Eclipse of Rent-Sharing:
The Effects of Managers' Business Education on Wages and the Labor Share in the US and Denmark

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Motivation

- A key fact of organizational economics: huge and persistent productivity differences across firms in the same sector and seemingly similar characteristics — e.g., Walmart vs. Kmart.
- For example, within the same four-digit industry in the US, there is an approximately twofold gap between the TFP level of the top 90th and the bottom 10th percentile plants (e.g., Syverson, 2004). The difference is much larger within developing countries (e.g., Hsieh and Klenow, 2009).
- **Hypothesis**: a major component of this is "organizational", related to what managers do (Cyert and March, 1963; Gibbons and Henderson, 2013).
- Indeed, significant differences in manager characteristics and procedures that managers implement in the production process (e.g., Bertrand and Schoar, 2003; Bloom and Van Reenen, 2007; Bloom, Sadun and Van Reenen, 2012).
- So what do managers do?

Ideas, Vision and Ideology of Managers

- The organizational economics literature cares about managers, because they are **powerful actors**:
    - Away from fully competitive markets and perfect control by shareholders/boards, managers have discretion, so their creativity, choices and procedural practices could matter for productivity.
- But by the same token, powerful actors can have other important effects on organizations and outcomes.
- Their ideas, "vision" and "ideology" could also matter for *who benefits from higher profits, how high wages are, and how well workers are treated*.
    - For example, in the first half of the 20th century, ideas of "welfare capitalism" were popular among managers, and remain so among some of them in the 1950s and 60s. Arguably replaced by "shareholder values" and focus on stock market performance in later decades.
- This paper:
    - focus on one important aspect that shapes priorities, ideas and ideologies of managers — **business school education**.

Setting

- Major changes in the distribution of income in advanced economies. For example:
    - Labor share declined from 65% to 60% in the US and from around 69% to 65% in Denmark over the last two decades.
    - Median (real) wage growth decreased from 2% per year between the 1950s and 1970s to only 0.3% per year since 1980 in the US

- In this context, the focus has been on:
    - skill-biased technological change/automation;
    - trade;
    - market power and superstar firms;
    - erosion in the value of the minimum wage, the decline in unionization, the threat of offshoring, etc.

- What about "vision" and "values" of powerful players?

Business Education

- The share of managers with business education (e.g., MBAs) has increased among CEOs both in the US and Denmark.

Company	Current CEO	Degree	Start year
Amazon	Andy Jassy	MBA, HBS	2021
Google	Sundar Pichai	MBA, Wharton	2015
Microsoft	Satya Nadella	MBA, Chicago Booth	2014
Apple	Tim Cook	MBA, Duke Fuqua	2011
Walmart	Doug McMillon	MBA, U of Tulsa	2014
CVS	Karen Lynch	BA accounting, Boston College	2021
Exxon	Darren Woods	MBA, Northwestern Kellogg	2017
Lego	Niels Christiansen	MBA, INSEAD	2017
Maersk	Soren Skou	BA, Copenhagen Business School	2016

- The share of US public companies with business CEOs grew from 26% in 1980 to 43% in 2020

What Does Business Education Do?

- Management practices and values often originate and are imparted by business schools, including:
    - Emphasis on shareholder value maximization
    - Reengineering and creating lean corporations and cutting "unnecessary" costs
    - "The two institutions of management and business education have reciprocally defined the ultimate ends of the corporation" – Rakesh Khurana, *From Higher Aims to Hired Hands*

- Did these ideas popularized by business schools have a meaningful impact on wages and inequality?

- Are effects on wages as secondary one relative to their productivity implications?

- Viewed as a case study of powerful institutions propagating ideas with major effects on economic outcomes and distribution

Summary of Results

- Business education does not make managers more productive—business managers do not have significantly greater sales, employment, or investments.

- However, both in Denmark and the US, the appointment of a business manager is associated with a significant decline in average wages and the labor share and an increase in profits.
    - For example, in the US, a business manager reduces wages by 6% and the labor share by 5 percentage points five years after his or her accession.

- The results are largely accounted for by a decline in rent-sharing—exogenous positive shocks are shared with workers by non-business managers, but zero sharing by business managers.

- Exploiting within-high school-cohort role models in college major choice, we also show that these results are due to the values and approaches inculcated by business schools, not driven by selection.

