting directors using machine learning. The Review of Financial Studies, 34(7), 3226-3264.

Research Question(s):

- Can algorithms assist firms in their decisions on nominating corporate directors?
- I.e. can machine learning techniques help firms pick better directors?

Summary of Findings:

- XGBoost and Lasso ML algorithms can predict directors who will perform poorly and those who will perform well
- XGBoost and Lasso ML algorithms both outperform OLS regression as a prediction method
- Predictably bad directors are more likely to be male, accumulate more directorships, and have larger networks than the directors the algorithm would recommend in their place
- Companies with weaker governance structures are more likely to nominate bad directors
- ML algorithms can be further developed and have significant potential to help firms improve their governance and pick better directors

Summary of Tables:

- **Table 1: Summary statistics for director performance measures**
    - No time series trends appear to be present
    - Average 94.8% votes
    - 12% receives less than 90% support
    - 10.8% leave within 2 years
- **Table 2: Average fraction of poor outcomes**
    - Director-wise - males, busy (3+ boards), large networks and old have a larger fraction of poor outcomes (these are individual effects and cannot be applied simply with interaction)
    - Board-wise – more male, larger and dwindling boards have a larger fraction of poor outcomes
- **Table 3: Using OLS versus machine learning to predict director performance**
    - XGBoost and Lasso have the largest differential between top and bottom percentiles of director performance à good absolute predictive power
    - OLS has almost no differential à bad absolute predictive power
    - Ridge and Neural Network have good, but not as good differentials
- **Table 4: Evaluating the predictions using quasi-labels**
    - XGBoost and Lasso have the largest differential between top and bottom percentiles of director performance à good relative predictive power
    - OLS has almost no differential à bad relative predictive power

    - Ridge and Neural Network have good, but not as good differentials
- **Table 5: Cumulative abnormal returns around appointment announcements**
    - (-1,+1) window used around directorship announcements
    - -1.94% mean abnormal return for decile 1 predicted performance directors, 0.75% mean abnormal return for decile 10
    - Market appears to agree with XGBoost model's predictions of director appointment
- **Figure 3: Mean observed dissent versus predicted Dissent**
    - Only 1.3% of directors in the bottom decile of predicted dissent faced dissent, while 24% did so in the top decile
    - Observed dissent increases with predicted dissent
- **Figure 4: Mean observed director turnover versus predicted turnover**
    - Only 2% of directors in the bottom decile of predicted turnover leave within 2 years, while 43% do so in the top decile
    - Observed turnover increases with predicted turnover
- **Table 6: Overvalued director characteristics**
    - Young, popular, academic/finance, internationally experience candidates appear to be "ideal" and their characteristics overvalued
- **Table 7: Who hires predictably bad directors?**
    - Worse corporate governance is significantly correlated with a higher likelihood of selecting predictably bad directors
    - Key characteristics from prior analyses are used as controls

Methodologies:

- **Machine learning models**
    - **Director performance measures (Y)**
        - Shareholder support (total votes or excess votes over average)
        - Dissent (<90% support is bad)
        - Turnover (<2 years is bad)
        - Abnormal returns around announcement
    - **Board and director characteristic categories (X inputs)**
        - Gender and age
        - Education
        - Experience
        - Network
- **Sample selection**
    - Sample period: 2000 to 2014
    - BoardEx: US publicly traded with average market capitalisation > $6.6b
    - ISS Voting Analytics: shareholder support
    - 41,015 new independent directors
      4,887 unique corporate boards
      24,054 appointment votes
- **Quasi-labelling**
    - Problem: selective labelling – only applicants appointed are actually observed, while their alternatives are not
    - Solution: quasi-labelling
        1. consider a sample of individuals who would have taken the directorship with high probability
        2. filter those who joined the board of a smaller neighbouring firm within 1 year of appointment (147 candidates per pool)
        3. measure the performance of these candidates
- **Relative comparison**
    1. Identify director peers
    2. Computer director percentile rank among peers
    3. Test whether tank is higher for those predicted to do better

Difficulties/Interesting Points:

- **Difficulties**
    - Quasi-labelling is not a perfect solution to the selective labelling problem, but with enough observations it should give fairly robust results
    - Algorithmic models may undervalue specialized knowledge or valuable connections, so it is not an exact science
- **SHAP Values**
    - SHAP values are a new development which allow the impact of specific factors to be measured in a machine learning model à global interpretability
    - SHAP values can also be applied to specific recommendations to better understand which factors drive the recommendation à local interpretability
- **Looking forward**
    - More complex models with richer data will achieve better performance

- Including algorithmic input to limit discretion and reliance on soft information can minimize agency problems

Week 10: Corporate Governance (HB)

Bennedsen, M., Nielsen, K. M., Pérez-González, F., & Wolfenzon, D. (2007). Inside the family firm: The role of families in succession decisions and performance. The Quarterly Journal of Economics, 122(2), 647-691.

