Employer Market Power in Silicon Valley

Matthew Gibson

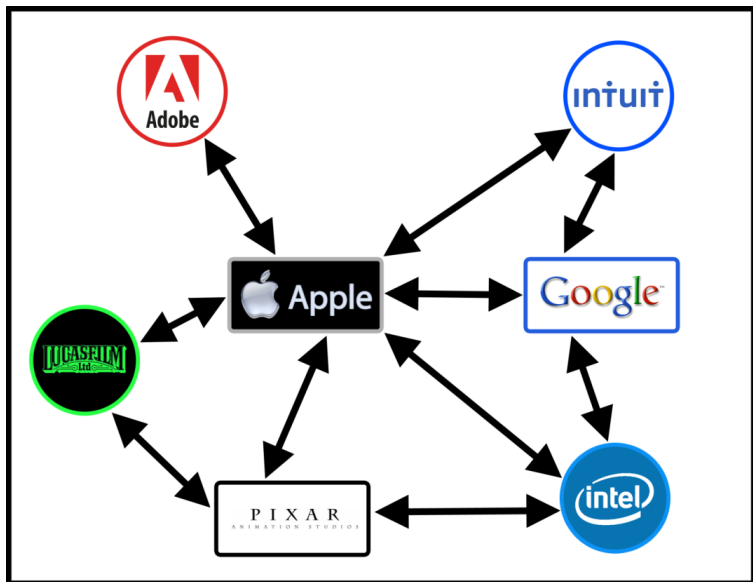### Williams College

Motivation

Share of Labour Compensation in GDP at Current National Prices for United States
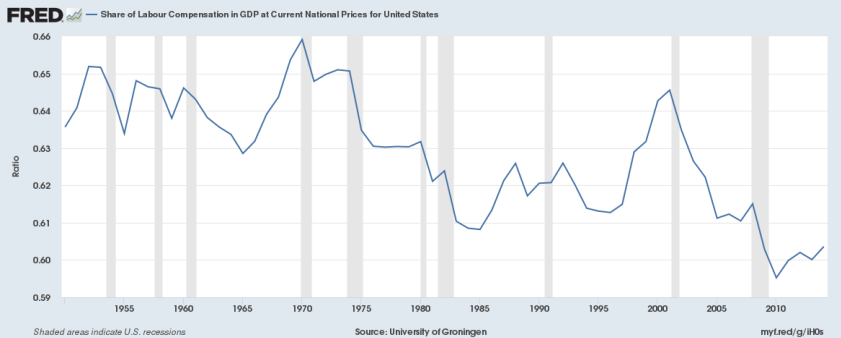
Question

- How does employer market power affect labor earnings?

Silicon Valley no-poach agreements

Silicon Valley no-poach agreements

I would be very pleased if your recruiting department would stop doing this.
> *–Steve Jobs (Apple) to Eric Schmidt (Google; 2005)*

Steve, . . . we investigated the recruiter's actions and she violated our policies. Apologies again on this. . . the sourcer who contacted this Apple employee should not have and will be terminated within the hour.
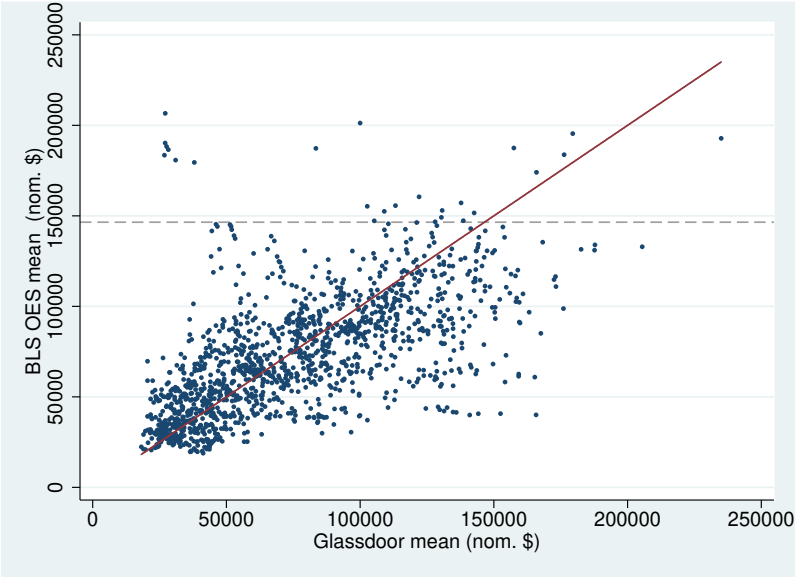> *–Schmidt reply to Jobs*