Share of Business Managers in the US
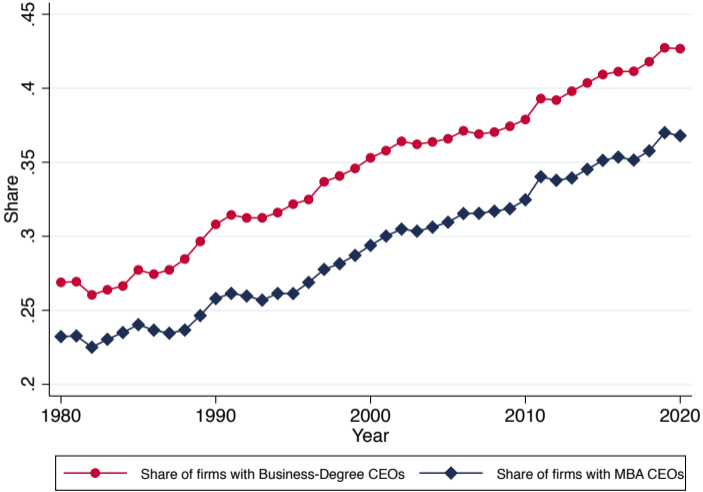
In Denmark, the share of business managers increased from 11% in 1995 to 19% in 2011

Empirical Strategy

- The key relationship we are interested in estimating is:

$$y_{it} = \gamma_t B_{it} + X_{it}'\beta_t + \lambda_i + \delta_t + \varepsilon_{it}$$

B_{it}: indicator variable for whether manager at firm i in year t has a business degree

λ_i: firm fixed effects

δ_t: year fixed effects

X_{it}: vector of covariates, including industry$\times$year fixed effects, state(region)$\times$year fixed effects, initial firm size quintile$\times$year fixed effects (and firm$\times$person fixed effects in worker-level regressions)

- Focus on event studies, corresponding to transitions from non-business managers to business managers
    - Use the "imputation" estimator from Borusyak, Jaravel, and Spiess (2021) to compute dynamic difference-in-differences models with staggered timing

Business Managers and Productivity: Event Study Estimates, US
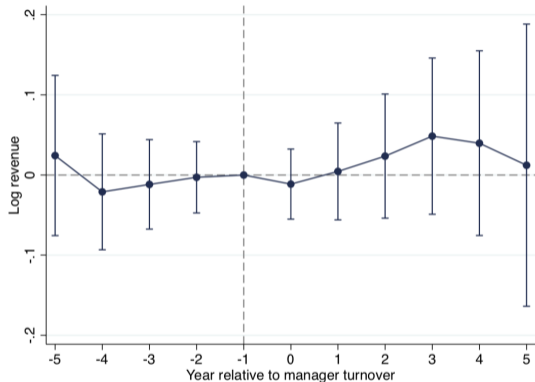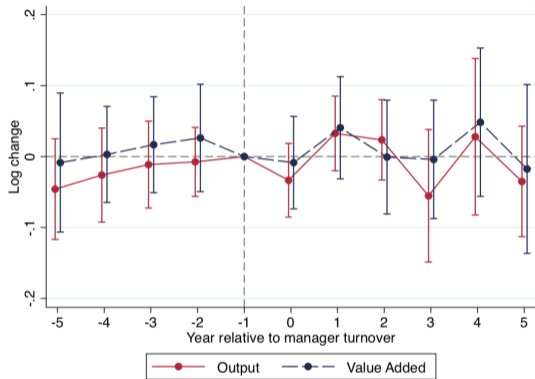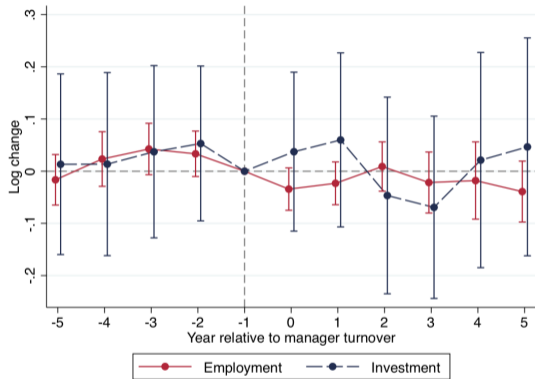

(c) Output
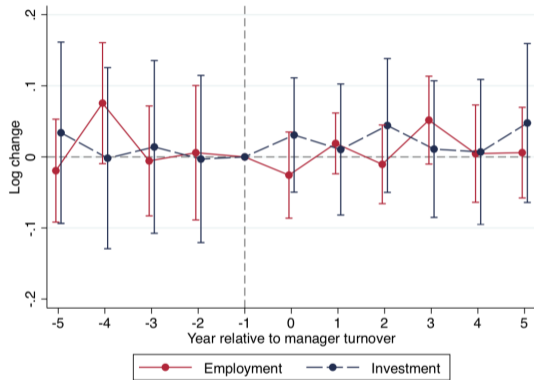
(d) Employment and Investment

