

Workplace Inequality in the U.S.: Evidence from Pay Growth

Jie (Jack) He
University of Georgia

Lei Li
Federal Reserve Board

Tao Shu
Chinese University of Hong Kong, Shenzhen

June 2022, Global Corporate Governance Colloquium, University of Oxford

Workplace Pay-Inequality in the U.S.

- **The United States has witnessed sharply rising income inequality over the last several decades.**
 - Tremendous attention from regulators, professionals, researchers, and media.
 - Song et al. (2019): One-third of the US income inequality escalation can be attributed to the rising within-firm inequality.
 - Social “unfairness”?
 - *“If you have any doubt about our country’s disappearing middle class, check out the current CEO-to-employee pay gap” — Forbes, 2018.*
 - In August 2015, SEC required US publicly listed companies to disclose CEO-to-median-employee pay ratios on an annual basis.
- **The lack of granular US data on employee pay and within-firm pay inequality.**
 - Voluntarily-reported wages from Compustat (Faleye, Reis, and Venkateswaran, 2013) or Glassdoor (Green and Zhou, 2019)
 - International data (Mueller, Ouimet, and Simintzi, 2017)
 - Executive pay records only (Frydman and Papanikolaou, 2018).

This Paper

- **We study workplace pay inequality in the U.S. and extend the literature in two important ways.**
- **We exploit an individual-level dataset of employee pay-records from the U.S. Census Bureau.**
 - We use the Longitudinal Employer-Household Dynamics (LEHD) database to accurately measure within-firm pay inequality for US companies.
- **We examine the differential percentage growth in pay between executives and employees (i.e., “pay growth gap”).**
 - Previous studies focus on the within-firm difference in pay levels (i.e., “pay level gap”) and rationalize such inequality in an optimal contracting framework.
 - Pay growth gap, compared to pay level gap, is less affected by the talent differential between executives and employees.
 - Pay growth gap itself is an important dimension of inequality and captures “fairness”
 - News Media also pay attention to CEO pay growth: e.g., a 2019 WSJ article “*Big companies pay CEOs for good performance – and bad*”
 - Pay growth gap helps shape the evolution of pay inequality over time.

Data and Sample Construction

- **Executives' annual compensation for U.S. public firms from S&P Capital IQ.**
- **Individual employees' wages and personal characteristics from LEHD.**
 - LEHD combines the Unemployment Insurance (UI) earnings records.
 - Quarterly earnings for each employee-employer pair and individual employees' personal characteristics such as gender, age, race, and education.
 - Our LEHD sample includes 26 states (New York is the only missing major state).
 - Exclude a firm-year if our LEHD data cover less than 90% of its workforce.
- **Our final sample consists of about 4,500 firm-years between 1999 and 2008.**

Large Pay Growth Gaps

- **Pay growth measures**

- *PayGrowthExec*: For a firm-year, the average pay growth for executives (Capital IQ, Correa and Lel, 2016; Burns, Minnick, and Starks, 2017, etc.).

- *PayGrowthEmp*: For a firm-year, the average pay growth for rank-and-file employees (LEHD), after excluding top-paid executives from LEHD employees.