Research Question(s):

- Do family characteristics affect CEO appointment decisions and corporate decisions?
- What is the isolated causal effect of family CEOs on firm performance?
  - What is the impact of family CEOs on alternative measures of performance?

Summary of Findings:

- No Comment

Summary of Tables:

- *Is the gender of the first-born child a good instrument?*
  - **Table 3 page 666**
    - One concern is that the gender of the first child might have a direct effect on family characteristics, which might, in turn, be affecting performance.
    - Before succession, the firms with subsets of first-born child gender (male/female) exhibit no statistically significant underlying differences in the firm and family characteristics (this is in contrast to table 1)
    - This means we have a pretty good IV estimator: ***gender of firms born unrelated to firm performance (also unrelated to family characteristics, such as family size and number of marriages, which could impact firm performance)***
- *What does a simple difference in difference approach say about firm performance after a family CEO succession?*
  - **Table 4, page 668**
    - Panel A - ***firms underperform their industry peers before succession (by 1.62%), but outperform their industry peers after succession, but this is driven by non family-firms***; family-firms do not experience this same increase in industry adjusted OROA after a succession (they do not underperform prior to a succession on average)
    - The first difference is before and after transition and the second difference is family vs. unrelated transitions
    - Overall, family-firms experience a 1.4% decrease in OROA after succession
    - Panel B - Family-firm CEOs experience lower measures of other performance variables compared to unrelated CEOs using a simple DD approach
- *What is the causal impact of family CEO succession on firm performance?*
  - **Table 5, page 672**
    - Panel A – first-stage results indicate that the ***gender of the first child has a strong impact on firms' succession decisions.***
      - Consistent with the initial hypothesis, ***firms which have an outgoing CEO who had a male first-born are 9.6pp more likely to appoint a family CEO, than a departing CEO with a female first child***
      - We also consider the first stage regressions using 'male child dummy' and 'ratio of male children' as dependent variables
      - Adding more controls does not make the impact of male first-born statistically insignificant in determining family CEO succession
    - Panel B
      - Again, consistent with what we expect, we use the gender of the first-born as a dependent variable and note that it has a negative impact on firm performance around the time of CEO succession
      - That is, the average drop in OROA ranges from -0.8 to -1.23 percentage points (significant at 1% level)
      - This finding is robust to the inclusion of other controls, including a dummy for a male child, ratio of male children, firm age, firm size and previous year OROA
      - The authors note that while the gender of the first-born is likely to be randomly assigned, it is still possible that the timing of family vs non-family successions may differ, e.g. family firms may conduct succession when times are tough or something along those lines
  - **Table 6, page 675**
    - Regardless of which instrumental variables we use, which performance variables we use, and which controls we use, our findings remain the same, ***family CEO succession results in worse post-succession firm performance***
    - In all cases, the magnitude of the estimated coefficient is larger than the one estimated using the OLS
    - Pg. 676: The large gap between IV and OLS estimates suggests that family successions tend to occur when unobserved firm performance is expected to improve. The OLS underestimates the true differential in performance between family and unrelated CEOs.

