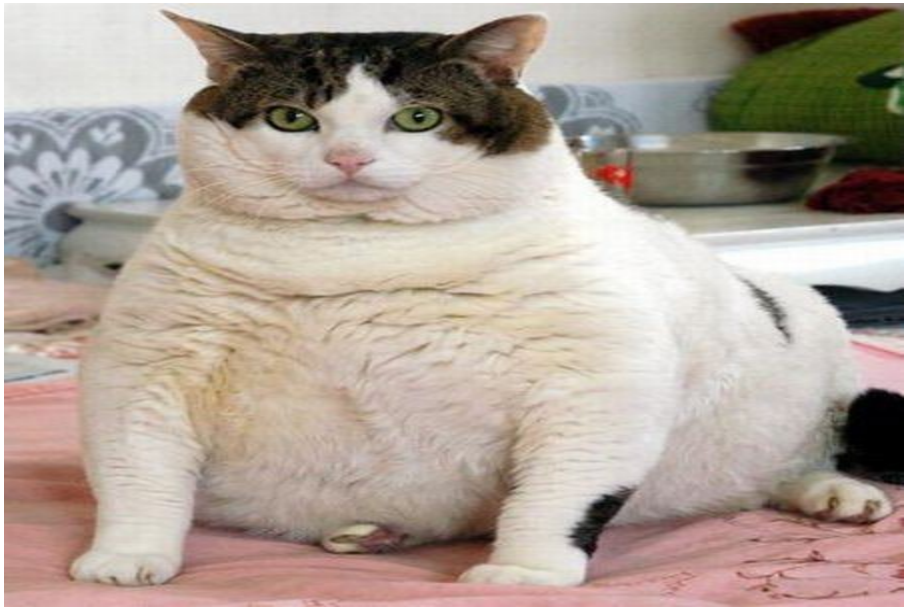
CEOs

John Van Reenen
Labor Economics, 2020



WHY SUCH INTEREST IN CEOs?

- Large increase in CEO pay relative to average worker in recent decades.
  - Facts
  - Why the increase (efficient or rents?)
  - Policy issues
- CEOs generally thought to be key agents in firm (e.g. Lucas, 1978). But
  - How much do CEOs really matter?
  - What do CEOs do?
- CEOs as key empirical application of Principal-Agent theory
- Empirical CEO Pay-performance relationship & interpretation

MOTIVATION

- Lots of discussion of inequality & especially income at the top. CEO pay often a focus of attention (e.g. Baker, 1939, QJE). ……..

EXECUTIVE COMPENSATION PAYMENTS BY LARGE AND SMALL INDUSTRIAL COMPANIES[1]

SUMMARY

The data, 404.— Definitions, 407.— Number of executives, 409.— Fluctuation in compensation, 409.— Executive compensation and earnings, 411.— Executive compensation and sales, 415.— Executive compensation, earnings and dividends, 420.— Dollar compensation of chief executives, 426. — Relationship of assets to dollar executive compensation, 428.— Bonus policies, 429.— Conclusions, 432.

Students of economics have long desired detailed statistical data showing the practices and policies followed by corporations in paying executives. The dearth of information concerning executive compensation has made the area of business profits and their division one of the least satisfactory parts of economic theory. An early study based on actual policies was made by Professor F. W. Taussig and Mr. W. S. Barker, and the findings were published in this Journal in November, 1925, under the title: "American Corporations and Their Executives." Information for this study, however, secured directly from corporations, was for the pre-war period, when the methods of paying executives, as well as the amounts paid, differed widely from current practices.

OUTLINE

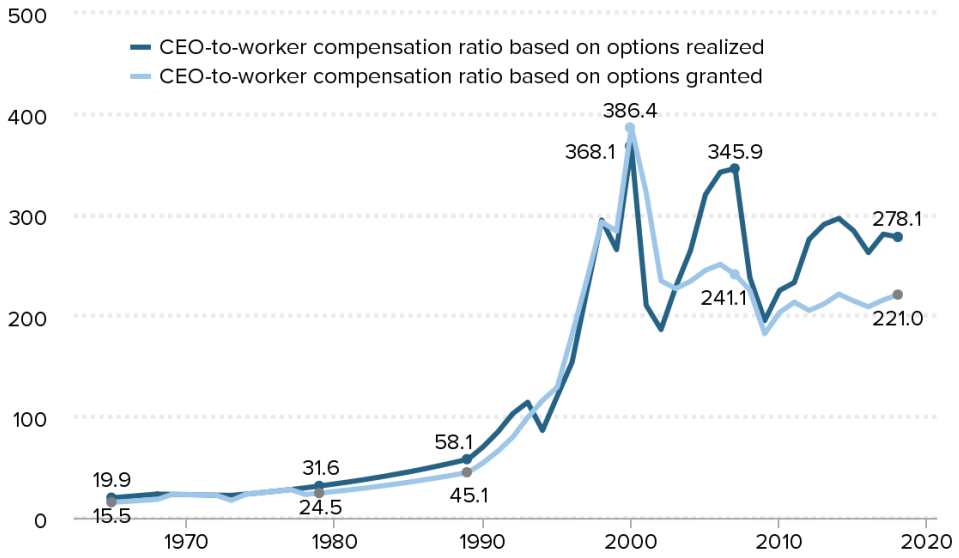
1. **Facts on CEO Pay**
2. Models & the CEO Pay-performance relationship
3. Why has CEO pay gone up so much?
4. Do CEOs matter?
5. What do CEOs Do?
6. CEO Policy?

WHAT IS EXECUTIVE COMPENSATION?

- Salary
- Bonus
- Options
- Restricted Stock
  - Note that could be conditional on performance (LTIPs)
- Non-wage compensation – Pensions; health; corporate jets, housing, etc.
- Flow vs. stock issues (new cash vs wealth)
- Ex ante vs Ex post measures

CEOs make 278 times more than typical workers

CEO-to-worker compensation ratio, 1965–2018

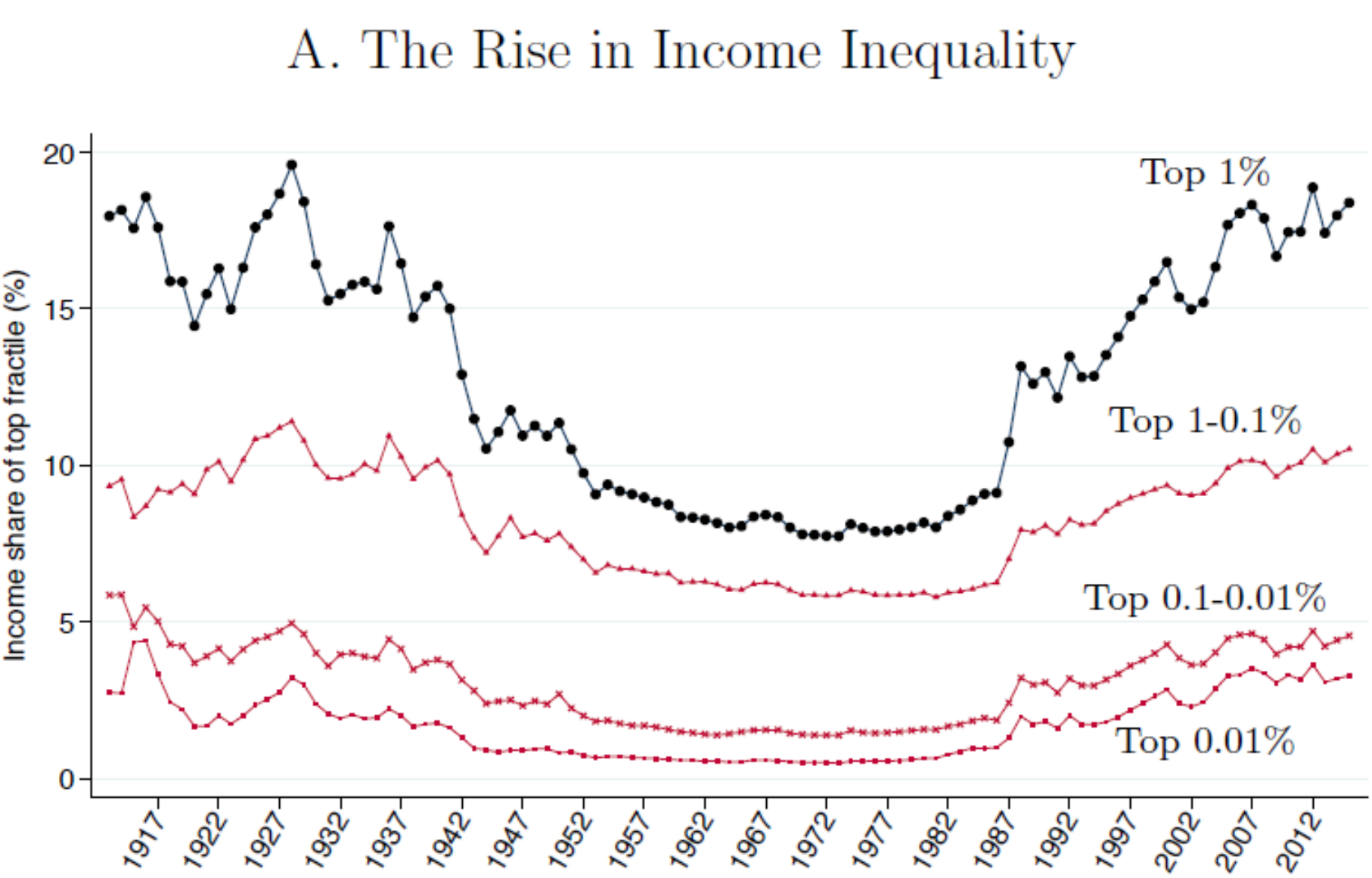


Notes: CEO average annual compensation is measured for CEOs at the top 350 U.S. firms ranked by sales. Two measures are computed, differing in the treatment of stock options: One uses "options realized," and the other uses the value of "options granted." Both series also include salary, bonus, restricted stock awards, and long-term incentive payouts for CEOs. Projected value for 2018 is based on the percent change in CEO pay in the samples available in June 2017 and in June 2018 (labeled first-half [FH] data) applied to the full-year 2017 value. Projections for compensation based on options granted and options realized are calculated separately. "Typical worker" compensation is the average annual compensation of the workers in the key industry of the firms in the sample.

Source: Authors' analysis of data from Compustat's ExecuComp database, the Bureau of Labor Statistics' Current Employment Statistics data series, and the Bureau of Economic Analysis NIPA tables

Economic Policy Institute

Notes: Average total value of CEO remuneration in top 350 US firms compared to average Production & non-supervisory worker in same industry as the firm.
http://www.epi.org/publication/ceo-and-worker-pay-in-2015/



Source: Atkinson, Piketty & Saez; High Income Database, US data

Do CEOs matter for overall income inequality?