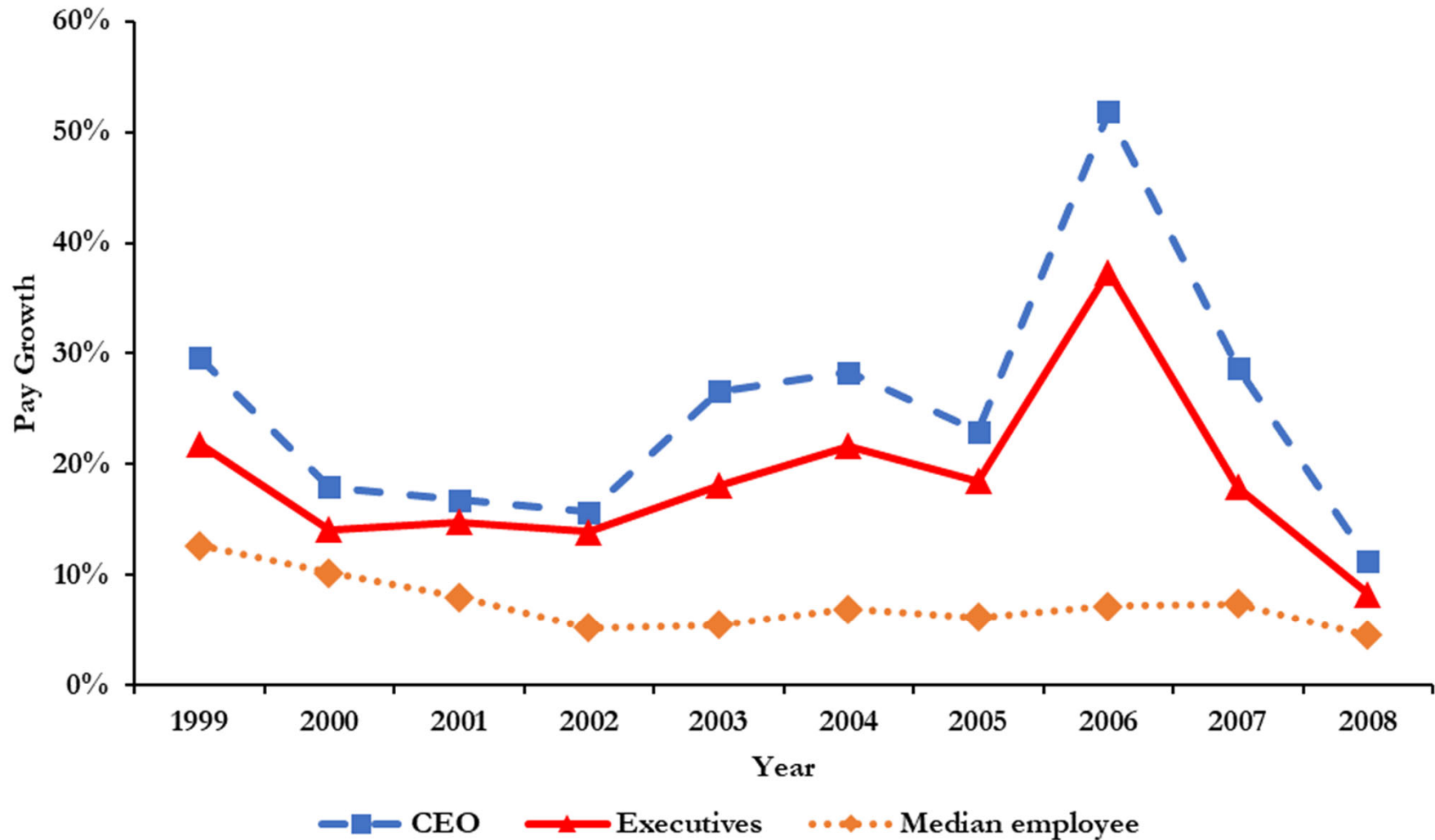
- Require each executive and employee to stay in the firm at both years.

- **Executives, despite their higher salary to start with, enjoy much larger pay growth than rank-and-file employees.**

- Average executive pay growth is **16.8%** but average employee pay growth is only **5.2%**, leading to a large pay growth gap of **11.6%**.

- One-third of the firms having pay growth gaps above 20% and around 10 percent having pay growth gaps above 50%.

Pay Growth for CEOs, Executives, and Non-Executive Employees Separately



Pay Growth Gap and Firm Performance

- The large pay growth gaps per se, however, do not necessarily indicate “unfairness”.
 - Executives, relative to rank-and-file employees, may receive higher pay growth for a greater *increase* in the level or value of their talent between two consecutive years, and in turn a greater *increase* in their contributions to firm performance.
 - If so, pay growth gaps should increase in firm performance (shareholder wealth growth), especially the performance component attributable to labor input.
- Decompose firms’ stock returns.
 - Firm-level regression of monthly returns (Daniel, Li, and Naveen, 2020)
$$TotalRet_{i,m} = \alpha_i + \beta_i IndustryRet_{j,m} + \delta_i MarketRet_m + \epsilon_{i,m}, \quad (1)$$

$FirmRet_{i,m}$ is firm i ’s return in month m ; $IndustryRet_{j,m}$ is the firm’s industry return (Fama-French 48 industries) in month m ; $MarketRet_m$ is CRSP market return in month m .
 - **IdioRet** = Estimated $(\alpha_i + \epsilon_{i,m})$, “skill return”.
 - **SysRet** = $TotalRet - IdioRet$, “luck return”.