:)
> *–Jobs reply to Schmidt*

Data

- Salaries and occupations from Glassdoor
- Machine learning generates occupation groups
- Limit to regular, full-time workers ages 16-70, 2007-2017
- Industries:
  - Computer Hardware & Software
  - Internet
  - Motion Picture Production & Distribution

Glassdoor v. BLS OES

Empirical strategy: compensation

$$\ln\left(Salary_{egsjilt}\right) = \alpha_{eg} + \beta_{gt} + \gamma_l + \delta Num.Agreements_{et} + \varepsilon_{egsjilt}$$

Results: salary
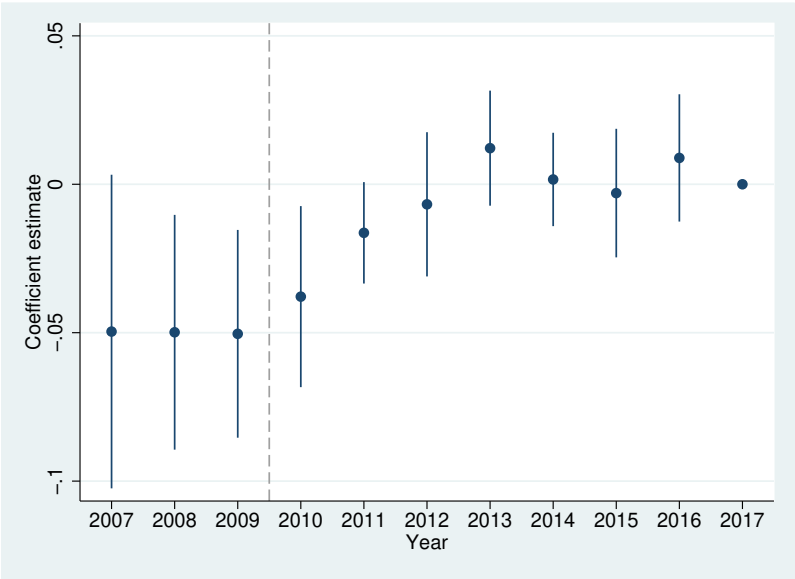
Results: salary

	ln(Salary)	ln(Salary)	ln(Salary)	ln(Salary)
Num. agreements	-0.0146*	-0.0190**	-0.0262***	-0.0398***
	(0.00790)	(0.00931)	(0.00861)	(0.00315)
General occupation FE	Yes	No	No	No
Specific occupation FE	No	Yes	No	No
Job title FE	No	No	Yes	Yes
User FE	No	No	No	Yes
Observations	198682	198682	198682	5091

Results: DDD

	ln(Salary)	ln(Salary)	ln(Salary)	ln(Salary)
Num. agreements	0.00675	0.00698	-0.00252	0.280**
	(0.00992)	(0.0119)	(0.00727)	(0.133)
Num. agreements*technical class	-0.0286***	-0.0343***	-0.0309***	-0.320**
	(0.0104)	(0.0109)	(0.00748)	(0.127)
General occupation FE	Yes	No	No	No
Specific occupation FE	No	Yes	No	No
Job title FE	No	No	Yes	Yes
User FE	No	No	No	Yes
Observations	198585	198585	198585	5058

Results: other compensation

	Cash bonus - LPM	ln(Cash bonus)	Cash bonus - PPML
Num. agreements	0.00614	-0.0579	0.0714
	(0.00921)	(0.0560)	(0.0842)
Observations	198682	71705	153835
	Stock bonus - LPM	ln(Stock bonus)	Stock bonus - PPML
Num. agreements	-0.0511***	-0.239***	-0.252***
	(0.00502)	(0.0266)	(0.0599)
Observations	198682	36927	102114
	Profit sharing - LPM	ln(Profit sharing)	Profit sharing - PPML
Num. agreements	0.00484	-0.135	0.118
	(0.00721)	(0.156)	(0.351)
Observations	198682	3906	53262

Empirical strategy: worker flows

$$\ln\left[\frac{pr_{eit}\left(C=c\right)}{pr_{eit}\left(C=1\right)}\right] = \alpha \, Treated_e + \beta \, Collusion_t + \delta \, Treated_e * Collusion_t + \nu_{eit}$$

Results: worker flows

pr(Stay)	0.0654	0.0759	0.0878	0.0624
	(0.0706)	(0.0671)	(0.0677)	(0.0650)
pr(Leave for treated employer)	-0.0613	-0.0603	-0.0633	-0.0635*
	(0.0408)	(0.0407)	(0.0408)	(0.0383)
pr(Leave for control employer)	-0.00409	-0.0156	-0.0245	0.00110
	(0.0714)	(0.0684)	(0.0689)	(0.0663)
Observations	14492	14492	14492	14492