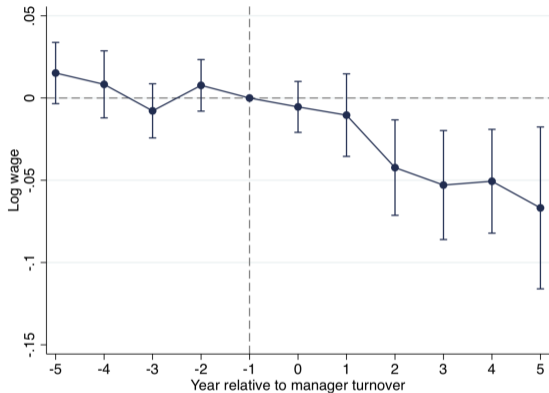# Business Managers and Productivity: Event Study Estimates, Denmark
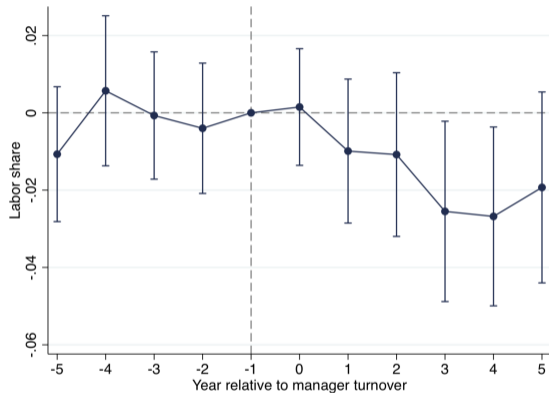

(c) Output and Value Added

(d) Employment and Investment

Business Managers and Wages/Labor Share: Event Study Estimates, US

(a) Wage

(b) Labor Share

Business Managers and Wages/Labor Share: Event Study Estimates, Denmark
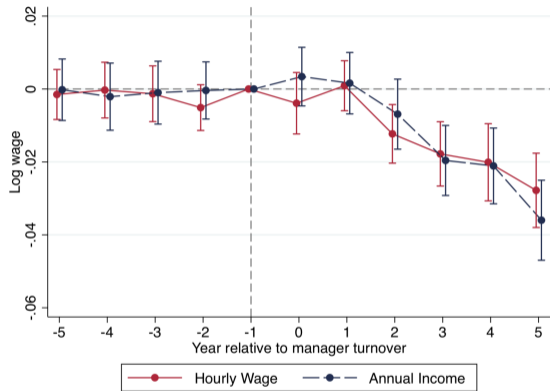
(a) Wage
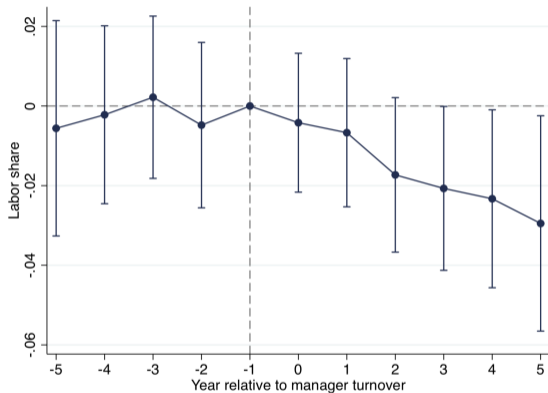
(b) Labor Share

Quantitative Magnitudes

- In the US, wages decrease by 6.7% and labor share decreases by 5 percentage points five years after the transition

- A 17% increase in share of business managers translates into a 1 percentage point decrease in labor share (of value added) and 0.3% lower wage growth per year

- This accounts for **20%** of the overall decline in labor share and **15%** of the decline in wage growth

Endogeneity Concerns

1. There may be other organizational, economic, or financial changes implemented at the same time as new business managers come in
   - Verify that there are no other major changes at the same time (some increase in leverage and robot purchase but magnitudes too small to explain wage changes) _{more}
   - Results are not driven by manager age and robust to excluding family CEOs, and no effect for transitions to non-business managers _{more}

2. Time-varying omitted factors correlated with both manager transitions and wages. In particular, perhaps business managers are brought in when the firm is in hardship and needs to cut wages.
   - Focus on sub-sample of manager retirements and deaths.
   - Show that no evidence of hard times before or after manager switches.
   - IV strategy exploiting the diffusion of business managers across similar firms

3. Selection of individuals into business major and business degrees
   - IV strategy using major choice of high school "role models"