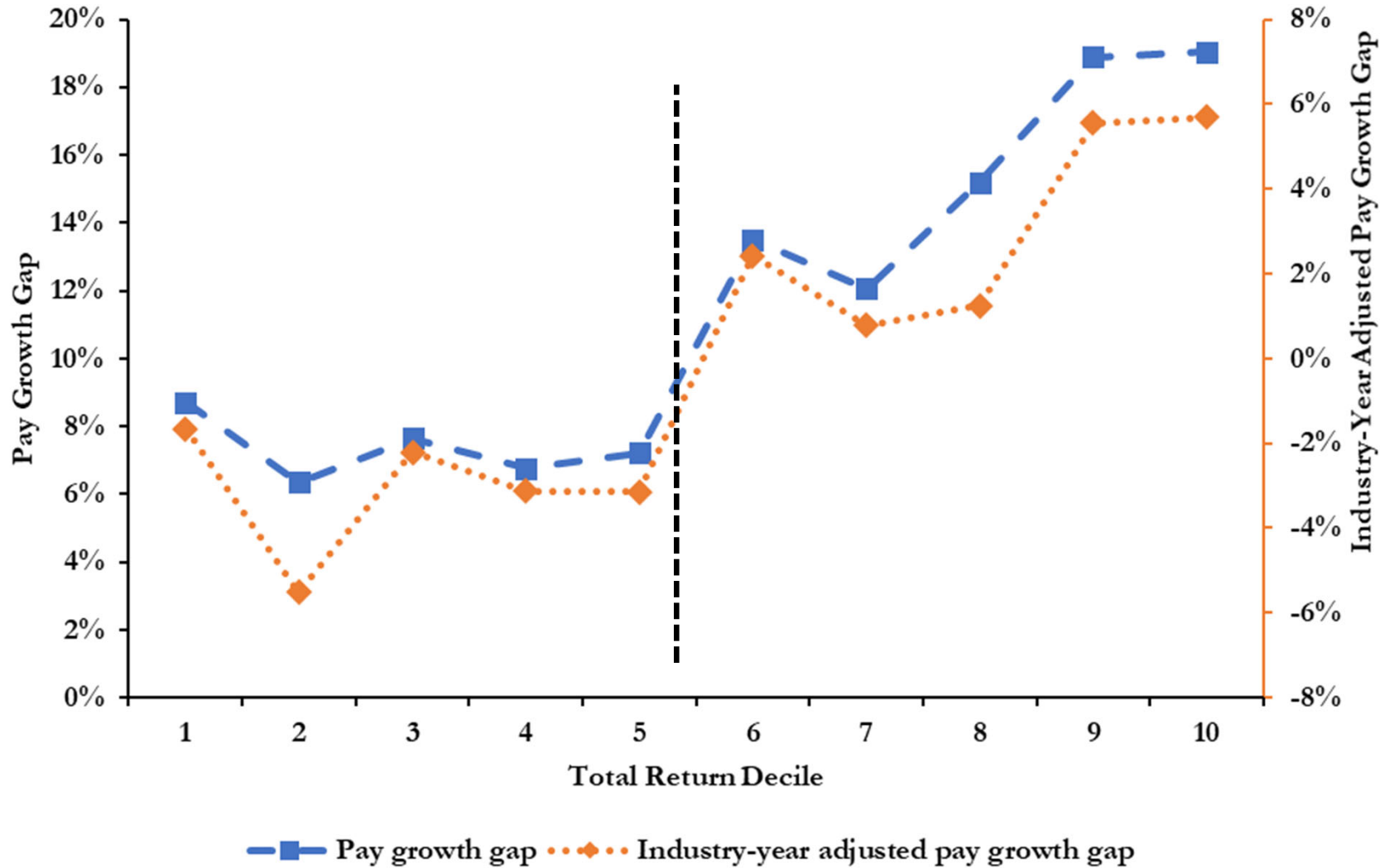
Pay Growth and Stock Performance

	Dependent Variable: <i>PayGrowth_t</i>			
	(1)	(2)	(3)	(4)
<i>DummyExec</i>	0.105*** (20.87)	0.111*** (22.38)	0.110*** (22.36)	0.105*** (21.02)
<i>TotalRet_t × DummyExec</i>	0.103*** (8.34)			
<i>IdioRet_t × DummyExec</i>		0.088*** (5.74)		0.094*** (6.16)
<i>SysRet_t × DummyExec</i>			0.120*** (6.25)	0.127*** (6.65)
Firm×Year FE	YES	YES	YES	YES
Observations	9,000	9,000	9,000	9,000
Adj. R ²	0.114	0.107	0.108	0.116