- Bakija et al (2010); US IRS data 1979 to 2005
  - 36% of the growth of the top 1% income share accrued to households headed by a non-finance executive (not just CEO);
  - 23% of growth from to **financial-sector** households.
- In UK 2/3 of increase in share of top 1% 1997-2007 was bonuses in finance (Bell & Van Reenen, 2014)
- Smith et al (2019): US IRS data 1990-2015
  - Since 2000 all the increase in the share of top 1% due to capital income (mainly pass-through entities/S-Corps)

MUCH OF INCREASE IN CEO REMUNERATION DUE TO "INCENTIVE PAY"

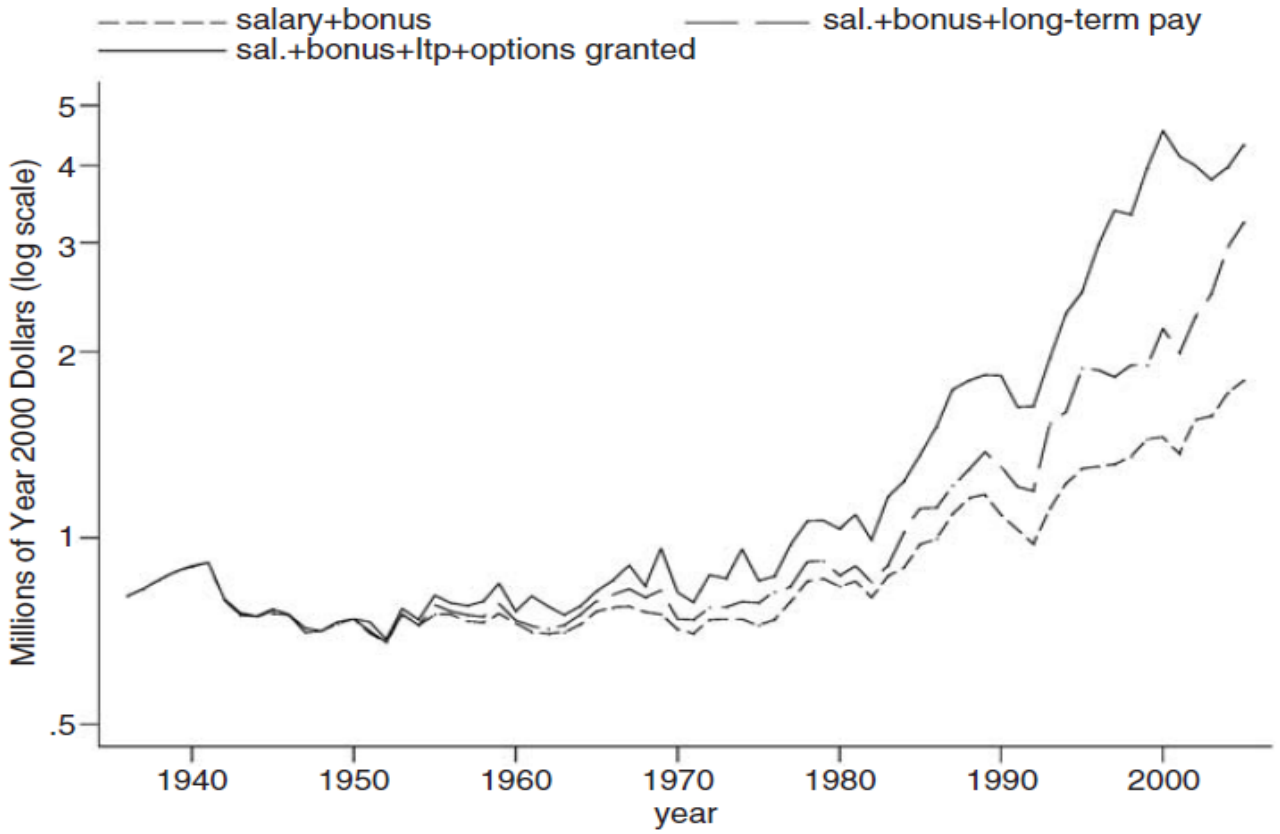
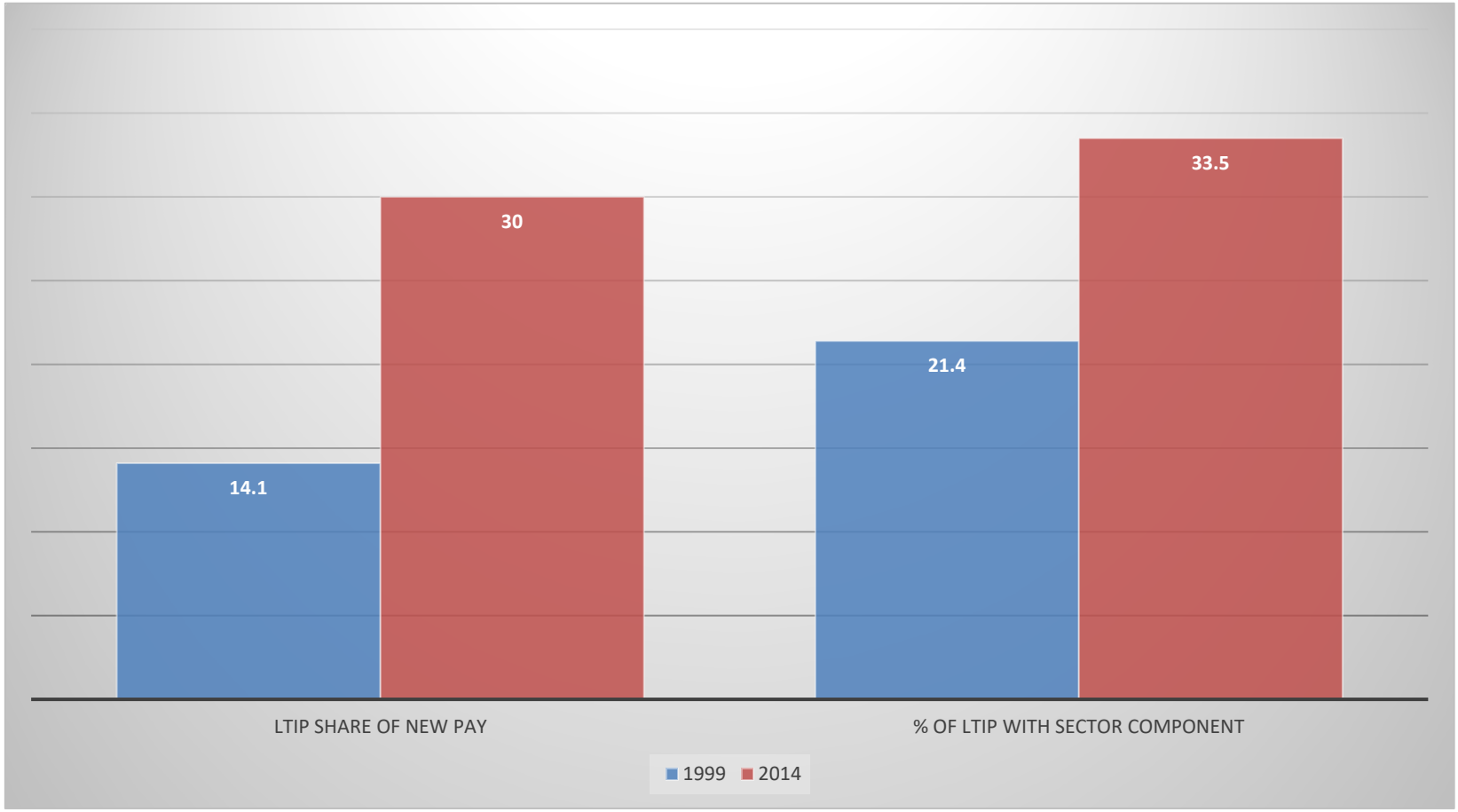


Figure 1
Median total compensation and its components, 1936–2005
Each line shows the median value of compensation defined as an increasing number of types: salary and current bonuses (paid out in stock or in cash); salary, current bonuses, and long-term incentive payments (paid out in stock or in cash); and salary, current and long-term bonuses, and the Black–Scholes value of stock options granted. Based on the three highest-paid officers in the largest fifty firms in 1940, 1960, and 1990 (a total of 101 firms).

Source: Frydman & Saks (2010)

SHARE OF CEO PAY IN LTIPS AND SHARE OF ALL LTIPS THAT HAVE A RELATIVE SECTOR COMPONENT ROSE SUBSTANTIALLY BETWEEN 1999 & 2014



Notes: LTIPS are Long-Term Incentive Plans. Sector LTIP Share shows the percentage of all LTIPs that have a sector component in the performance evaluation (i.e. are benchmarked against an industry peer average). UK data

International Comparisons

- US levels of CEO compensation higher than other OECD countries (UK closest to US)
- Bigger fraction in contingent pay
- Trend in CEO pay relative to average have increased in other countries (Boeri et el, 2013)

US FIRMS PAY MORE

Table 3.2 Summary Statistics the Level and Structure of 2008 CEO Compensation, by Country

Group	Sample Firms	Total Pay		Average Composition of Total Pay			
		Average (€000s)	Median (€000s)	Base Salary	All Bonuses	Equity Pay	Other Pay
Belgium	28	€1,328	€884	64%	20%	6%	10%
France	156	1,522	822	60%	21%	15%	4%
Germany	80	2,606	1,739	39%	42%	9%	11%
Ireland	23	2,585	1,375	54%	9%	23%	15%
Italy	46	2,717	2,183	53%	19%	13%	15%
Netherlands	60	1,526	1,166	49%	21%	17%	13%
Sweden	51	1,273	1,055	61%	16%	1%	22%
Switzerland	29	3,636	1,336	57%	17%	12%	14%
United Kingdom	419	2,016	1,183	46%	18%	28%	9%
All Europe	892	1,989	1,200	50%	21%	19%	10%
United States	1,426	3,784	2,414	29%	20%	46%	6%

Note: European data from Boardex and US data from ExecuComp exclude firms with less than €100m in 2008 revenues. CEOs in their first year are excluded. Total compensation defined as the sum of salaries, bonuses, benefits, and grant-date values for stock options, restricted stock, and performance shares. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

Source: Conyon et al (2013)

BIGGER FIRMS PAY CEO HIGHER REMUNERATION

Table 3.4 Summary Statistics for 2008 CEO Total Compensation, by Company Size

Group	Sample Firms	Total Pay		Average Composition of Total Pay			
		Average (€000s)	Median (€000s)	Base Salary	All Bonuses	Equity Pay	Other Pay
EUROPE	892	€ 1,989	€ 1,200	50%	21%	19%	10%
Firm Sales (€bil)							
Less than €.35	206	801	613	59%	15%	16%	11%
€.35 to €1.0	198	1,069	823	56%	18%	16%	10%
€1.0 to €4.0	242	1,932	1,380	46%	25%	20%	9%
Above €4.0	246	3,779	2,598	42%	22%	25%	11%
UNITED STATES	1,426	3,784	2,414	29%	20%	46%	6%
Firm Sales (€bil)							
Less than €.35	187	1,391	977	37%	19%	38%	5%
€.35 to €1.0	337	1,912	1,446	36%	19%	40%	6%
€1.0 to €4.0	491	3,319	2,716	29%	20%	46%	6%
Above €4.0	411	6,963	5,233	19%	21%	54%	6%

Note: European data from Boardex and US data from ExecuComp exclude firms with less than €100m in revenues. Total compensation defined as the sum of salaries, bonuses, benefits, and grant-date values for stock options, restricted stock, and performance shares. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919). The average (and median) results for all firms in Europe and in the United States are reported in Table 3.2.

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MODELS OF CEO INCENTIVES

- Principal-Agent models where Incentive Compatibility Constraint binds
- Market based (participation constraint binds).
- Rent extraction (Bebchuk & Fried, 2004)
  - Bargaining with Boards ("captured" Remuneration Committees)
  - Weak corporate governance
  - Matched employer-employee data show firm specific effects matter a lot for wages (e.g. Card et al, 2013, 2014a,b; Song et al, 2016). Rent-sharing general feature of labor markets? (Manning, 2013).

Is increase in CEO pay for market reasons (efficiency) or rents?

- **Incentive contracts**
- **Market based**: Reflects general returns to high skill/talent (e.g. Kaplan & Rauh, 2012)
  - Globalization; Technology (Skill Biased Technical Change)
  - Assignment Models: Increase in firm size (Gabaix & Landier, 2008; Edmans & Gabaix, 2015). “Superstar” models
- **Rent extraction**

EMPIRICAL MODEL

- Typical regression of pay (w) on firm performance (p)

$$w = \alpha + \beta p \qquad \beta = \frac{1}{1 + r\sigma^2 c''}$$

- β could be outcome of optimal contract - depends on risk aversion (r), volatility of firm performance (σ), effort function (c''), etc. (as in Holmstrom & Milgrom, 1987)

- β could represent ability of agent to extract rents from firm (e.g. a Nash bargain over the firm's value); Bertrand & Mullainathan (2001)

- Or maybe just the market value of ability (p correlated with average firm size – Lucas, 1978; Gabaix & Landier, 2008)

EMPIRICAL CEO PAY & PERFORMANCE REGRESSIONS

- Hundreds of papers (e.g. survey in Bertrand, 2009)
- Jensen & Murphy (1990, JPE)
  - Regress annual $ change in level of CEO remuneration on annual $ change in shareholder value
  - Motivated by principal-agent model, they find a statistically significant CEO pay-performance link
  - *But small in magnitude.* Argue that CEOs paid by bureaucrats due to internal firm political constraints
  - Hall & Leibman (1998, QJE) find stronger relationship using broader CEO wealth. (But these are voluntary choices made by CEO)
- Relationship has got a lot stronger over time

Is pay-performance relationship due to incentives? Issue of absence of relative performance contracts

- Performance-related pay should be relative to similar firms to partial out stochastic factors unrelated to CEO effort
  - But **options** not relative to other firms, so rise with market. (And they can be sold)

- Gibbons & Murphy (1990) look at this indirectly using industry averages & find little evidence of relative performance pay

- Formal relative performance contracts ("sector LTIPS) increasing (see Bell & Van Reenen, 2016), BUT don't seem to be effective

Is pay-performance relationship due to incentives?