Endogenous Manager Choice: Deaths and Retirements

- Manager choice concerns should be somewhat less pronounced when there is an exogenous exit of a manager.
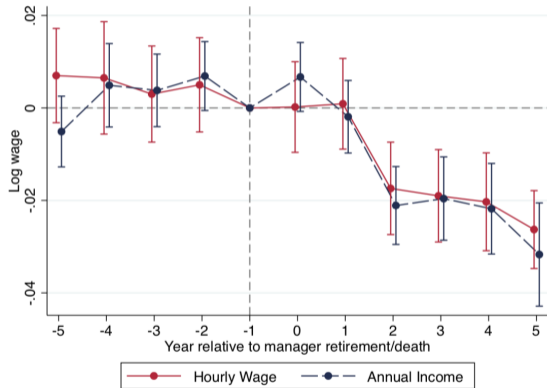
(a) Wage
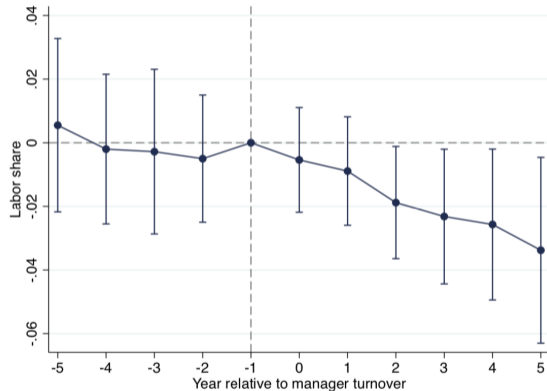
(b) Labor Share

Endogenous Manager Choice: No Signs of Hard Times

- Event study estimates show no declines in sales or profits or before or after switches.
- In fact, our results are largely driven by profitable/more concentrated industries.
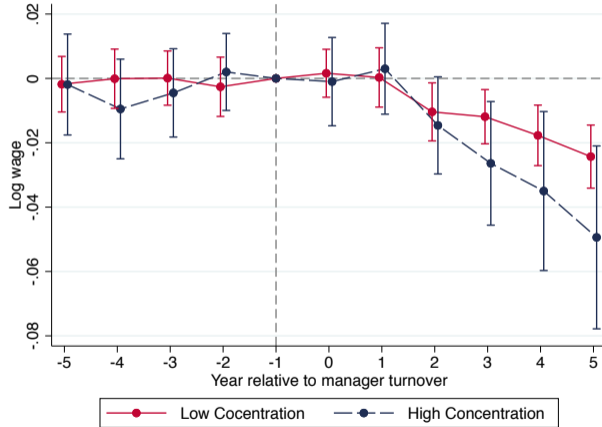
Endogenous Manager Choice: IV

- Hiring a manager with a business degree may become popular among certain types of firms at different times, similar to democratization waves in Acemoglu, Naidu, Restrepo, and Robinson (2019)

- Instrument the hiring of business manager using lagged business manager hiring of peer firms:

$$B_{it} = \sum_{k=1}^{3} \theta_k Z_{i,t-k} + X_{it}'\beta^F + \lambda_i^F + \delta_t^F + \epsilon_{it}$$

where $Z_{it} = \frac{1}{|I_i|} \sum_{j \in \{I_i : j \neq i, C_j = C_i, B_{jt_0} = 0\}} B_{jt}$ is the jackknifed average of business manager among firms in the same region$\times$industry$\times$size cell that did not have a business manager at the beginning of the sample   first stage

- Address firm-specific omitted variables correlated with business manager and wages: firms hire business managers because of a "fad" or learning from peers

IV Strategy: Diffusion of Business Managers

	Log Sales			Log Average Wage			Labor Share		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: US									
Business Major	-0.027	-0.051	-0.032	-0.094*	-0.075*	-0.105***	-0.035*	-0.023	-0.036**
	(0.052)	(0.046)	(0.043)	(0.055)	(0.044)	(0.041)	(0.019)	(0.015)	(0.016)
Panel B: Denmark									
Business Major	0.105	0.091	0.078	-0.048**	-0.038	-0.044*	-0.037	-0.046*	-0.052*
	(0.068)	(0.068)	(0.067)	(0.024)	(0.024)	(0.024)	(0.027)	(0.027)	(0.027)
Size-quintile-year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Number of lags as control	1	2	3	1	2	3	1	2	3
F statistic	32.6	44.8	41.9	32.6	44.8	41.9	32.6	44.8	41.9

Results are robust to controlling for:

- cell-specific trends

- lags of value added and wages of other firms in the same cell

Who Benefits?