Pay Growth Gaps and Firm Performance

- **Finding 1: The pay growth gap increases in firms' idiosyncratic stock performance, which is attributable to labor input, especially executive talent/effort.**
 - This is consistent with pay-performance alignment and optimal contracting.
- **Finding 2: The pay growth gap, however, also increases in firms' systematic stock performance.**
 - Contrary to classic optimal contracting frameworks, executives seem to enjoy higher pay growth relative to employees upon higher systematic performance, which is largely independent of labor input (executives' control).
 - Can be explained by Gabaix and Landier (2008), in which the pay of CEOs, due to their scalable talent, is an increasing function of firm size (market cap) whereas the pay of lower-ranked employees does not change with firm size.

Asymmetry: Pay Growth Gap across Deciles of Total Returns



Pay Growth and Stock Performance: Regressions for Asymmetric Relation

Dependent Variable:	<i>PayGrowth_t</i>		
	(1)	(2)	(3)
<i>DummyExec</i>	0.101*** (13.40)	0.109*** (19.59)	0.094*** (12.06)
<i>IdioRetHigh_t × DummyExec (SH×D)</i>	0.114*** (4.59)		0.126*** (4.98)
<i>IdioRetLow_t × DummyExec (SL×D)</i>	0.043* (1.82)		0.042* (1.75)
<i>SysRetHigh_t × DummyExec (LH×D)</i>		0.122*** (4.57)	0.126*** (4.73)
<i>SysRetLow_t × DummyExec (LL×D)</i>		0.086*** (3.60)	0.097*** (3.95)
Firm×Year FE	YES	YES	YES
F-test for <i>SH×D= SL×D</i> (<i>p-value</i>)	3.26 (0.071)	-	4.23 (0.040)
F-test for <i>LH×D= LL×D</i> (<i>p-value</i>)	-	0.96 (0.327)	0.61 (0.434)
Observations	9,000	9,000	9,000
Adj. R ²	0.107	0.107	0.115

Asymmetry in Pay Growth Gap

- **Finding 3: Asymmetry relation between pay growth gap and firm performance.**
 - The asymmetry exists for idiosyncratic returns but not for systematic returns.
 - When performance is good, a one standard-deviation increase in idiosyncratic returns is associated with an increase of 5.6% in pay growth gaps.
 - When performance is bad, a one standard-deviation decrease in idiosyncratic returns is associated with a decrease of only 0.3% in pay growth gaps.
- **Same asymmetric pattern even if we examine only cash pay of executives.**

Robustness Tests

- **The asymmetry in pay growth gap holds in various robustness tests.**
 - Alternative approach to construct the skill and luck returns based on panel regressions of firms' returns on their industry returns (e.g., Jenter and Kanaan, 2015; Bertrand and Mullainathan, 2001; Garvey and Milbourn, 2006).
 - Alternative accounting-based performance measures: ROA, sales growth.
 - Alternative model specifications based on squared performance measures to test the asymmetry.
 - Alternative sets of fixed effects: Industry-year fixed effects; industry and year fixed effects; industry-year fixed effects and firm fixed effects.
 - Alternative employee sample that are matched to executives by gender, male, race, and education.
 - Alternative regression design with one observation per firm-year and pay growth gap on the LHS.

Alternative Performance Measures

	Dependent Variable: <i>PayGrowth_t</i>	
	(2)	(3)
<i>DummyExec</i>	0.102*** (17.69)	0.108*** (18.14)
<i>SalesGrwHigh_t</i> × <i>DummyExec</i> (PH × D)	0.186*** (3.86)	
<i>SalesGrwLow_t</i> × <i>DummyExec</i> (PL × D)	0.000 (-0.20)	
<i>ROAHigh_t</i> × <i>DummyExec</i> (PH × D)		0.149** (2.05)
<i>ROALow_t</i> × <i>DummyExec</i> (PL × D)		-0.020 (-0.84)
Firm × Year FE	YES	YES
F-test for <i>SH</i> × <i>D</i> = <i>SL</i> × <i>D</i> (<i>p</i> -value)	- -	- -
F-test for <i>LH</i> × <i>D</i> = <i>LL</i> × <i>D</i> (<i>p</i> -value)	- -	- -
F-test for <i>PH</i> × <i>D</i> = <i>PL</i> × <i>D</i> (<i>p</i> -value)	14.93 (0.000)	4.52 (0.034)
Observations	9,000	9,000
Adj. R ²	0.103	0.100

Asymmetry in Pay Growth Gap: Why?