- **Bertrand & Mullainathan (2001) & extensions**
  - Find CEOs "rewarded for luck"- e.g. oil executives get pay-off when oil price rises
  - Look at "lucky dollar." CEO pay rises when firm performance increases due to exogenous industry shock. Compare OLS to IV with industry performance & find similar results
  - "Lucky dollar" effect is larger when there is evidence of weak governance (e.g. no shareholder above 5% of stock)
  - Effect larger when states pass anti-takeover statutes (especially in firms with no large shareholder). Interpretation, strengthens entrenched CEOS
  - Effect asymmetric: CEO pay reacts more to increases in firm performance than decreases (Garvey & Milbourn, 2006)

Rent Extraction

- For publicly listed firms, dispersed owners do not have incentive or ability to monitor
- CEO influences Board Appointment.
  - Shivdasani & Yermack (1999) when CEOs serve on the nominating committee firms appoint fewer independent outside directors
  - Core et al. (1999) found greater CEO compensation in firms where the CEO is involved in the nomination of new directors
  - Interlocking directorships to “trade favors”
- Remuneration consultants influential on Board & often retained by CEO, not Remuneration Committee

CEO PAY & RELATIVE PERFORMANCE

- **Summary of Bell & Van Reenen (2016)**
- Close link between CEO pay & firm performance
  - Elasticity is ~0.20 (US ~0.30)
  - This elasticity gets smaller as we go down hierarchy. About 0.02 for non-managerial workers
- Some of CEO pay appears to be non-market forces:
  - Pay asymmetry (doesn't go **down** much when performance weak, but goes **up** a lot when performance strong) especially by firms with weaker governance
  - "Pay for luck" remains strong even with relative performance contracts (like sector LTIPs)
    - When CEO fails to reach relative performance benchmark negotiates "compensating" new LTIP increase (exp. when governance weak)

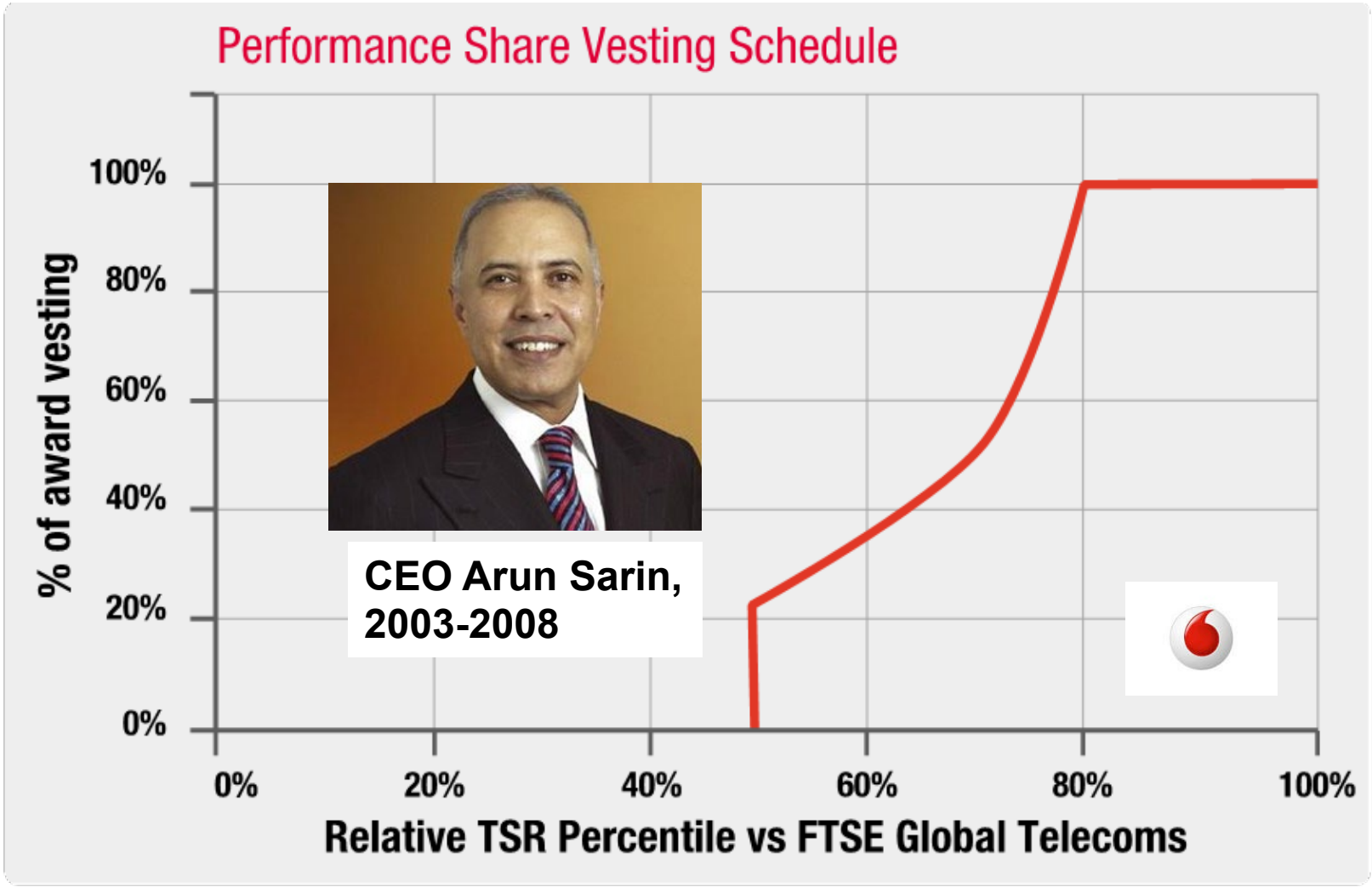
DATA (1999 to 2015)

- **Managerial compensation**
  - Mainly Boardex (like Execucomp) + own collection. Largest sample
- Publicly listed company accounts (top 300 stock market firms in each year) & shareholder returns
- 476 public firms; 1,046 CEOs; 5,683 managers; 24,301 workers; ~90% of UK stock market
  - Matched panel of firms & employees

CONSTRUCTION OF PAY VARIABLES

- **Main outcome variable: New Pay** = Cash + New Equity
- **Cash** = Salary + Bonus
- **New Equity**
  - Standard Options (valued via Black-Scholes)
  - **LTIPs (Long-Term Incentive Plans)**
    - Equity (or options) granted at a point in the future if CEO achieves an explicit & objective **performance benchmark**
    - Usually over multiple years (typically 3 years)
    - Performance usually in terms of Total Shareholder Return (TSR), but sometimes accounting measure (Earnings/Share)
    - Benchmark usually a peer group – other large firms in the same sector (**Sector LTIPs**) or market index (like FTSE-100)
    - Typically get most shares if in top quartile; a fraction if median to top quartile and zero if below median

EXAMPLE OF SECTOR LTIP FROM VODAFONE



Notes: 2005 accounts relating to 2004 LTIP award to CEO on 7/28/04. % of shares (2m = £2.4m) granted to depends on Total Shareholder Return relative to basket of 29 “peers” in FT Global Telecom index between 7/27/04 and 7/28/07. In the event 28.6% vested (Vodafone was 53rd percentile).

ASYMMETRY, GOVERNANCE & CEO PAY

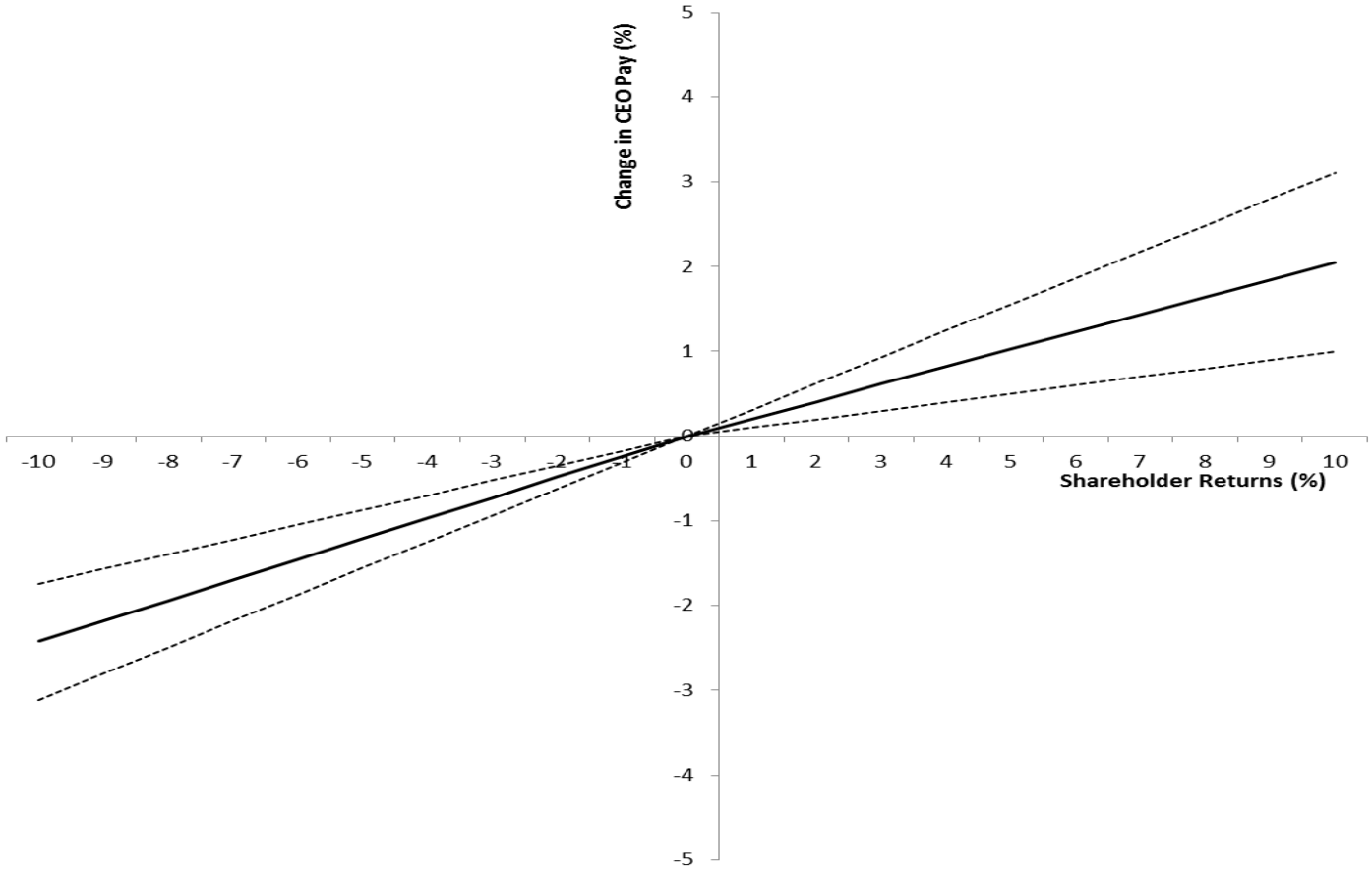
- Questions of asymmetry of rewards
  - Are CEOs rewarded more on upside (change in TSR positive, **ΔIn TSR (+)**), than on the downside (change in TSR negative)?
  - Is this asymmetry stronger when firms have governance problems? **Use two proxies:**
- Active **institutional investors** (II) like pension funds aid corporate governance (e.g. Aghion, Van Reenen & Zingales, 2013, AER)
  - II like have stronger incentives & ability to monitor than individuals
  - Split firms into "low II" (bottom quartile) vs. "high II" based on lagged II share
- Direct measure of corporate governance problems from Institutional Voting Information Service (IVIS)
  - Issue warnings (red/amber/blue) over Board votes. CEO pay most common warning