- *Are the findings of this paper biased by the timings of CEO succession for family and non-family firms?*
    - Table 7 page 677
        - We use other performance windows to assess the impact of CEO succession on firm performance, e.g. we compare t-3 to t+3
        - ***There is no evidence of a difference in performance between family firms and non-family firms 3 year prior and after CEO succession, indicating that the timing of succession isn't what is driving the results that we are finding***
        - Column (1): indicates that performance prior to succession is not affected by the gender of the departing CEOs firstborn child, indicating that CEOs don't time their succession differently as a function of the instrument
        - Column (3): indicates that firms that undergo family transitions do not recover from the decline in performance suffered after succession.
        - Columns (4) to (5) - examine the robustness of the results by using alternative subsamples based on the departing CEOs age
        - Column (4) - normal CEO departure. Results consistent
        - Column (5) - early/late departure. Results inconsistent but weak instrument as younger CEOs less likely to have children
        - Column (6) - Death of CEO as instrument, findings remain the same
        - Column (7) - Subsample of when CEO dies in year of succession, similar economic impact of family CEOs on performance. Non-statistically significant because sample is very small. The estimated coefficient points to a decline in performance of 3.7% at the 1% level
- *Is the impact of Family CEOs different amongst different industries or within different firm subsets?*
    - ***Family CEOs tend to be costlier in fast-growing industries, as well as in industries with high relative wages or highly skilled labour forces, environments where managerial skills are presumably more valuable***
    - **Table 8 page 680**
        - Columns (1-4) - Firm characteristics, such as small or 'no board' do not explain away our findings, i.e. findings not driven by one subset of firms.
        - Columns (5-11) - findings are consistent across industries etc (proxied for by other variables as industry classifications not available for private firms)
        - Insignificant in firms in industries with high share of family CEO transitions (above median) "families may be better suited to their positions in this field" - we can't say for sure, but they don't significantly underperform
        - Unrelated CEOs are particularly valuable in industries where professional managers would be expected to matter most
        - Insignificant for firms which report R&D spending
- *How do family CEO successions impact other measures of performance other than OROA?*
    - **Table 9 page 683**
        - Columns (1) and (2) - ***Statistically significant decrease in NI/Assets, ROCE***
        - ***Statistically significant increase in likelihood of liquidation / bankruptcy***
        - Column (3) - family CEOs are unwilling to sacrifice the short-term profitability by growing its asset base in lieu of long-term profitability
        - Overall, alternative measures of performance do not provide support to the idea that family CEOs invest at higher rates or fail less frequently than unrelated CEOs. They, in contrast, ***reinforce the hypothesis that non-family CEOs are valuable for firm performance.***
- *What are the characteristics of these incoming family CEOs which make them so average?*
    - **Table 10 page 686**
        - Succession when CEO first born is a male
        - CEO:
            - Less likely to have held CEO positions before
            - Has fewer years of schooling
            - Less likely to have attended college or graduate programme
            - Less likely (not stat-sig) to have held a prior board position
        - Same findings but all statistically significant for family vs non-family successions
            - ***Ultimately this tells us that family CEOs are underqualified and less talented when compared to their counterparts, this is what in theory is driving our findings***

Methodologies:

- Sample: 5334 CEO successions between 1994 and 2002
    - Denmark sample because private firm data and births deaths & marriage info all public
- Ordinary Least Squares
- DID – p.663 describes the need for this approach
- An important drawback of the least squares DD estimates is that they are subject to endogeneity and omitted variables problems. For example, even when family and unrelated CEOs are equally competent, the DD estimator might erroneously attribute differential improvements in investment opportunities to a gap in CEO abilities. (Further reasoning is provided on pg. 664)
- IV Regression – p.650
    - We want to estimate the causal impact of family CEOs on firm performance

    - There is a possibility that firm performance and a family CEO may be determined contemporaneously by confounding factors (e.g. firms that are performing well might be more confident to pass on the CEO position within the family resulting in a correlation but not causal relationship between firm performance and family CEO succession)
    - We use the gender of the firstborn child of a CEO as an IV (p.665)
        - This variable is only related to firm performance insomuch as it is correlated with the likelihood of a family CEO (primogeniture)
        - Randomly assigned
        - Relevance criterion: Highly correlated with explanatory variable (Family CEO)
        - Exclusion Criterion: unrelated to error term (unrelated to firm performance except through correlation with family CEO)
- IV2 p.651 – Death of the departing chief executives around succession:
    - While the gender of the first child is likely to provide exogenous variation terms of the identity of incoming CEOs, the timing of successions is unlikely to be random (timing related concerns)
- Testing for differences in pre- and post-CEO transition changes in performance, fails to find significant differences in performance across groups prior to CEO transitions.
- The authors instrument for family CEOs using the death of departing chief executives around succession as an instrument.
- Deaths provide likely exogenous variation in the timing of succession, yet they might raise concerns related to the exclusion restriction. Deaths can affect firms and families through channels other than the identity of a CEO replacement.