- **Our study reveals a convex relation between firms' compensation practices and idiosyncratic stock performance**
 - Previous studies on pay asymmetry focus on CEO/executive pay levels, and either document a concave rather than a convex pay-performance relation: Leone, Wu, and Zimmerman (2006), Dechow (2006)
 - Or debate about the existence of pay asymmetry in systematic/luck returns: Garvey and Milbourn (2006), Daniel, Li, and Naveen (2020)
- **Theoretically, our finding of an asymmetry in pay growth gaps cannot be easily explained by optimal contract design.**
 - Gabaix and Landier (2008) do not predict asymmetry.
 - Implicit contract theories (e.g., Harris and Holmstrom, 1982; Holmstrom, 1983; Chaigneau and Sahuguet, 2018) cannot explain why the asymmetry only manifests in idiosyncratic performance but not systematic performance
- **Managerial power and rent extraction can be a possible explanation**
 - Without unchecked power, asymmetry may manifest mostly in idiosyncratic returns, which is a more covert practice than pay growth asymmetry in the more easily measurable systematic returns

Corporate governance: A quasi-natural experiment

- We thus examine the explanation based on managerial rent extraction.
- Exogenous worsening of firms' corporate governance arising from the state-level staggered enactments of the **Universal Demand (UD) laws in the U.S.**
 - Derivative lawsuit: One of the most effective mechanisms for shareholders to discipline managers, where shareholders can sue managers or directors for breaching fiduciary duties.
 - The threat of derivative lawsuits may lead the firm to preemptively strengthen corporate governance provisions (e.g., Appel, 2019).
 - UD laws significantly reduce the threat to managers and directors by requiring shareholders to seek board approval prior to launching a derivative lawsuit.

Asymmetry in Pay Growth Gaps: Shocks to Corporate Governance from Universal Demand Laws

Sample:	Dependent Variable: $PayGrowth_t$	
	Without UD Laws	With UD Laws
	(1)	(2)
$DummyExec$	0.104*** (10.48)	0.039* (2.14)
$IdioRetHigh_t \times DummyExec (SH \times D)$	0.106*** (6.97)	0.239*** (4.36)
$IdioRetLow_t \times DummyExec (SL \times D)$	0.055*** (2.88)	-0.037 (-0.69)
$SysRetHigh_t \times DummyExec (LH \times D)$	0.115*** (3.71)	0.187*** (3.75)
$SysRetLow_t \times DummyExec (LL \times D)$	0.101*** (4.64)	0.095* (2.15)
Firm×Year FE	YES	YES
F-test for $SH \times D = SL \times D$ (<i>p-value</i>)	4.54 (0.044)	12.41 (0.004)
F-test for $LH \times D = LL \times D$ (<i>p-value</i>)	0.08 (0.778)	2.31 (0.155)
Observations	7,600	1,400
Adj. R ²	0.112	0.140

Additional Evidence for Rent Extraction: Cross-sectional Analyses based on Analyst Coverage, Union Coverage, and Labor Productivity

Subsample:	Dependent Variable: $PayGrowth_t$					
	High <i>AnaCov</i>	Low <i>AnaCov</i>	High <i>UnionCov</i>	Low <i>UnionCov</i>	High Labor Prod.	Low Labor Prod.
	(1)	(2)	(3)	(4)	(5)	(6)
<i>DummyExec</i>	0.121*** (10.22)	0.062*** (6.32)	0.105*** (8.80)	0.083*** (8.37)	0.093*** (8.26)	0.095*** (8.70)
<i>IdioRetHigh_t × DummyExec (SH × D)</i>	0.103*** (2.78)	0.159*** (4.73)	0.143*** (3.77)	0.102*** (3.05)	0.134*** (3.42)	0.119*** (3.68)
<i>IdioRetLow_t × DummyExec (SL × D)</i>	0.086** (2.32)	-0.011 (-0.37)	0.079** (2.25)	0.011 (0.35)	0.132*** (3.65)	-0.013 (-0.41)
<i>SysRetHigh_t × DummyExec (LH × D)</i>	0.142*** (3.61)	0.084** (2.34)	0.151*** (4.01)	0.100*** (2.65)	0.213*** (5.30)	0.053 (1.50)
<i>SysRetLow_t × DummyExec (LL × D)</i>	0.104*** (2.96)	0.108*** (3.52)	0.104*** (2.89)	0.086*** (2.60)	0.084** (2.27)	0.107*** (3.20)
Firm×Year FE	YES	YES	YES	YES	YES	YES
F-test for $SH \times D = SL \times D$ (<i>p-value</i>)	0.07 (0.788)	10.78 (0.001)	1.09 (0.297)	2.93 (0.087)	0.00 (0.982)	6.20 (0.013)
F-test for $LH \times D = LL \times D$ (<i>p-value</i>)	0.45 (0.504)	0.28 (0.600)	0.72 (0.396)	0.07 (0.785)	5.01 (0.026)	1.16 (0.282)
Observations	4,800	4,200	4,500	4,500	4,500	4,500
Adj. R ²	0.110	0.121	0.132	0.097	0.132	0.100