TAB 4: CEO GETS MORE ON UPSIDE WHEN GOVERNANCE WEAK

Method:	Within Groups	First Differences	First Differences	First Differences
ln TSR	**0.149**** (0.020)			
ΔIn TSR		**0.162**** (0.028)	**0.107**** (0.048)	
ΔIn TSR (+) Positive TSR growth			0.135* (0.077)	
ΔIn TSR * High II (strong governance)				**0.242**** (0.035)
ΔIn TSR(+) * High II (strong governance)				-0.037 (0.071)
ΔIn TSR * Low II (weak governance)				-0.132 (0.092)
ΔIn TSR(+) * Low II (weak governance)				**0.430**** (0.141)
# obs	5,038	5,038	5,038	5,038

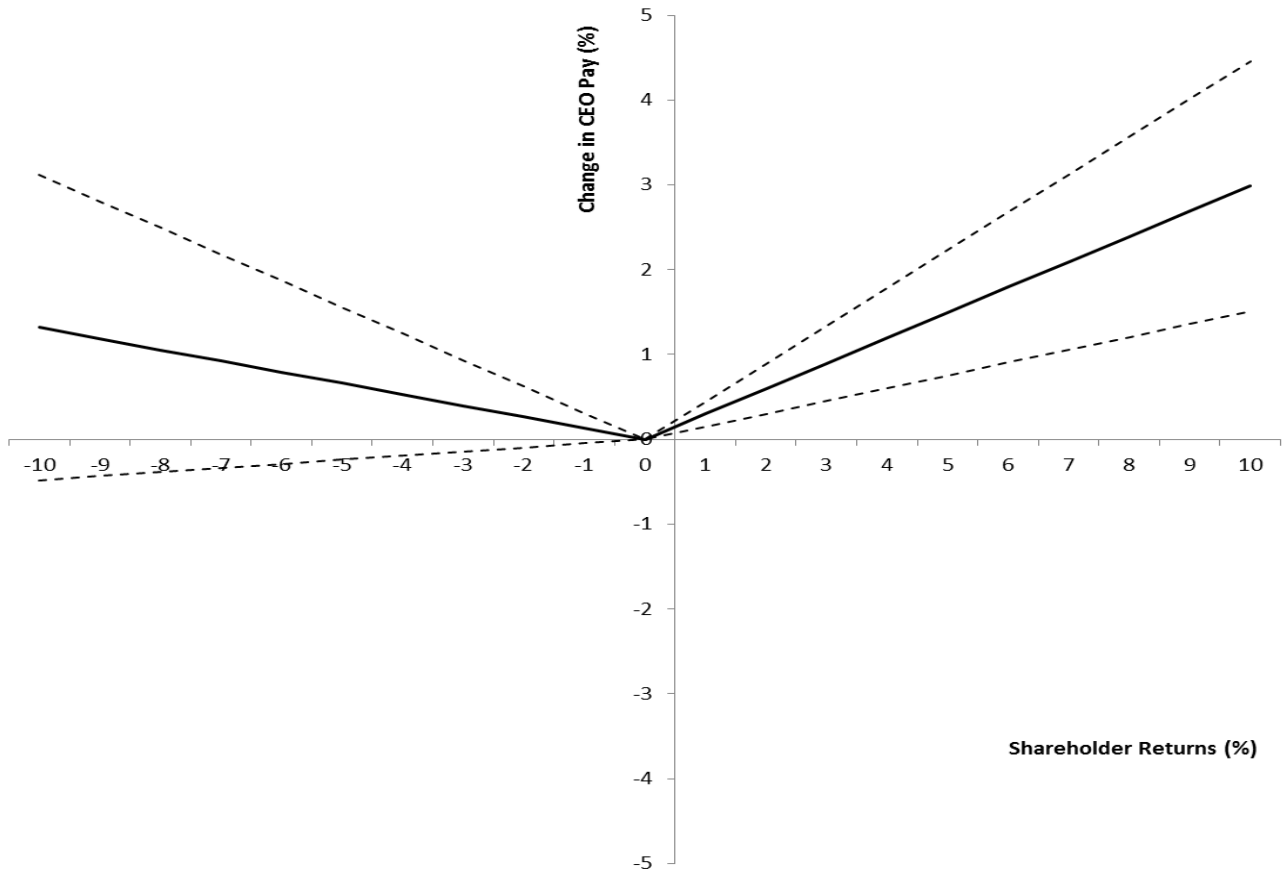
Notes: Dependent variable is Δ*ln*(New Pay). Asymmetry allowed for by including Δ*ln*TSR when positive as an additional regressor (Δ*ln*TSR+). All regressions include time dummies (interacted with II in col (1) and (2)). SE clustered at firm level. Coefficients in bold significant at the 5% level. 455 firms in col (1); 451 firms in columns (2)-(4) & 472 in column (5).

ASYMMETRY IN CEO PAY-PERFORMANCE? *SYMMETRY* FOR FIRMS WITH HIGH II (INSTITUTIONAL INVESTORS)



Notes: These are the implied marginal responses of CEO pay to changes in TSR for firms where Institutional Investors have a low (under 40%) share of equity ("II low") vs. a high share ("II high")

ASYMMETRY IN CEO PAY-PERFORMANCE? *ASYMMETRY* FOR FIRMS WITH LOW II (INSTITUTIONAL INVESTORS)



Notes: These are the implied marginal responses of CEO pay to changes in TSR for firms where Institutional Investors have a low (under 40%) share of equity ("II low") vs. a high share ("II high")

Is CEO Pay-performance all market forces?

1. Asymmetry & Governance

2. **Pay for Luck:** Find same result as Bertrand & Mullainathan (2001). IV coefficients similar to OLS implies CEOs get rewarded for exogenous industry performance shocks

3. **Sector LTIPs.** Why have sector relative performance LTIPS not dealt with asymmetry & pay for luck?
   - Plan-level analysis of CEOs subject to sector LTIPs. When performance targets failed:
     - Vesting probability & Amount of pay does fall
     - But CEOs negotiate more favorable new LTIPs

TABLE 7: CEO GET COMPENSATED IN NEW EQUITY PAY AWARDS WHEN THEIR LTIP VALUE FALLS

Dependent Variable:	Ln(New Pay)	New Equity Awards	Ln(New Pay)	New Equity Awards
Lagged LTIP Fails	-0.004 (0.015)	**40,490** (29,972)		
Lagged LTIP Fails *Low II (weak governance)			**0.070** (0.034)	**143,486** (58,023)
Lagged LTIP Fails *High II (strong governance)			-0.022 (0.017)	9,363 (34,944)
Lagged lnTSR	**0.185** (0.018)	**116,948** (51,535)	**0.187** (0.021)	**116,625** (62,363)
P-value of test that II effects are symmetric			**0.016**	**0.047**
# obs	5,070	5,070	5,070	5,070

Notes: SE clustered at firm level. Coefficients in bold significant at the 5% level. All columns include controls for CEO-firm match fixed-effects, lagged TSR and time dummies. Final two columns have interactions between II and time dummies

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What is the reason for increase in CEO pay?

- **Incentive contracts**
  - Why has this become more important?
- **Market based**
- **Rent extraction**
  - Weaker corporate governance?
  - Piketty, Saez & Stantcheva, 2014; “Compensation Bargaining elasticity”.

Market based reasons for rise in CEO Pay

- Some speculations
  - Reflects general returns to high skill/talent (e.g. Kaplan & Rauh, 2012). Globalisation or Technology
  - General has become more important than specific human capital (Murphy & Zabojnik 2004, 2006)
  - CEOs recruited externally rather than internally
  - Increasing competition from financial sector for talent

- Gabaix & Landier (2008) calibrate Lucas (1978) style model where best CEOs allocated to largest firms
  - Average firm size (market value) of largest 500 firms in the US increased by 500% 1980-2003.

Edmans and Gabaix (2016)

- Assignment model (Gabaix & Landier, 2008; Tervio, 2008)
- CEO *m* has talent (*T*) that increases firm value *V*. Talent scales with firm size like Lucas (1978). Firms denoted by *n* and *S(n)* is firm size with returns to scale γ

$$V = S(n) + CT(m)\, S(n)^{\gamma},$$

- Firm selects CEO to maximize value. CEO Firm size is assumed Pareto distributed. Firm maximizes value net of wages
- This gives a model of CEO wages (Assortative Matching)

$$w(n) = D(n_*)\, S(n_*)^{\beta/\alpha} S(n)^{\gamma-\beta/\alpha}$$

Edmans and Gabaix (2016)

- CEO wages

$$w\left(n\right)=D\left(n_{*}\right)S(n_{*})^{\beta/\alpha}S\left(n\right)^{\gamma-\beta/\alpha}$$

- Ln(Wage) = constant + (β/α)lnS(n_*) + (γ- β/α)lnS(n_*)
- CEO pay is a weighted average of the:
  - Size of the firm the CEO works for, S(n)
  - Average firm size in the economy, S(n*)
- As economy-wide average firm size grows, so does average CEO pay
- Calibration: α=1 (Zipf's law); γ=1 CRTS; β=2/3 implies pay-performance elasticity of 1/3 (which is closer to empirical estimates from US)
- Average Compustat firm size rises by factor of 6 1980-2011 and CEO pay also rises by factor of 6. q.e.d!

Critique of assignment explanation of CEO pay increases

- In 1970-1980 period CEO pay rose much more rapidly than firm size
- In pre-1970 period model also breaks down. Firm size grew in 1950s and 1960s but CEO pay stagnated
- Nagel (2008) improved data in G-L & found their model only accounts for 1/3 to ½ of increase in CEO pay
- Fit much worse using sales instead of market value
- G-L model assumes CEO talent transparent. Unclear.
- The Bertrand-Schoar (2003) evidence contradicts the assumptions of G-L (CEO effects on individual firms)
- Size not exogenous (e.g. CEO empire building)

Rent Extraction & CEO Pay trends

- Why rent extraction should have got *worse* since 1970s
  - Improvement in corporate governance? (Hermalin, 2005)
  - Declining involvement of CEOs in Board committees in 1990s (Shivdasani & Yermack, 1999)
  - Increasing product market competition
- **BUT** increase in options may be a countervailing force
  - 1994 tax laws made options more attractive ($1m limit to non-"incentive pay")
  - Accounting changes disguises true cost of options
  - Option backdating scandals (Lie, 2005, 30% of big firms)
- Norms (deregulation, declining unions & minimum wages)
- Falling marginal rates of top tax. Piketty et al (2014): when top marginal tax rates lower share of top 1% increases (cross-country) & pay for luck premiums larger (US)

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We should have covered this in earlier lectures so skip to conclusions

SUMMARY

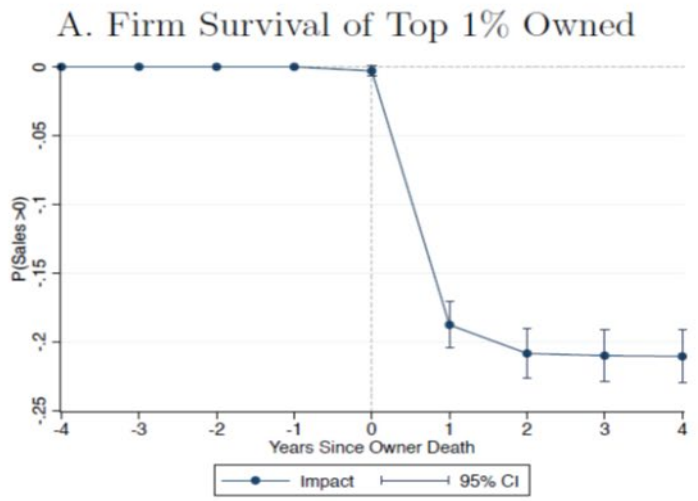
- CEOs a focus of attention for many reasons
  - Political due to inequality
  - As an arena to test contract theory
  - As key players in the determination of company performance
- Still unclear why CEO pay has increased so much in recent years
- CEOs do matter, but they are not the only determinant of firm performance or overall management practices
  - Management practices are more than just identity of top manager (Bender et al, 2018, JoLE)