- One clear group of beneficiaries of business managers are shareholders: ROA and stock market valuations go up (Greenwald, Lettau, and Ludvigson, 2019)
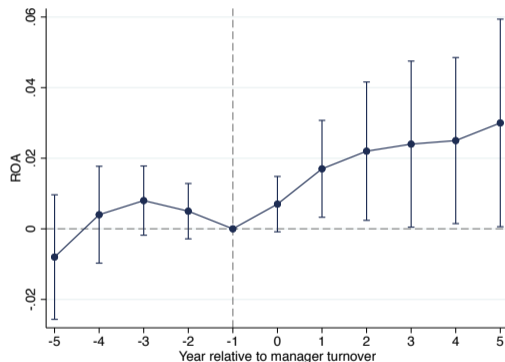
- Wage decline explains more than half of ROA ↑ in the US and all of ROA ↑ in Denmark
- Firms appointing business managers get abnormal returns of 4-7% in 3 years

Who Benefits?

- Firms accumulate more cash and pay more (via dividends and stock buybacks) to shareholders
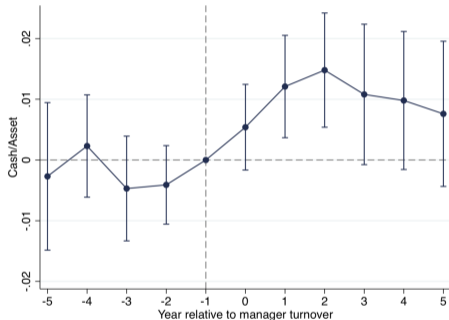
(a) Cash
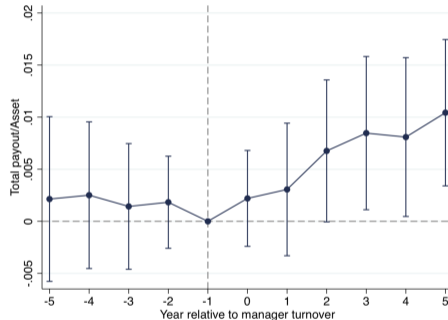
(b) Payout

- In Denmark, cash/assets go up by 0.5% and dividend/assets go up by 1.3% after 5 years

Who Benefits?

- Managers themselves also benefit by getting higher compensation

	Log Total Compensation of Managers			
	(1)	(2)	(3)	(4)
Business Major	0.164***	0.137***	0.065***	0.048***
	(0.012)	(0.012)	(0.010)	(0.013)
Year FE	Y	Y	Y	Y
Manager Characteristics	N	Y	Y	Y
Firm Characteristics	N	N	Y	Y
Firm FE	N	N	N	Y
Obs	37,873	36,495	36,049	35,971

Rent-Sharing: Alternative Strategy and Mechanisms

- Empirical strategy so far focusing on variation coming from changes in CEO.
- An alternative is to look at how different CEOs respond to similar shocks.
- This is informative both about the main finding reported so far and about the hypothesized mechanism
    - Effects of managers on rent-sharing.
    - Unwillingness of business managers to share rents, etc.
- Follow Hummels et al. (2014) to measure exogenous demand shocks coming from export markets
- Specifically, we use differences in exporting destination by six-digit product for each firm and exploit the fact that the demand for exports from Danish firms is changing differentially across these destination-products
    - For example, a change in demand for a product in Germany will disproportionately impact Danish firms exporting that product to the German market, and we proxy for the demand using overall German imports for that product (except from Denmark)

Business and Non-business Managers Grow Similarly After the Shocks

	Log Exports	Log Value Added	Log Employment	Log Value Added Per Worker	Log Profit Per Worker
	(1)	(2)	(3)	(4)	(5)
Export Shock*Non-Business Manager	**0.384***	**0.243***	**0.150***	**0.093***	**0.157***
	(0.084)	(0.065)	(0.030)	(0.031)	(0.086)
Export Shock*Business Manager	**0.424***	**0.265***	**0.179***	**0.086****	**0.171***
	(0.122)	(0.077)	(0.049)	(0.040)	(0.093)
Industry-year FE	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y

But Business Managers Do Not Share Rents After Positive Shocks

	Log Hourly Wage	Log Income	Labor Share	Log Hourly Wage	Log Income	Labor Share
	(1)	(2)	(3)	(4)	(5)	(6)
Export Shock*Non-Business Manager	0.017***	0.022***	-0.013	0.013***	0.015***	-0.001
	(0.003)	(0.004)	(0.009)	(0.003)	(0.004)	(0.008)
Export Shock*Business Manager	0.002	0.010	-0.027**	-0.003	-0.001	-0.018**
	(0.007)	(0.007)	(0.012)	(0.007)	(0.006)	(0.009)
Log Output				0.013***	0.013**	-0.163***
				(0.003)	(0.005)	(0.011)
Log Employment				0.014***	0.045***	0.164***
				(0.004)	(0.005)	(0.012)
Log Capital-labor Ratio				0.003**	0.000	-0.010**
				(0.001)	(0.001)	(0.004)
Share of High-skilled Workers				0.088***	0.076***	0.224**
				(0.020)	(0.025)	(0.056)