Difficulties/Interesting Points:

- *Family firm successions in industries with high share of family firms - no significant impact*
- *Instrumental variables and IV regression analysis very well explained*

Cuñat, V., Gine, M., & Guadalupe, M. (2012). The vote is cast: The effect of corporate governance on shareholder value. The Journal of Finance, 67(5), 1943-1977.

Research Question(s):

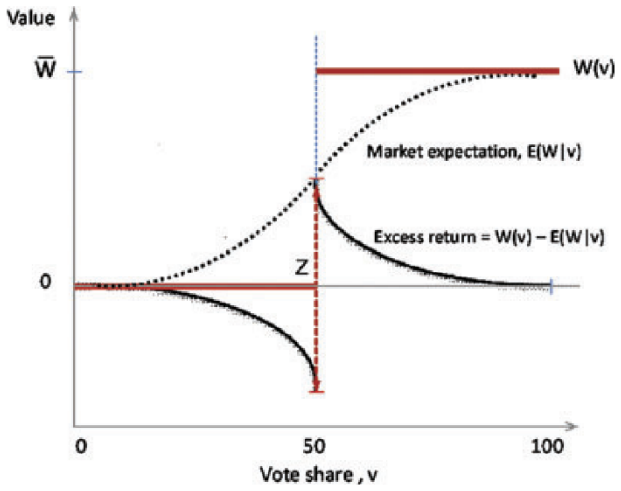
- **Question:** This paper investigates whether improvements in the firm's internal corporate governance create value for shareholders (we seek to find the causal estimates).
- **Main takeaway:** ***Creates a new study design to control for endogeneity***.
- **Motivation:** It is difficult to estimate the effect of changes in governance provisions on shareholder returns for primarily two reasons. First, ***the choice of governance structure and the type of provisions adopted by firms are arguably endogenous and correlated with other firm characteristics.*** Thus, comparing the returns of firms with different governance structures is likely to capture the effect of those unobserved characteristics rather than the effect of governance. Second, if ***investors know about the superior performance of better-governed firms, their knowledge should be incorporated into prices, and we should not observe any systematic differences in abnormal returns.***
- To consider the endogeneity problems of historical corporate governance studies the authors ***adopt a discontinuous test***. The discontinuous test looks at the abnormal return reaction to corporate governance proposals that passed or failed by a small margin (threshold). The purpose of looking at proposals that passed or failed by a small margin is that these can be seen as random events which control for the endogenity problems of historic research designs.

Summary of Findings:

- No comment

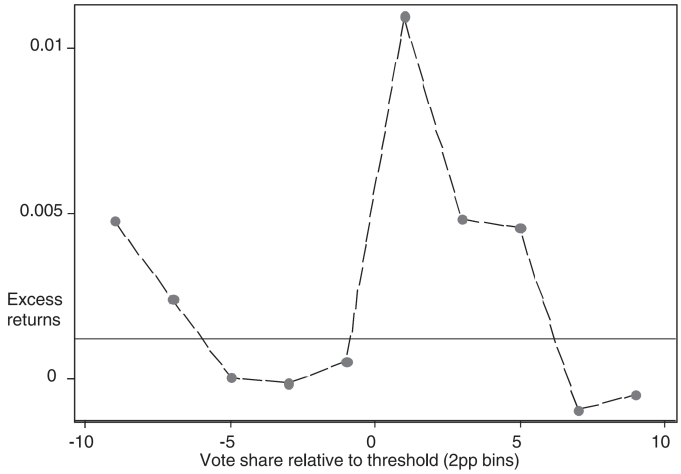
Summary of Tables:

- **3984 proposals,** broadly placed into 6 categories "antitakeover proposals (G-index), compensation, voting, auditors, board structure, and other." - Since there are a lack of observations for compensation, voting auditors, board structure and other these are grouped into one category other, resulting in two categories tested: G-index and other
- **Figure 1 -**



- W(v) is the value of the proposal
- Market expectation is the probability of passing times the value of the proposal.
- Excess return is the value of the proposal less the expected value of the proposal – The rational here is that if the probability of a proposal passing is less than one then the full value of the proposal will not be reflected in share price. Following the proposal decision prices will reflect the full value of the proposal.
- As a firm votes close to the 50% mark the market prices in 50% of the value of the total value add of the proposal passing (solid line = total value). In this research we are trying to estimate (W bar).