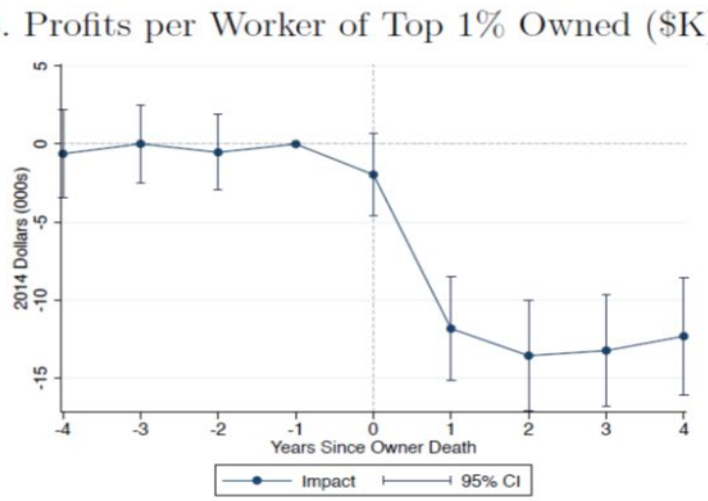
Back Up

Do CEOs matter? (Unexpected) CEO deaths

- **Johnson et al** (1985) event study positive abnormal returns after death of a founder CEO; but negative returns from non-founder
- **Bennedsen et al** (2007b) declines in profitability after CEO death. Also find that if relative of CEO takes over after death profits decline by even more (attention/effort reduction by family loss? Or ability issue)
- **Smith et al** (2017) IRS data: Firm (S-corp) performance down after premature death of owner (2509 firms of non-elderly top 1% owners)

Figure 5: Impact of Top 1% and Top 0.1% Owner Death on Firm Performance





CEO Fixed Effects (Bertrand and Schoar, 2003, QJE)

- Build a panel dataset tracking managers across S&P500 publicly traded US firms, allowing for firm and top manager fixed effects
- They find:
  1. Manager fixed effect exist, particularly for M&A, dividend policy, debt ratios and cost-cutting
  2. Managers have styles - more/less aggressive, internal/external growth focus. These correlated with CEO birth cohort & MBA
  3. Managers are also absolutely "better" or "worse" – performance fixed effects exist, linked to compensation & governance (e.g. concentrated ownership increases CEO perform FE & pay)
- Usual concern over non-random moves between jobs (see Card, Hening & Kline, 2013)

Family firms effects (Bertrand & Schoar, 2006, JEP)

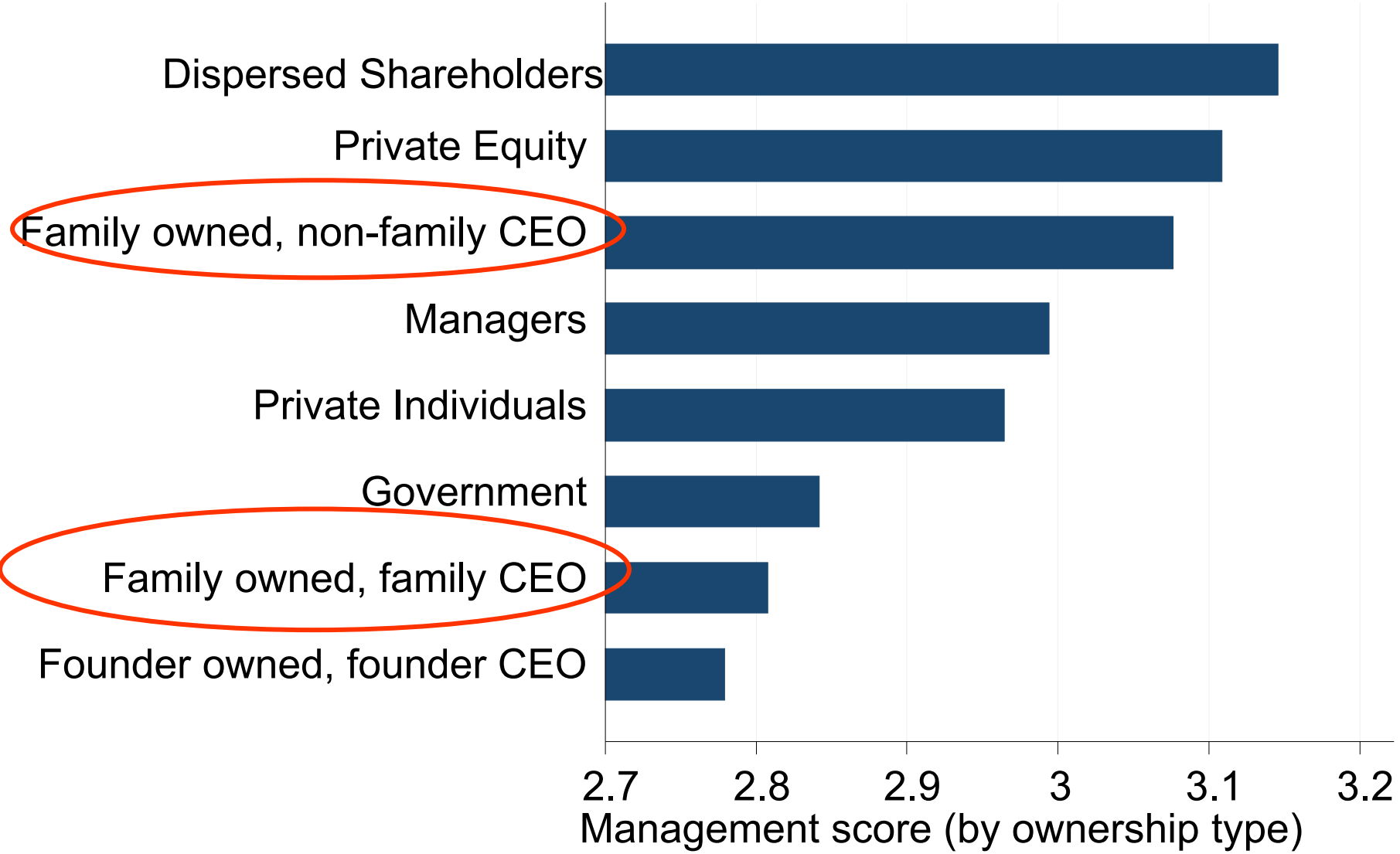
Family Ownership

- Concentration may help resolve agency issues
- But tunneling risk for minority owners

Family member as CEO (typically Primogeniture)

- *Negatives*
  - Less competition for talent (Warren Buffet on Olympics)
  - Knowing you will in inherit reduces incentives to accumulate human capital ("Carnegie" effect)
  - Non-family managers know there is no chance to make it to the top
- *Positives*
  - Occupation specific human capital
  - Overcomes problems of trust (e.g. in countries with poor contract enforcement)
  - Longer-term perspective

Family-run firms have low WMS management scores (controlling for country, industry and size)



Notes: Bloom et al (2014). Management scores after controlling for country, industry and number of employees. Data from 9085 manufacturers. "Founder owned , founder CEO" firms are those still owned and managed by their founders. "Family firms" are those owned by descendants of the founder "Dispersed shareholder" firms are those with no shareholder with more than 25% of equity, such as widely held public firms.

Perez-Gonzalez (2006, AER)

- Looks at the 335 management transitions in US publicly quoted firms (1980-2001) with **concentrated family holdings**

- Found that the *announcement* that the founding CEO will step-down leads to:
  - Big stock *rise* if the next CEO is not a family-member
  - Big stock *drop* if the next CEO is a family member, driven by the family members from "non-selective colleges" (defined as outside top 189 US Colleges)

- **Bennedsden et al** (2007a QJE) looks at family CEOs in Denmark, using gender of first born as an instrument
  - *Larger* negative impact of family CEOs in IV than OLS
  - **Because transitions to non-family members usually only happen in crisis**

How might CEOs use discretion?

- **Entrenched CEOs**
  - Empire Building (Baumol, 1959)
  - "Quiet life" (Hicks, 1932). Bertrand & Mullainathan (1999, 2003) look at passage of anti-takeover laws & find evidence of higher worker wages & lower plant creation/destruction (cf Private Equity evidence in Davis et al, 2014 AER)
  - Accounting manipulations to improve future job prospects
- **Cognitively Challenged CEOs**
  - Decision making biases. Not working against shareholders but suffering from biased beliefs
  - Over-confidence & attribution bias
  - Malmendier & Tate (2005a,b) distinguish over-confident CEOs as those who voluntarily hold "too much" stock in their own firm. Such CEOs more likely to engage in M&A.

OUTLINE

1. Facts on CEO Pay
2. Models & the CEO Pay-performance relationship
3. Why has CEO pay gone up so much?
4. Do CEOs matter?
5. **What do CEOs Do?**
6. CEO Policy

What do CEOs do?

- Surprisingly little hard information. Mintzberg (1973) shadowed 5 CEOs for a week
- Bandiera et al (2012) develop methodology for doing this. 94 CEOs of large Italian firms. Bandiera et al (2017) expands – I will focus on this paper
- 1,114 CEOs in manufacturing firms in US, UK, Germany, France, Brazil & India
- Hired a team of 40 analysts who call the CEO/his PA at the start/end of every day for 1 week
- Code all activities scheduled for that day (start) and those that effectively took place (end). e.g. Meetings; presentations
- Code all available activity features: duration, type and number of participants, location, planning horizon etc
- Record in 15 min chunks of CEO day (225k blocks over 57 hrs)

Machine Learning

- Use an algorithmic approach that projects the

High dimensional feature space onto a lower-dimensional type space: Latent Dirichlet Allocation (Blei, Ng, Jordan 2003)

0="micromanager"	1="coordinator"	likelihood ratio (1vs 0)
short (30-60m)	long (60m +)	1.17
unplanned	planned	1.17
one function	many functions	1.5
production	c-level suite	.5/10

Source: Bandiera et al (2017)

Table 3: CEO behavior and Firm Performance

	(1)	(2)	(6)
Dependent Variable	Log(sales)		Profits/Emp
CEO behavior index	0.374***	0.373***	9.836**
	(0.088)	(0.113)	(4.463)
log(employment)	0.886***	0.555***	0.089
	(0.035)	(0.053)	(0.078)
log(capital)		0.398***	
		(0.031)	
Adjusted R-squared	0.775	0.839	0.179
Number of observations (firms)	920	618	386
Observations used to compute means	2202	1415	1028
Sample	all	with k	all