- For non-business managers, a 10% increase in profits (value added) per worker is associated with a 1.0% (1.9%) increase in hourly wages. The elasticity is in the ballpark of the estimates (0.05-0.2) in the literature (Jäger et al., 2020)
- For business managers, the rent-sharing elasticity is almost zero
- The difference is completely driven by positive shocks

Rent-Sharing

- Quantitatively, this difference in rent-sharing can explain most of the wage changes: diff in rent-sharing $\Rightarrow$ 2.3% lower wages and 2.5pp lower labor share in 5 years (compared to 3% lower wages and 3pp lower labor share in the baseline)

- Similar results when looking at rent-sharing elasticities around manager transitions, or instrumenting for business manager hiring, or using intermediate import shocks
  transition   IV

- Consistent with the rent-sharing mechanism, we find larger effects in industries with higher concentration

Selection vs. Effects of Business Education

- We attempt to distinguish selection vs. effects of business degrees by instrumenting for major choice

- College major choice is heavily influenced by peers and role models
  (e.g., Arcidiacono and Nicholson, 2005; Poldin, Valeeva and Yudkevich, 2015)

- We instrument for business major using major choice of high school "role models" (students in previous cohort of the same high school & in the same GPA quartile):

$$BM_i = \beta BM_{s_i, c_i-1, q_i}^{Peer} + \alpha_{s_i c_i} + \omega_{q_i} + \epsilon_i$$

  This allows us to flexibly control for cohort×school FE and GPA quartile FE, and exploit only within-cohort, within-high school and within-GPA quartile variation

- Placebo tests using students in different GPA quartiles or cohorts a few years ahead

IV Estimates of Business Degree on Firm Outcomes

	Becoming a manager	Residual log annual wage	Residual log hourly wage	Residual labor share
	(1)	(2)	(3)	(4)
Business degree	**0.087****	**-0.039****	**-0.045****	**-0.028***
	(0.043)	(0.017)	(0.022)	(0.015)
School-cohort FE	Y	Y	Y	Y
GPA Quartile FE	Y	Y	Y	Y
F statistic	141.3	12.4	12.4	12.4
Obs	505,971	13,076	13,076	9,191

placebos

Summary and Preliminary Conclusions

- We document that managers with business education reduce wages and the labor share because they do not share rents with their workers following positive shocks.

- Changes in priorities, values, and beliefs of powerful actors could have major implications.

- The effects of business schools on managers can be viewed as a case study in this context.

- Our results suggest that this could be a potent channel impacting wages, labor share, and inequality.

Implications for Future Research

- Our results suggest that ideas popularized by business schools like shareholder value maximization and creating lean corporations may account for some of these changes in priorities and values.

- If so, what managers do may go beyond just introducing different procedures and practices that influence the activity.
    - In fact, in our setting, productivity effects appeared trivial.
    - Distributional impacts may be much more major.
    - And in this case, "manager ideology" may become even more important.

- But many questions remain:
    - What is it exactly that business schools do? Specific course content? Networks? Ongoing work based on digitizing the corpus of business school curricula.
    - Are business schools the tip of the iceberg? General diffusion of shareholder values and virtues of leanness; management consulting; "market fundamentalism".
    - What is the role of broader institutions, such as media, intellectuals, political parties, labor organization, and civil society?