- **Figure 2 -**



- ***Presents that there is an abnormal return within a small margin of a pass or fail. However, this dissipates as you move further from the pass threshold***

- **Table 3 –** Looks at firm characteristics of continuous vs discontinuous votes. I.e. votes that passed by a small margin compared to the traditional research design looking at all votes that passed v failed. This table aims to show that using a discontinuous design controls for endogeneity. We can see that in columns 1 there are statistically significant results. This presents that the firm characteristics are correlated with the pass-fail decision presenting the results are endogenous. Column two controls for this using a discontinuous design. We see that there are no statistically significant results presenting this methodology controls for endogeneity.
- **Table 4 page 1962**
  - Reports estimates of the difference in abnormal return proposals that pass and proposals that do not pass for increasing intervals around the election threshold on the day of the vote
  - ***Column one shows the abnormal return for all pass-fail decisions and finds there is no significant abnormal return***. This is a result of decisions that were far from the threshold and investors had already incorporated the thought value into price
  - We see that the closer the vote was to threshold the larger the abnormal return and statistical significance.
  - Column 7 uses their full discontinuous model (correct model) finds a passing effect of 1.3% abnormal return
- **Table 5 page 1964**
  - Looks at abnormal return on the day verses time after. Finds most of the abnormal returns were on the day of the proposal passing. The find there was a further return in the period after presenting there was no reversal impact
  - Most of the effect in abnormal returns is driven by g-index (antitakeover proposals) compared to other proposals.

- **Next section** – ***First section showed that CG proposals that pass have a positive share price reaction. The second section looks at what firms are impacted the most by corporate governance proposals***
- **Table 6 page 1966:**
    - ***Find that high institutional ownership concentration, active shareholders, and proposals put forward by institutional owners as opposed to individuals have greater impacts on share price. Also find firms with more G-index provisions are more impacted by proposals***
    - Also look at firms with high R&D. Expect that firms with high R&D may be negatively impacted by pass of vote. This is found to not be the case.
    - In particular, column 1 of Table VI shows that passing a G-index shareholder proposal in concentrated-ownership firms elicits a 2.1% abnormal return on the day of the meeting, with a further cumulative return of 2.1% in the 7 days after the meeting. This suggests, with higher ownership concentration, the market is less certain of outcomes, and prices in the value of the proposal less.
    - Firms with 10 or more antitakeover proposals - once one is removed, there is precedent to remove the others, thus, higher returns (column 3)
    - High R&D firms also have similar CARs - this suggests that managers aren't foregoing long term prosperity for short term share price gains
- **Table 7 page 1969**
    - ***If a vote passes, the policy is more likely to be implemented (even though at the threshold it doesn't necessarily need to be implemented as it is non-binding)***
    - Look at whether G-index reduces in the future - looking to see whether following a vote passing the policy is implemented.
    - Find that there is an approximately 31% probability that it is adopted
- **Calculation** – Using the probability of being implemented and the known share price reaction on the day of passing they back solve the true value of the proposal and find it is 2.8%.
- **Final section** – Look at the long term value of adopted corporate governance proposal

- **Table 8 page 1972**
    - Finds a reduction in G-index results in less acquisitions, lower capex and lower long run book to market
    - This can be interpreted as reduced incentives of managers empire building reducing agency costs.

Methodologies:

- **Regression discontinuity:**
    - "We argue that a regression discontinuity design on the outcomes of shareholder proposals in annual meetings allows us to overcome the two limitations of standard regressions of stock market returns on governance provisions.
    - This empirical strategy essentially compares the stock market's reaction to shareholder-sponsored governance proposals that pass by a small margin to those that fail by a small margin. For these close-call proposals, passing is akin to an independent random event (it is "locally" exogenous) and therefore uncorrelated with firm characteristics. Intuitively, the average characteristics of a firm in which a proposal passes with 50.1% of the votes are like those of a firm in which the proposal gathers only 49.9% and fails to pass. However, this small difference in the vote share leads to a discrete change in the probability of implementing a proposal"
- **Ordinary Regression**
- **Event Study**

Difficulties/Interesting Points:

- We see that firms which pass 6 proposals on a given day "randomly" experience an 11% increase in firm value which is pretty astounding
- Hard to tell if this is solely due to underlying difference