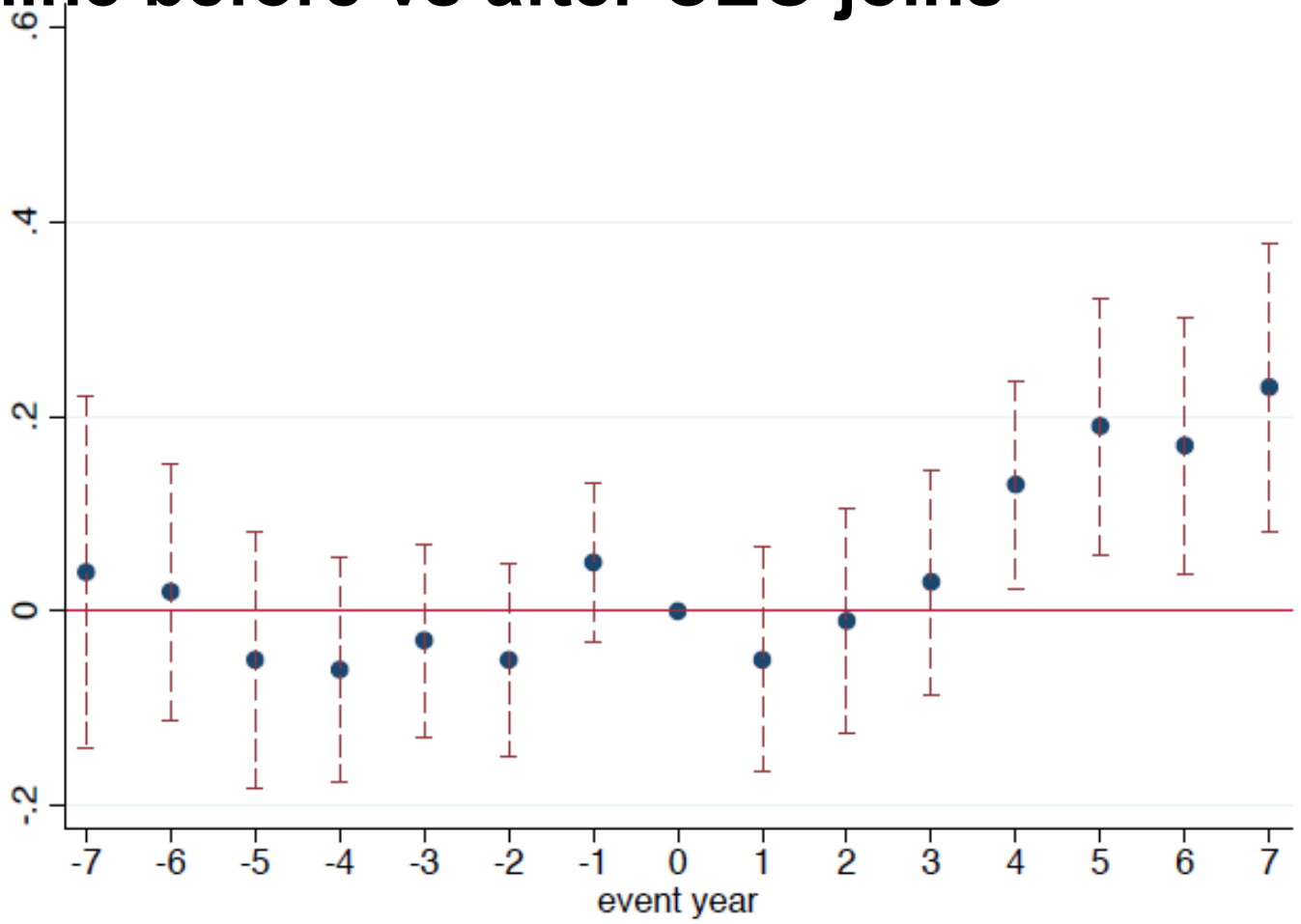
Notes: CEO index based on “co-ordinator” score.
Source: Bandiera et al (2017)

CEO index matters in magnitude

1sd increase in..	TFP increase of..
CEO index	.12
Capital	.75
management	.15

Source: Bandiera et al (2017)
Note: Management is WMS measure

Examine before vs after CEO joins



robust to different trends, different measurement lags

Source: Bandiera et al (2017)

CONCLUSIONS FROM BANDIERA ET AL (2016)

- “Co-ordinators” are in short supply, hence firms who get them do better
- Interpret as a horizontal trait. Co-ordination is not better than “micro-manager” in a vertical sense (cf. Lucas, 1978; Bloom & Van Reenen, 2007), just argue (ex post) fewer of them
  - But observationally identical? We don’t observe supply so how do we know?
  - Argues that relationship strong in developing economies: places in short supply of such managers
- Distribution of firm (& manager) types endogenous to country, etc.
- Fascinating first attempt to what managers really do

OUTLINE

1. Facts on CEP Pay
2. Models & the CEO Pay-performance relationship
3. Why has CEO pay gone up so much?
4. Do CEOs matter?
5. What do CEOs Do?
6. **CEO Policy**

SOME POLICIES OVER CEO PAY

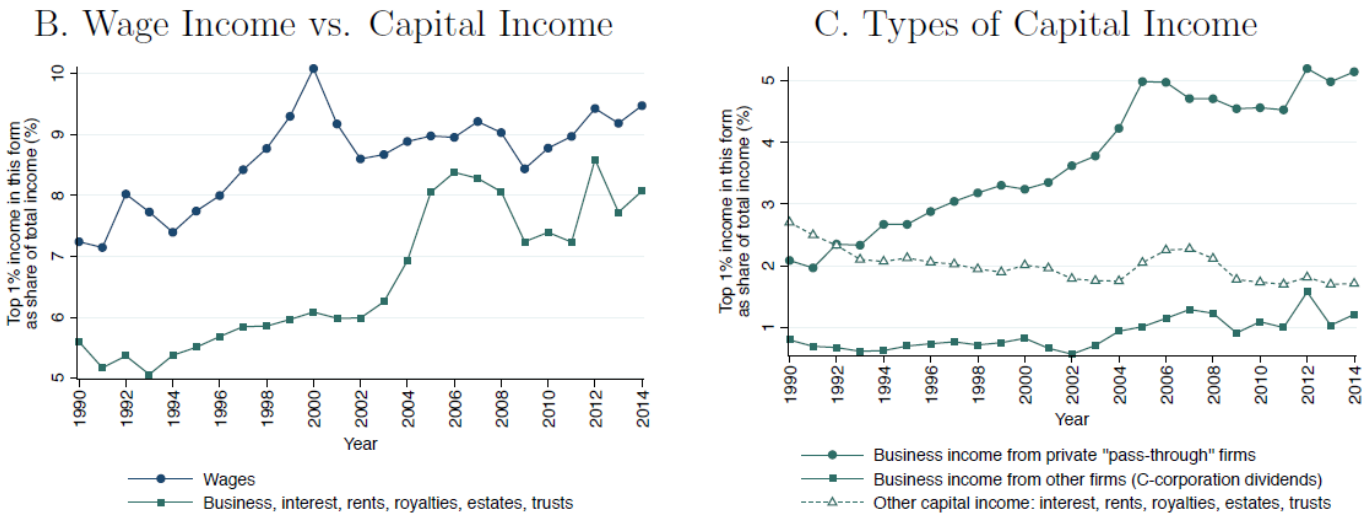
- If basically efficient then restrictions create distortions
- If concern is inequality deal with via tax system (controversy over top marginal tax rate – Piketty & Saez argue for 80%; Piketty et al, 2014 find lower top tax rates increases CEO pay without effect on growth)
- Corporate governance reforms
- “Say on Pay” – make recommendations binding rather than advisory
- Transparency – Mas (2016) on 1934 mandated pay disclosure found CEO pay rose & inequality fell
- Quantitative restrictions. In EU limit on ratio of salary to bonus in financial sector

Table 4.1 Comparison of Pay Restrictions in EESA (October 2008) and ARRA (February 2009)

	A. Limits on Pay Levels and Deductibility
Pre-EESA (IRS §162(m) (1994))	Limits deductibility of top-5 executive pay to $1,000,000, with exceptions for performance-based pay
EESA (2008)	Limits deductibility of top-5 executive pay to $500,000, with no exceptions for performance-based pay
ARRA (2009)	In addition to deductibility limits, disallows all incentive payments, except for restricted stock capped at no more than one-half base salary. No caps on salary.
	B. Golden Parachutes
Pre-EESA (IRS §280G (1986)	Tax penalties for change-in-control-related payments exceeding 3 times base pay (typically defined as average taxable income over prior 5 years)
EESA (2008)	No new severance agreements for Top 5, and no payments for top 5 executives under existing plans exceeding 3 times base pay
ARRA (2009)	No payments for Top 10 (Disallows all payments, not just "excess" payments)
	C. Clawbacks
Pre-EESA (Sarbanes-Oxley (2002))	Covers CEO and CFO of publicly traded firms following restatements
EESA (2008)	Top 5 executives, applies to public and private firms, not exclusively triggered by restatement, no limits on recovery period, covers broad material inaccuracies (not just accounting restatements)
ARRA (2009)	Covers 25 executives for all TARP participants

SUMMARY

- CEOs a focus of attention for many reasons
  - Political due to inequality
  - As an arena to test contract theory
  - As key players in the determination of company performance
- Still unclear why CEO pay has increased so much in recent years
- CEOs do matter, but they are not the only determinant of firm performance or overall management practices
  - Management practices are more than just identity of top manager (Bender et al, 2018, JoLE)



Notes: Panel A uses data from Piketty and Saez (2003) to plot the share of personal income earned by the top 1%, top 1-0.1%, top 0.1-0.01%, and top 0.01%, respectively. Panel B uses the underlying source of Panel A (see Section 2.4) to decompose the top 1% income share into two components: labor income (i.e. wages, salaries, and tips and pensions and annuities, as done in Piketty and Saez) and capital income (i.e., business income, interest, rents, royalties, estates, and trusts) since 1990. Panel C decomposes capital income into income from different business entity types: pass-through firms, C-corporations (in the form of dividends) and other capital income. These series follow the baseline approach in Piketty and Saez (2003) of plotting pre-tax income excluding capital gains. See Appendix Figure A.1 for an analogous figure for the top 0.1% and Appendix Figure A.2 for a detailed breakdown by income component for the top 1-0.1% and the top 0.1%.

Notes: Since 2000, the rise in the share of the top 1% in total income has come solely from capital income (Panel B) not labor income. Panel B shows that it is pass-through firms driving this rather than C-Corp income, etc. **Source:** Smith et al (2017)

EXAMPLE (BELL & VAN REENEN, 2016)

- Pay of employee *i* in firm *j* at time *t*

$$ln(pay)_{ijt} = \alpha_{ij} + \sum_{k=0}^{K} \beta_k \mathrm{PERF}_{\mathrm{jt-k}} + \tau_t + \varepsilon_{ijt}$$

- Show simple "impact" spec with K=0 & "long-run" K=2,etc.
- New Pay is total ex-ante expected compensation
- Firm performance (***Perf***)
  - Total Shareholder Returns (***TSR***)
  - Proxies for quasi-rents (***QRN***) ln(sales/worker) controlling for outside wage (e.g. average occupational wage in & average industry wage in worker pay equation)
- **Controls:** match-specific effects,α_{ij}; time dummies

THE MEASUREMENT OF PAY

- Newpay = Cash + New Equity (used in most regressions)
- Cash = Salary + Bonus
- New Equity = Regular Options + LTIP
- Total Pay = Cash + New Equity + Change in Old Pay
- LTIP = Expected {discounted* Pr(Vest)*Shares*price}

$$E_t\{LTIP_t\} = E_t\left\{\sum_k \phi(t,\tau)\omega_{k\tau}S_{k\tau}p_\tau\right\}$$

- Change in Old Pay $E_t\left\{\sum_k \phi(t,\tau)\omega_{k\tau}S_{k\tau}p_\tau\right\} - E_{t-1}\left\{\sum_k \phi(t-1,\tau)\omega_{k\tau}S_{k\tau}p_\tau\right\}$
- Depends on change in expectation of vesting.

$$E_{t+1}\{\omega_{k\tau}\} - E_t\{\omega_{k\tau}\}$$

- Assume this declines smoothly to final true vesting amount

% OF NEW EQUITY RELATED PAY IN REGULAR OPTIONS & LONG-TERM INCENTIVE PLANS (LTIP), UK

Notes: Bell & Van Reenen (2016). UK Boardex top 300 firms. LTIP share is % of total pay in LTIPs. Sector LTIP share is % of LTIPs that have a sector component

CEO compensation, CEO-to-worker compensation ratio, and stock prices, 1965–2015 (2015 dollars)