Appendix

Event Study from Non-Business Manager to Non-Business Manager
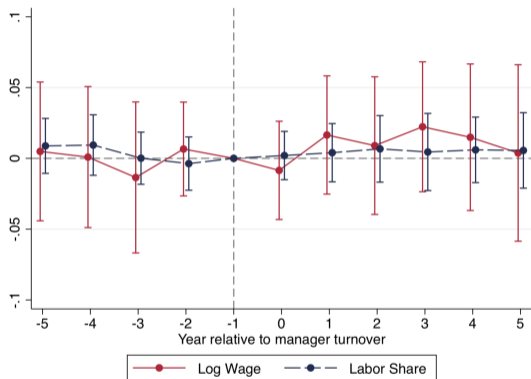
(a) Non-business to non-business, US   (b) Non-business to non-business, Denmark
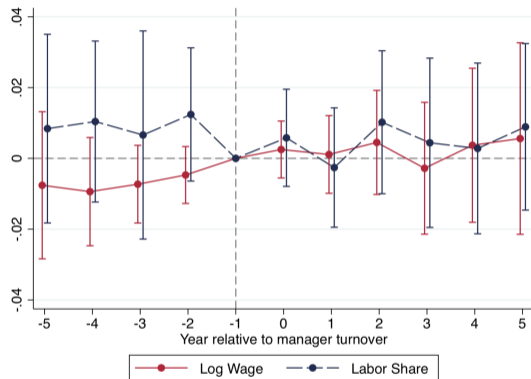
Event Study from Less Educated Manager to More Educated Manager
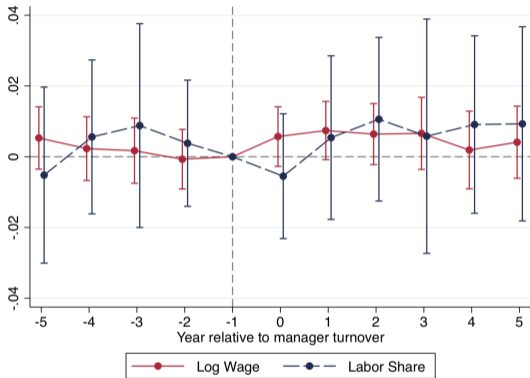
(c) Non-college to college, Denmark
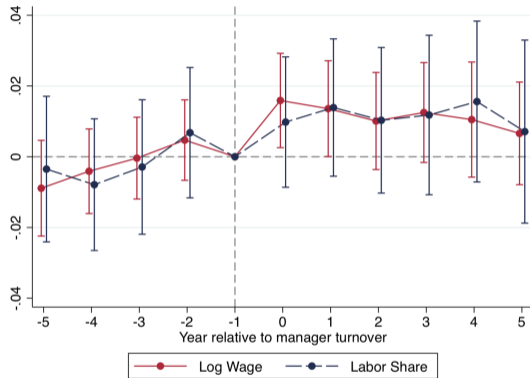
(d) Non-master to master, Denmark

Confounding Factors

- The only notable differences between business and non-business managers concern leverage and robot purchases

- These changes take place after the manager changes, and thus we interpret them to be not confounding factors, but potential outcomes of the new business manager's overall strategy

- In addition, the changes are not large enough to account for the (relative) decline in wages and the labor share
    - Using estimates from Acemoglu, Lelarge and Restrepo (2020) and Humlum (2019), the increase in robot purchases can account for at most 4% of our labor share results and at most 5% of our wage results
    - Using estimates from Michaels, Beau Page, and Whited (2019), the increase in leverage can account for at most 6% of the wage decline back

First Stage of Diffusion IV

back
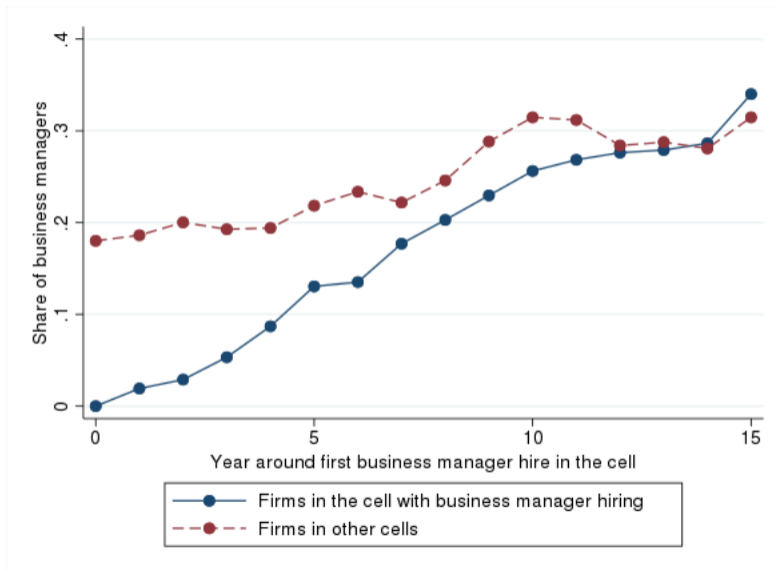
First Stage of Diffusion IV

	Business Manager							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Peer Firm Business Manager t-1	0.160***	0.083	0.158***	0.081	0.164***	0.066	0.149***	0.053
	(0.039)	(0.059)	(0.039)	(0.059)	(0.047)	(0.065)	(0.047)	(0.065)
Peer Firm Business Manager t-2		0.270***		0.274***		0.285***		0.291***
		(0.058)		(0.058)		(0.065)		(0.065)
Peer Firm Business Manager t-3		0.242***		0.239***		0.411***		0.394***
		(0.052)		(0.052)		(0.059)		(0.059)
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Size quintile-year FE			Y	Y	Y	Y	Y	Y
Industry*year FE					Y	Y	Y	Y
Lagged revenue and wages							Y	Y
F statistic	16.7	30.2	16.2	29.8	12.3	43.6	9.9	41.9