Robustness: no switchers

	ln(Salary)	ln(Salary)	ln(Salary)	ln(Salary)
Num. agreements	-0.0132*	-0.0175*	-0.0257***	-0.0735***
	(0.00751)	(0.00926)	(0.00880)	(0.00188)
General occupation FE	Yes	No	No	No
Specific occupation FE	No	Yes	No	No
Job title FE	No	No	Yes	Yes
User FE	No	No	No	Yes
Observations	196245	196245	196245	3961

Robustness: give-to-get

	ln(Salary)	ln(Salary)	ln(Salary)
Num. agreements	-0.0878	-0.103	-0.0479
	(0.0585)	(0.0702)	(0.0508)
General occupation FE	Yes	No	No
Specific occupation FE	No	Yes	No
Job title FE	No	No	Yes
Observations	27427	27427	27427

Damages estimate

- Plaintiffs' expert report: 109,048 class members, \$52bn in affected earnings
- Avg. marginal effect: $2 * -.026 = -.052$ percent
- Earnings w/o agreements: $\frac{\$52\,bn}{1-.052} = \$54.85\,bn$
- Employee losses: $\$2.85\,bn$

Further analysis

- Silicon Valley job reviews
- Chains abandoning non-competes, esp. fast food

Conclusion

- No-poach agreements substantially reduce labor income
- Descriptive evidence shows broad scope for exercise of market power
- Lends weight to calls for increased scrutiny of employer market power
  - Mergers
  - Arbitration
  - Non-compete clauses

Thank you

- Questions & comments welcome: mg17@williams.edu

Theory: worker problem

$$u_i(s) = \begin{cases} w_i & \text{if stay} \\ v_j - \sigma_{ij}s & \text{if leave for } j \\ v_k - \sigma_{ik}s & \text{if leave for } k \end{cases}$$
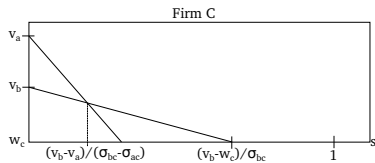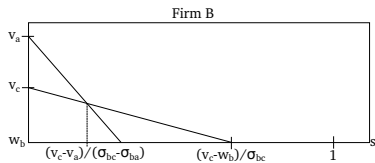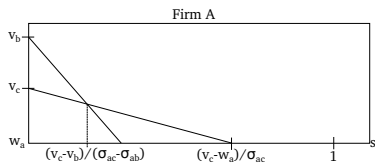
Theory: firm problem

$$\max_{w_i, v_i} p_i \left[n\phi l_{ii} + n\phi' \left(l_{ji} + l_{ki} \right) \right] - \left[n w_i l_{ii} + n v_i \left(l_{ji} + l_{ki} \right) \right]$$
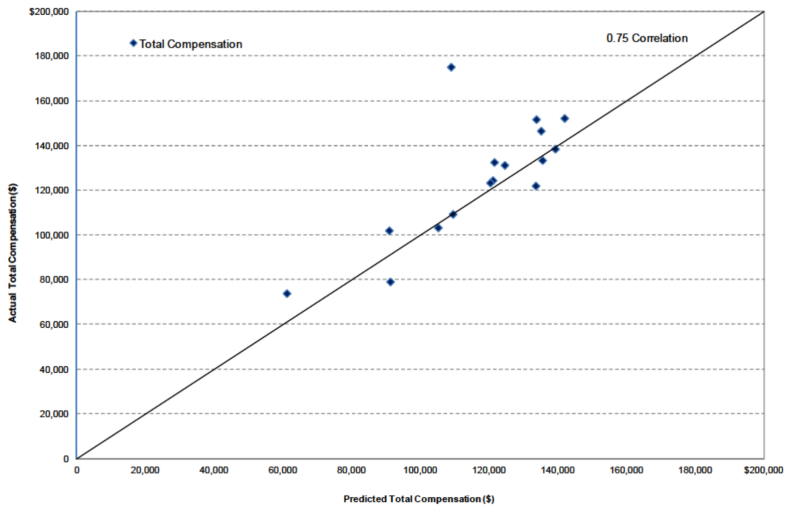
$$\left(p_i \phi - w_i \right) \frac{\partial l_{ii}}{\partial w_i} - l_{ii} = 0$$

$$\left(p_i \phi' - v_i \right) \left(\frac{\partial l_{ji}}{\partial v_i} + \frac{\partial l_{ki}}{\partial v_i} \right) - \left(l_{ji} + l_{ki} \right) = 0$$

Theory: equilibrium

Sample selection

Source: Expert Report of Edward Leamer, Ph.D. (2012)