Alternative Explanations

- **Compensation for turnover risk?**
 - Executives may face greater ex ante turnover risk relative to employees upon bad performance, so they suffer less pay cut upon poor performance if they are not fired.
- **Retain CEOs because of competitive labor market condition for executives?**
 - The asymmetry is stronger when external executive labor market condition is worse.
- **Greater room for pay raises instead of pay cuts for executives?**
 - Cannot explain why pay growth gaps respond symmetrically to systematic stock returns.
- **Firms encouraging their managers to take extra risk?**
 - Asymmetry is NOT stronger in industries that need to encourage risk taking such as innovative industries, high-tech industries, or those with greater growth potential
- **Big one-time severance package before departure upon bad performance?**
 - The results remain when we drop departing executives from the sample, i.e., require executives to work for the firm in the year after the calculation of pay growth.
- **We acknowledge that we cannot exhaustively examine all potential explanations. Rent extraction might only be one contributing factor.**

Turnover Rate and Stock Performance: Asymmetric Relation

	Dependent Variable: Turnover Rate _t		
	(1)	(2)	(3)
<i>DummyExec</i>	-0.075*** (-19.81)	-0.075*** (-19.73)	-0.056*** (-10.83)
<i>TotalRet</i> _{t-1} × <i>DummyExec</i>	0.002 (0.31)		
<i>IdioRet</i> _{t-1} × <i>DummyExec</i>		-0.001 (-0.16)	
<i>SysRet</i> _{t-1} × <i>DummyExec</i>		0.01 (0.84)	
<i>IdioRetHigh</i> _{t-1} × <i>DummyExec</i> (<i>SH</i> × <i>D</i>)			-0.054*** (-4.65)
<i>IdioRetLow</i> _{t-1} × <i>DummyExec</i> (<i>SL</i> × <i>D</i>)			0.066*** (4.36)
<i>SysRetHigh</i> _{t-1} × <i>DummyExec</i> (<i>LH</i> × <i>D</i>)			0.000 (-0.03)
<i>SysRetLow</i> _{t-1} × <i>DummyExec</i> (<i>LL</i> × <i>D</i>)			0.019 (1.01)
Firm×Year FE	YES	YES	YES
F-test for <i>SH</i> × <i>D</i> = <i>SL</i> × <i>D</i> (<i>p</i> -value)	-	-	27.28 (0.000)
F-test for <i>LH</i> × <i>D</i> = <i>LL</i> × <i>D</i> (<i>p</i> -value)	-	-	0.52 (0.471)
Observations	9,000	9,000	9,000
Adj. R ²	0.149	0.149	0.156

Conclusion

- We use granular, individual-level employee pay records of a comprehensive set of US public firms to examine within-firm pay inequality in the U.S.
- Our results offer a first look at the gap in *pay growth* along the corporate ladder, which by itself is an important dimension of pay inequality and is less sensitive to the executive-employee talent difference (a common explanation for large pay level gaps).
 - We document a previously unexplored asymmetry in pay growth gaps.
- Managerial rent extraction is one plausible driving force that affects the profit sharing between shareholders (i.e., capital contributors) and workers (i.e., labor contributors) of differential ranks.
- Policy implication: Our evidence provides partial support for the more stringent requirement of US public firms to disclose their pay practices across the corporate hierarchy (e.g., the CEO-to-median-employee pay ratio).