Compensation of Business Managers in Denmark

	Log Wage of Managers			
	(1)	(2)	(3)	(4)
Business Major	0.451***	0.142***	0.105***	0.084***
	(0.005)	(0.005)	(0.004)	(0.005)
Year FE	Y	Y	Y	Y
Manager Characteristics	N	Y	Y	Y
Firm Characteristics	N	N	Y	Y
Firm FE	N	N	N	Y
Obs	280,389	280,012	280,012	267,850

Response to Export Shocks Before and After Manager Transitions

	Value Added per Worker		Log Hourly Wage		Log Income		Labor Share	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export Shock*Pre	0.084**	0.074**	0.031***	0.017***	0.030***	0.021***	0.006	-0.013*
	(0.042)	(0.033)	(0.007)	(0.003)	(0.009)	(0.006)	(0.009)	(0.007)
Export Shock*Post	0.103**	0.082**	0.012	0.002	0.013	-0.012	-0.021**	-0.028***
	(0.044)	(0.039)	(0.008)	(0.008)	(0.009)	(0.010)	(0.011)	(0.010)
Industry-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Worker-firm FE			Y	Y	Y	Y		
Obs	1,582	6,296	544,119	1,303,209	544,117	1,303,050	1,402	5,504

back

IV Estimates of Wage Response to Export Shocks

	Log Hourly Wage		Log Income		Labor Share	
	(1)	(2)	(3)	(4)	(5)	(6)
Export Shock*(1-Predicted Business Manager)	0.019***	0.013***	0.021***	0.017***	-0.002	-0.002
	(0.002)	(0.001)	(0.004)	(0.003)	(0.012)	(0.010)
Export Shock*Predicted Business Manager	0.001	-0.006*	0.000	-0.001	-0.028**	-0.019*
	(0.004)	(0.003)	(0.007)	(0.004)	(0.013)	(0.011)
Log Output		-0.004		0.011**		-0.174***
		(0.003)		(0.005)		(0.016)
Log Employment		0.092***		0.099***		0.172***
		(0.006)		(0.010)		(0.017)
Log Capital-labor Ratio		0.002***		-0.006***		-0.011**
		(0.001)		(0.001)		(0.005)
Share of High-skilled Workers		0.395***		0.277***		0.322***
		(0.033)		(0.058)		(0.075)
Industry-year FE	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Worker-firm FE	Y	Y	Y	Y		
Obs	737,000	737,000	737,000	737,000	2,917	2,917

Placebo 1: Students in Same High School and Different GPA Quartile

	Business degree		Becoming a manager	Residual log annual wage	Residual log hourly wage	Residual labor share
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Business Majors in Same High School and Different GPA Quartiles	0.010	-0.052	-0.010	0.006	0.032	0.010
	(0.012)	(0.108)	(0.006)	(0.039)	(0.044)	(0.044)
School FE	Y	Y	Y	Y	Y	Y
Cohort FE	Y	Y	Y	Y	Y	Y
GPA Quartile FE	Y	Y	Y	Y	Y	Y
Obs	505,963	13,076	505,963	13,076	13,076	9,191

Placebo 2: Students in Different High School and Same GPA Quartile

	Business degree		Becoming a manager	Residual log annual wage	Residual log hourly wage	Residual labor share
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Business Majors in Same GPA Quartile and Different High Schools	0.046 (0.036)	0.042 (0.332)	0.027 (0.019)	-0.029 (0.121)	-0.055 (0.136)	0.011 (0.137)
School FE	Y	Y	Y	Y	Y	Y
Cohort FE	Y	Y	Y	Y	Y	Y
GPA Quartile FE	Y	Y	Y	Y	Y	Y
Obs	505,970	13,076 x	505,970	13,076	13,076	9,191

Placebo 3: Students in Same High School, GPA Quartile, But More Than Three Cohorts Ahead

	Business degree		Becoming a manager	Residual log annual wage	Residual log hourly wage	Residual labor share
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Business Majors in Same High School, GPA Quartile, and Three Cohorts Ahead	0.018**	0.051	0.007	0.005	-0.014	0.019
	(0.008)	(0.059)	(0.005)	(0.021)	(0.024)	(0.024)
School FE	Y	Y	Y	Y	Y	Y
Cohort FE	Y	Y	Y	Y	Y	Y
GPA Quartile FE	Y	Y	Y	Y	Y	Y
Obs	504,138	13,076	504,138	13,076	13,076	9,191