Descriptive statistics

	mean	sd	min	max
Base pay	85,542	41,505	12,870	863,106
Cash bonus	19,982	269,308	0	32,167,392
Stock bonus	16,053	336,700	0	41,817,608
Profit sharing	52,119	23,771,252	0	1.10e+10
Female	0.27	0.44	0	1
Age	33.1	8.5	16	70
High school	0.05	0.22	0	1
Some college	0.02	0.13	0	1
College	0.62	0.49	0	1
Graduate degree	0.31	0.46	0	1

Occupation examples

General occupation	Specific occupation	Job title
software engineer	software engineer	software engineer
branch manager	manager	senior software engineer
engineer	software development engineer	account executive
account executive	account executive	account manager
product manager	program manager	project manager

Results: HR interaction

	ln(Salary)	ln(Salary)	ln(Salary)
Num. agreements	-0.0150*	-0.0192**	-0.0264***
	(0.00781)	(0.00933)	(0.00866)
HR=1*Num. agreements	0.0561***	0.0393*	0.0378**
	(0.0151)	(0.0211)	(0.0173)
General occupation FE	Yes	No	No
Specific occupation FE	No	Yes	No
Job title FE	No	No	Yes
Observations	198682	198682	198682

Results: salary, by report date
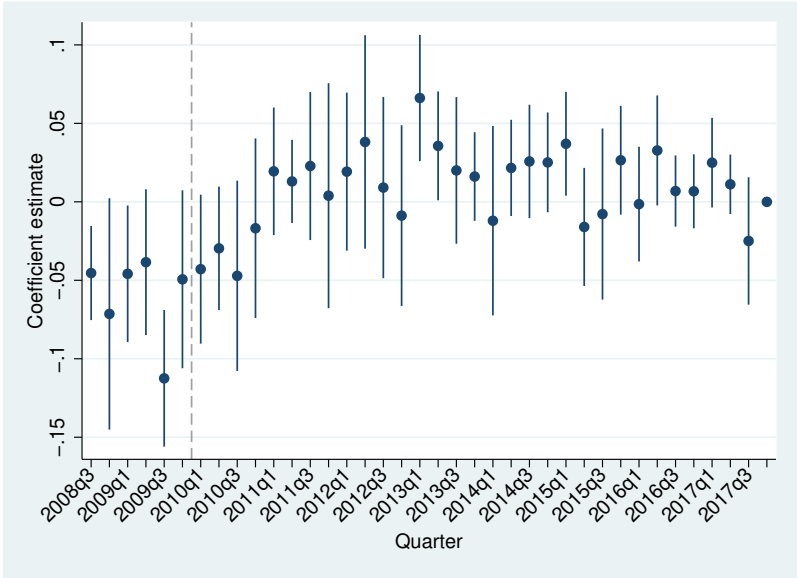
Results: salary, user FE sample

	ln(Salary)	ln(Salary)	ln(Salary)	ln(Salary)
Num. agreements	-0.0453	-0.0493	-0.0461***	-0.0398***
	(.)	(.)	(0.00568)	(0.00315)
General occ. controls	Yes	No	No	No
Specific occ. controls	No	Yes	No	No
Job title controls	No	No	Yes	Yes
User FE	No	No	No	Yes
Observations	5091	5091	5091	5091

Robustness: alt. treatment

	ln(Salary)	ln(Salary)	ln(Salary)	ln(Salary)
Agreement in force	-0.0158	-0.0244	-0.0464**	-0.0754***
	(0.0160)	(0.0208)	(0.0206)	(0.0208)
General occupation FE	Yes	No	No	No
Specific occupation FE	No	Yes	No	No
Job title FE	No	No	Yes	Yes
User FE	No	No	No	Yes
Observations	198682	198682	198682	5091

Robustness: demographics

	ln(Salary)	ln(Salary)	ln(Salary)	ln(Salary)
Num. agreements	-0.0125	-0.0185	-0.0274***	-0.0231***
	(0.0101)	(0.0122)	(0.00759)	(0.00641)
General occupation FE	Yes	No	No	No
Specific occupation FE	No	Yes	No	No
Job title FE	No	No	Yes	Yes
User FE	No	No	No	Yes
Observations	57766	57766	57766	1335

Robustness: salary in levels

	Annual salary	Annual salary	Annual salary	Annual salary
Num. agreements	-1540.4*	-2008.0*	-2759.8***	-4413.4
	(906.6)	(1123.8)	(999.2)	(.)
General occupation FE	Yes	No	No	No
Specific occupation FE	No	Yes	No	No
Job title FE	No	No	Yes	Yes
User FE	No	No	No	Yes
Observations	198682	198682	198682	5091