	CEO annual compensation (thousands)*	Worker annual compensation (thousands)		Stock market (adjusted to 2015)		CEO-to-worker compensation ratio***
		Private-sector production/nonsupervisory workers	Firms' industry**	S&P 500	Dow Jones	
1965	$832	$39.5	n/a	580	5,990	20.0
1973	$1,089	$46.3	n/a	513	4,408	22.3
1978	$1,489	$47.4	n/a	321	2,739	29.9
1989	$2,773	$45.1	n/a	596	4,635	58.7
1995	$5,873	$45.1	$52.5	837	6,954	122.6
2000	$20,406	$47.7	$55.3	1,964	14,760	376.1
2007	$18,806	$49.6	$55.4	1,689	15,065	345.3
2009	$10,584	$51.5	$57.5	1,047	9,817	195.8
2010	$12,675	$51.8	$57.8	1,239	11,597	229.7
2011	$12,880	$51.2	$57.0	1,336	12,600	235.5
2012	$15,014	$50.8	$56.4	1,424	13,385	285.3
2013	$15,727	$51.0	$56.5	1,672	15,271	303.1
2014	$16,467	$51.2	$57.5	1,934	16,799	301.9
2014 (June 2015 analysis)	$16,336	$53.3	$56.5	1,934	16,799	303.4
2015 (June 2016 analysis)	$15,502	$52.2	$58.3	2,061	17,587	275.6
Percent change						Change in ratio
1965–1978	78.9%	19.9%	n/a	-44.7%	-54.3%	9.9
1978–2000	1,270.1%	0.6%	n/a	512.7%	438.8%	346.2
2000–2015	-24.0%	9.6%	5.5%	4.9%	19.2%	-100.5
2009–2015	46.5%	1.3%	1.5%	96.8%	79.2%	79.8
1978–2015	940.9%	10.3%	n/a	542.9%	542.1%	245.7

* CEO annual compensation is computed using the "options realized" compensation series, which includes salary, bonus, restricted stock grants, options exercised, and long-term incentive payouts for CEOs at the top 350 U.S. firms ranked by sales.
** Annual compensation of the workers in the key industry of the firms in the sample
*** Based on averaging specific firm ratios and not the ratio of averages of CEO and worker compensation

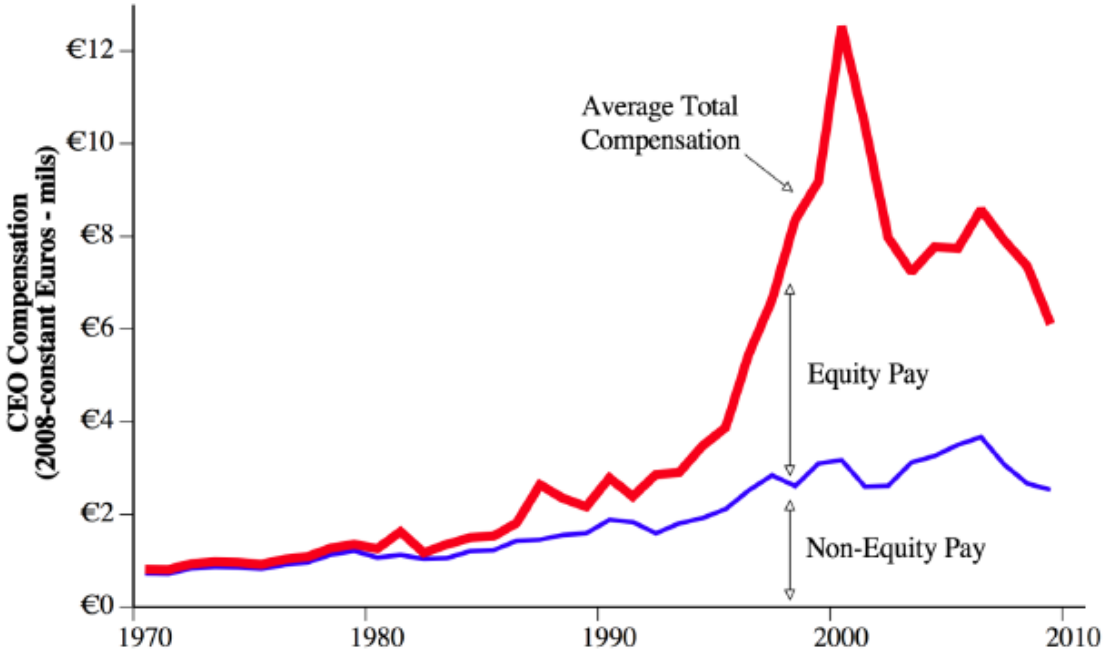
Source: Authors' analysis of data from Compustat's ExecuComp database, Federal Reserve Economic Data (FRED) from the Federal Reserve Bank of St. Louis, the Current Employment Statistics program, and the Bureau of Economic Analysis NIPA tables.

Growth of relative CEO compensation and college wages, 1979–2014

	Ratio			Log ratio		
	CEO compensation to:		College wages to:	CEO compensation to:		College wages to:
	Top 0.1% households	Top 0.1% wage earners	High school hourly wages	Top 0.1% households	Top 0.1% wage earners	High school hourly wages
1979	1.18	3.26	1.40	0.162	1.182	0.338
1989	1.14	2.63	1.57	0.127	0.966	0.454
1993	1.55	3.05	1.63	0.441	1.114	0.488
2000	2.89	7.76	1.75	1.062	2.049	0.557
2007	1.48	4.36	1.76	0.395	1.472	0.568
2010	2.03	4.85	1.77	0.710	1.578	0.574
2013	2.54	5.84	1.82	0.932	1.764	0.598
2014	2.34	5.61	1.80	0.852	1.724	0.585
Change						
1979–2007	0.31	1.10	0.36	0.23	0.29	0.23
1979–2014	1.17	2.35	0.39	0.69	0.54	0.25
1989–2014	1.21	2.98	0.22	0.72	0.76	0.13

Source: Authors' analysis of Mishel and Kimball 2015 and Piketty and Saez 2014.

Figure 2.1 Average Equity and Non-equity Compensation for CEOs in US S&P 500 Firms, 1970-2009



Note: Compensation data are based on all CEOs included in the US S&P 500, using data from *Forbes* and ExecuComp. CEO total pay includes cash pay, restricted stock, payouts from long-term pay programs and the value of stock options granted (using company fair-market valuations, when available, and otherwise using ExecuComp's modified Black-Scholes approach). Equity compensation prior to 1978 estimated as 11.2% (and 0%) of total pay (based on Murphy (1985), equity compensation from 1979 through 1991 estimated as amounts *realized* from exercising stock options during the year, rather than grant-date values. Non-equity incentive pay is based on actual payouts rather than targets, since target payouts were not available prior to 2006. Monetary amounts are converted to 2008-constant US dollars using the Consumer Price Index, and then converted to Euros using the 2008 year-end exchange rate.

Source: Conyon et al (2013)

Table 3.5 Summary Statistics for Components of 2008 CEO Pay, by Company Size

Group	Base Salary	Annual Bonus Received		Value of Option Grant		Value of Stock Grants	
	Median (€000s)	% with Bonus	Median (for >€0)	% with Grants	Median (for >€0)	% with Grants	Median (for >€0)
EUROPE	€530	70%	€382	16%	€78	47%	€467
Firm Sales (€bil)							
Less than €.35	347	60%	€163	13%	€63	40%	€212
€.35 to €1.0	429	68%	230	14%	52	41%	326
€1.0 to €4.0	571	79%	450	15%	114	50%	521
Above €4.0	965	72%	804	21%	403	54%	1,086
UNITED STATES	€557	76%	€582	49%	€1,604	72%	€1,700
Firm Sales (€bil)							
Less than €.35	330	78%	259	26%	507	44%	467
€.35 to €1.0	431	72%	358	36%	744	57%	818
€1.0 to €4.0	586	78%	636	53%	1,412	80%	1,716
Above €4.0	759	77%	1,264	66%	2,923	87%	3,502

Note: Median data for bonuses, options, and stock represent the median value of award/grant (in €000s) for the subsample of CEOs actually receiving awards/grants during the 2008 fiscal year. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

AVERAGE NEW PAY ACROSS THE FIRM

- **CEOs:**

  Total Compensation = $1,947,000

  Salary = $650k (35% of total – 2/3 is bonuses,stock, etc)

- **Level 2 (just below CEO):**

  Total Compensation = $1,088,000

  Salary = $392k (36% of total)

- **All Managers:**

  Total Compensation = $78k

  Salary = $65k (84% of total)

- **Workers:**

  Total Pay = $33k

  Salary = $31k (95% of total)

Notes: Boardex data on 897 CEOs; ASHE (23,738 workers); in 476 publicly listed UK firms (means). Using 1.65 $/£ exchange rate

TAB 2A: PERFORMANCE = TOTAL SHAREHOLDER RETURNS, lnTSR

Dependent variable: ln(New Pay)	(1) Impact	(2) Long Run Effect	#obs	#workers	#firms
Towers Watson					
CEO	**0.248** (0.055)	**0.295** (0.061)	595	163	126
Level 2	**0.173** (0.042)	**0.151** (0.040)	3,700	1,605	156
Level 3+	**0.121** (0.026)	**0.116** (0.033)	8,889	4,531	149

Notes: Bold is significant at 5%. Dependent variable is *ln*(New Pay). Column (1) has *ln*TSR as the right hand side measure of firm performance, col (2) allows for two extra lags of *ln*TSR. All regressions include worker-firm match fixed-effects, *ln(firm employment)* & time dummies. Standard errors are clustered at the firm level. Coefficients in bold are significant at the 5% level. ASHE regressions have average *ln*wage in 2 digit industry & 2 digit occupation.

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TABLE 5: EVIDENCE OF PAY FOR LUCK? INSTRUMENTING FIRM TSR WITH (EX-UK) GLOBAL INDUSTRY TSR GIVES SIMILAR RESULTS TO OLS

Dependent variable:	OLS	IV
Ln(Cash)	**0.132** (0.017)	**0.139** (0.041)
Ln(New Pay)	**0.146** (0.020)	**0.207** (0.043)
Ln(Total Pay)	**0.886** (0.071)	**1.070** (0.120)

Notes: *ln*(Total Pay) is ln(New Pay + Change in Value of LTIPs & options). *ln*TSR measure of firm performance. All regressions include CEO-firm match fixed-effects & time dummies. Standard errors clustered at the industry level (92 clusters). Coefficients in bold are significant at the 5% level. Cash is salary plus bonus. **F-Stat in first stage = 183**

TABLE 6: PLAN LEVEL ANALYSIS - SECTOR LTIPS DO REDUCE PROBABILITY OF VESTING (& AMOUNT PAID OUT) WHEN FIRM TSR RISES DUE TO INDUSTRY SHOCK

	Relative Sector LTIP		No Relative Sector LTIPS	
	OLS	IV	OLS	IV
A. Dependent variable: Vesting Percentage				
ΔLn(TSR)	**0.233****	0.077*	**0.160****	**0.169****
	(0.023)	(0.041)	(0.018)	(0.040)

Notes: Standard errors are clustered at the firm level. Coefficients in bold are significant at the 10% level. Long differences between grant date and potential vest date (usually 3 years). 1038 observations in columns (1) and (2) and 932 observations in columns (3) and (4)

TABLE 6: PLAN LEVEL ANALYSIS - SECTOR LTIPS DO REDUCE PROBABILITY OF VESTING (& AMOUNT PAID OUT) WHEN PERFORMANCE IS POOR (3 YEAR DIFF OF TSR)

	Relative Sector LTIP		No Relative Sector LTIPS	
	OLS	**IV**	**OLS**	**IV**
A. Dependent variable: Vesting Percentage				
ΔLn(TSR)	**0.233** (0.023)	0.077 (0.041)	**0.160** (0.018)	**0.169** (0.040)
B. Dependent variable: Change in value of LTIP pay				
ΔLn(TSR)	**535.98**** (27.07)	**388.29**** (64.71)	**449.45**** (36.25)	**493.02**** (102.71)
Observations	2,054	2,054	3,780	3,780
First stage F		59		36

Notes: Standard errors are clustered at the industry level. Coefficients in bold are significant at the 5% level. Long differences between grant date and potential vest date (usually 3 years)

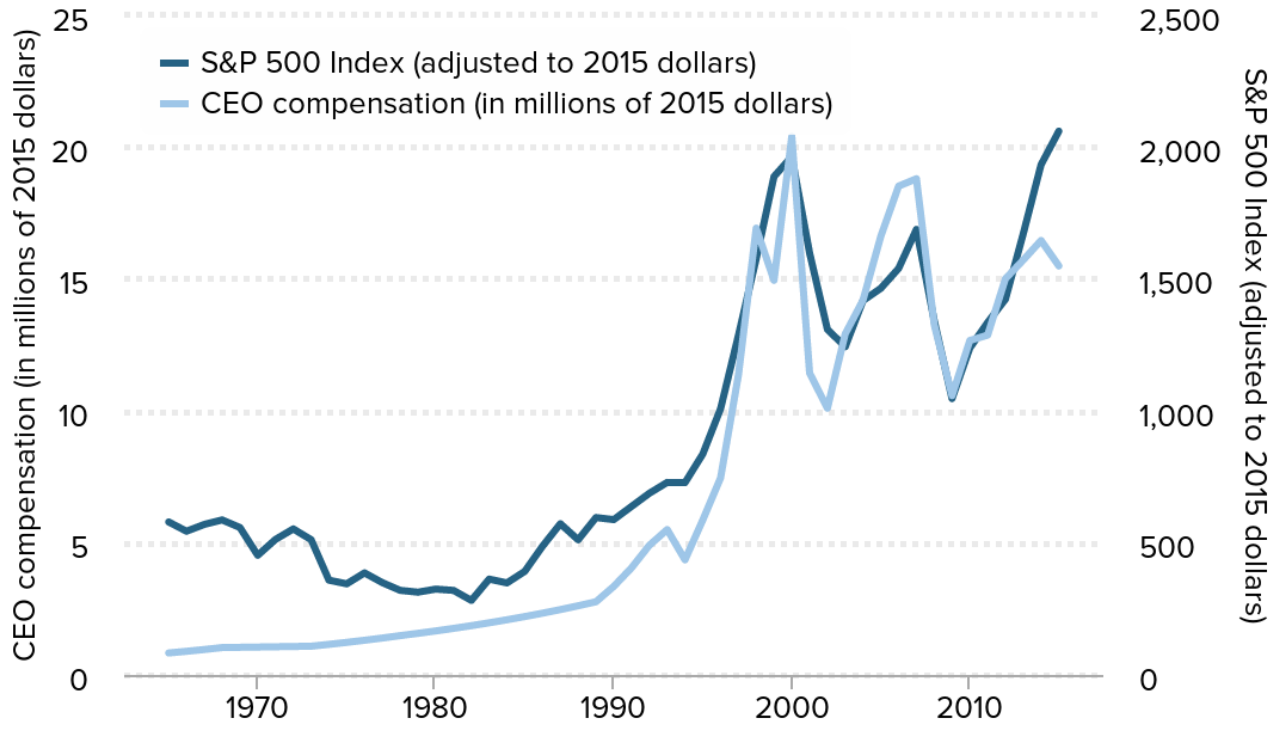
Econometric model

- Estimate a “two way” fixed effect model,

- $y_{ijt} = \theta_i + \vartheta_j + \mu_t + \pi x_{ijt} + e_{ijt}$

- y_{ijt} are different outcomes in the firm j that CEO works for at time t such as profitability; leverage; M&A activity; remuneration
- θ_i are CEO fixed effects identified from switchers across firms
- ϑ_j are firm fixed effects; x_{ijt} are time-varying CEO characteristics and time varying firm characteristics
- Note: models of this sort with wages as outcome estimated by Abowd, Kramarz & Margolis (1999) and many others. Proxy for productivity. CEOs plausibly have big effect on performance, much more so than a single worker.

CEO compensation and the S&P 500 Index (in 2015 dollars), 1965–2015

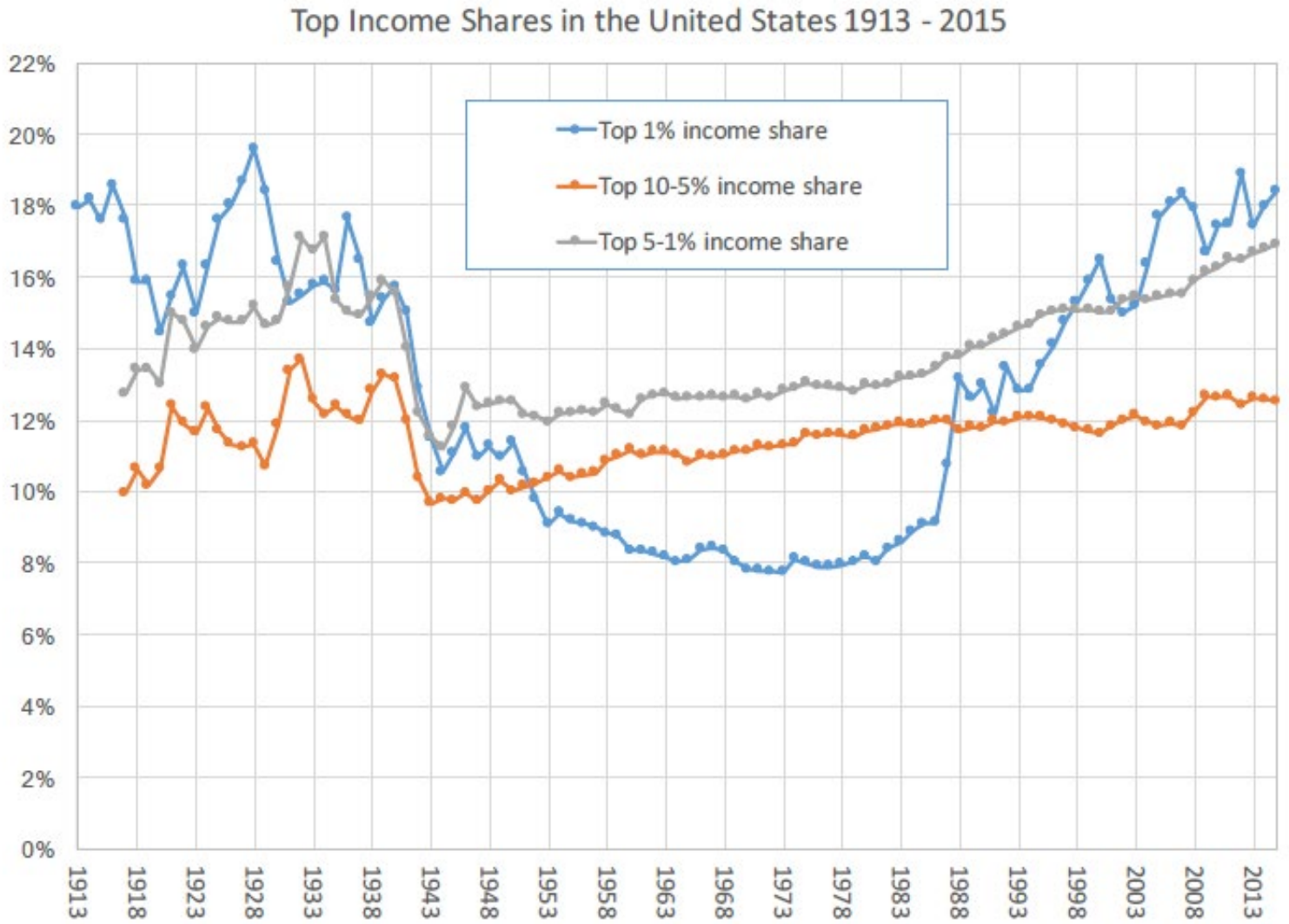


Note: CEO annual compensation is computed using the "options realized" compensation series, which includes salary, bonus, restricted stock grants, options exercised, and long-term incentive payouts for CEOs at the top 350 U.S. firms ranked by sales.

Source: Authors' analysis of data from Compustat's ExecuComp database and Federal Reserve Economic Data (FRED) from the Federal Reserve Bank of St. Louis.

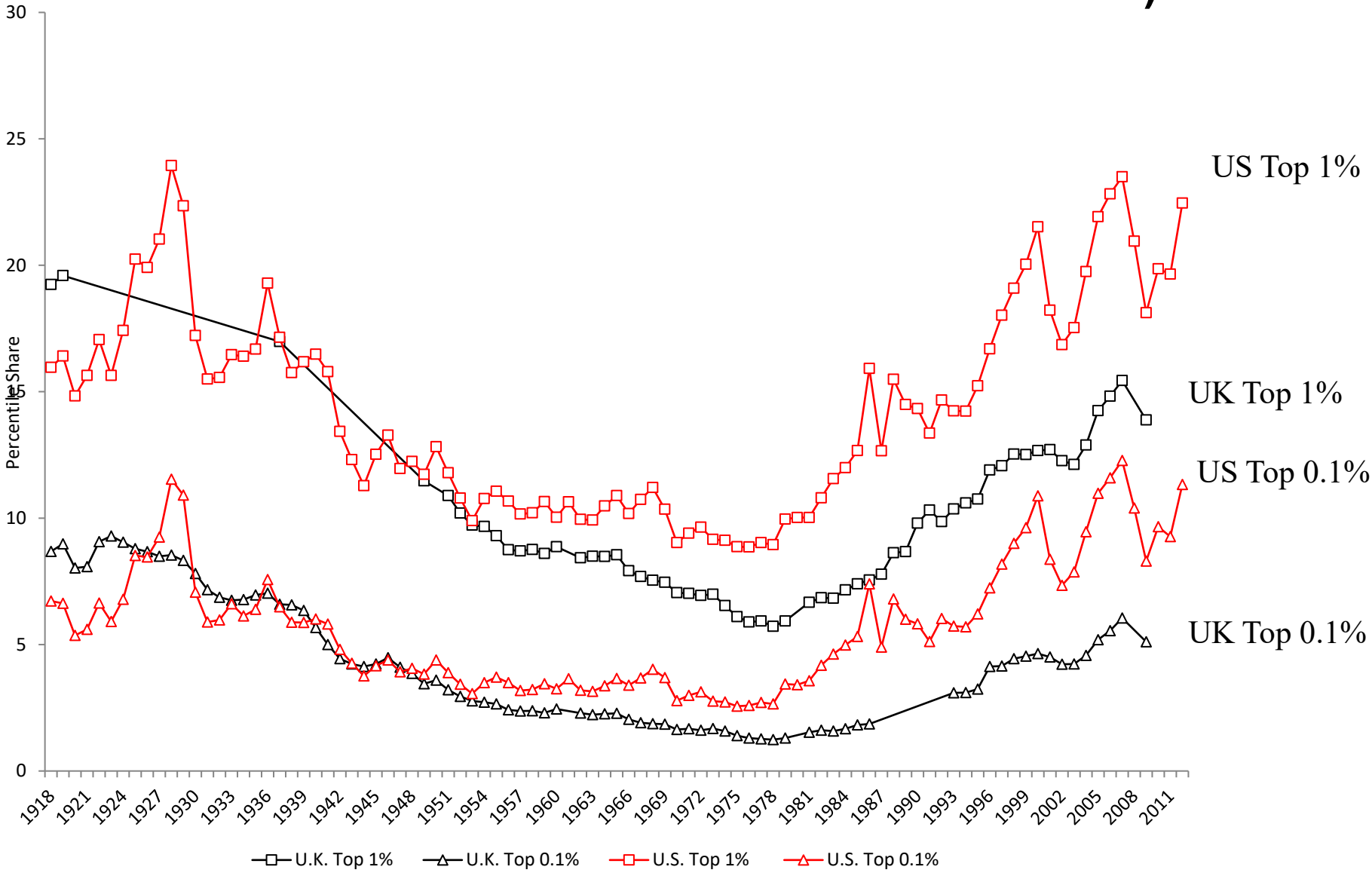
Economic Policy Institute

Concentration of U.S. Incomes has Risen Dramatically Since the Late 1970s



Alvaredo, Atkinson, Piketty, Saez, and Zucman 2016

INCOME SHARES AT THE VERY TOP IN US & UK (CEO INCOME GROWTH LIKE OTHER TOP EARNERS)



Source: Atkinson, Piketty & Saez; High Income Database

CONCLUSIONS FROM BELL & VAN REENEN (2016)

- CEO pay-performance link asymmetric: stronger on upside than downside & this more pronounced when corporate gov poor (II low and/or IVIS index)
- “Pay for luck” (industry shocks) remains strong & has not been much weakened by sector LTIPs
  - CEOs get themselves more generous incentive pay awards when existing LTIPs fail