

COMPETITION & MONOPSONY IN LABOR MARKETS

THEORY, EVIDENCE, & ANTITRUST IMPLICATIONS

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Economists Incorporated
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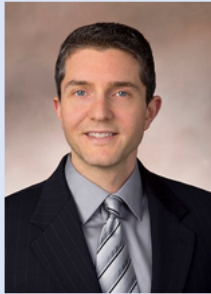
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Dr. Caves' economic consulting experience includes work in litigation and regulatory contexts, including modeling and estimation of damages, antitrust analysis, and public policy analysis. His work has been cited and appeared in various popular and academic outlets, including *Antitrust*, *The Atlantic*, *Communications & Strategies*, *The Economist*, *The Economists' Voice*, *Forbes*, *Information Economics & Policy*, *Journal of Competition Law & Economics*, *Labor Law Journal*, *Regulation*, *Research in Law & Economics*, *Review of Network Economics*, *Telecommunications Policy*, and *Wall Street Journal MarketWatch*. Topics covered by his published research include antitrust, telecommunications and network industry analysis, vertical integration, labor economics, applied econometrics, and class certification. He has also authored and co-authored various filings, white papers, and expert declarations in a variety of industries.

Dr. Caves received his doctorate from the University of California at Los Angeles in 2005, specializing in applied econometrics and industrial organization.

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OVERVIEW

- Part I: Economic Theory & Empirical Evidence
 - Necessary conditions for monopsony power to have anticompetitive effects
 - Empirical evidence: monopsony vs. competitive wage determination in labor markets
- Part II: Case Discussions
 - *Johnson v. Arizona Hospital & Healthcare Ass'n*
 - *In Re: High-Tech Employee Antitrust Litigation*

ECONOMIC THEORY

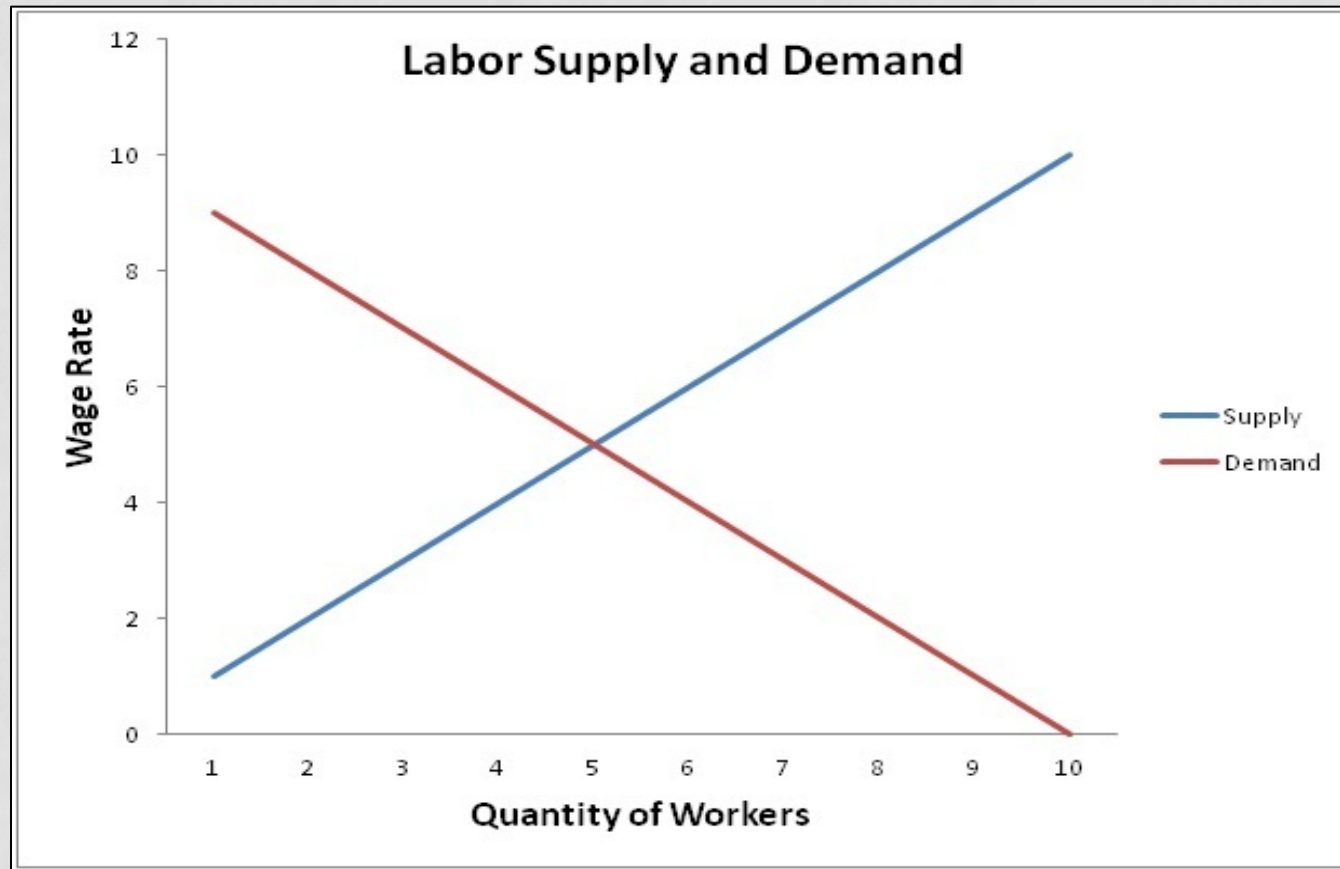
- Necessary Conditions for Anticompetitive Exercise of Buyer Power
 - Demand sufficiently concentrated for buyers to (collectively) exercise significant market power over sellers
 - Non-issue for retail markets (buyers take market price as given)
 - Supply sufficiently unconcentrated for sellers to be atomistic/uncoordinated
 - High concentration on both sides would imply “bilateral bargaining” situation
 - Economic pie divided based on bargaining skill; no clear anticompetitive effects

ECONOMIC THEORY

- Necessary Conditions (continued)
 - Supply curve must slope upward
 - Buyer faces tradeoff between
 - Buying more inputs to expand output; and
 - Paying higher price per unit of input
 - Cost minimization \leftrightarrow Profit maximization
- Typical focus: Buyers in input markets, particularly labor markets

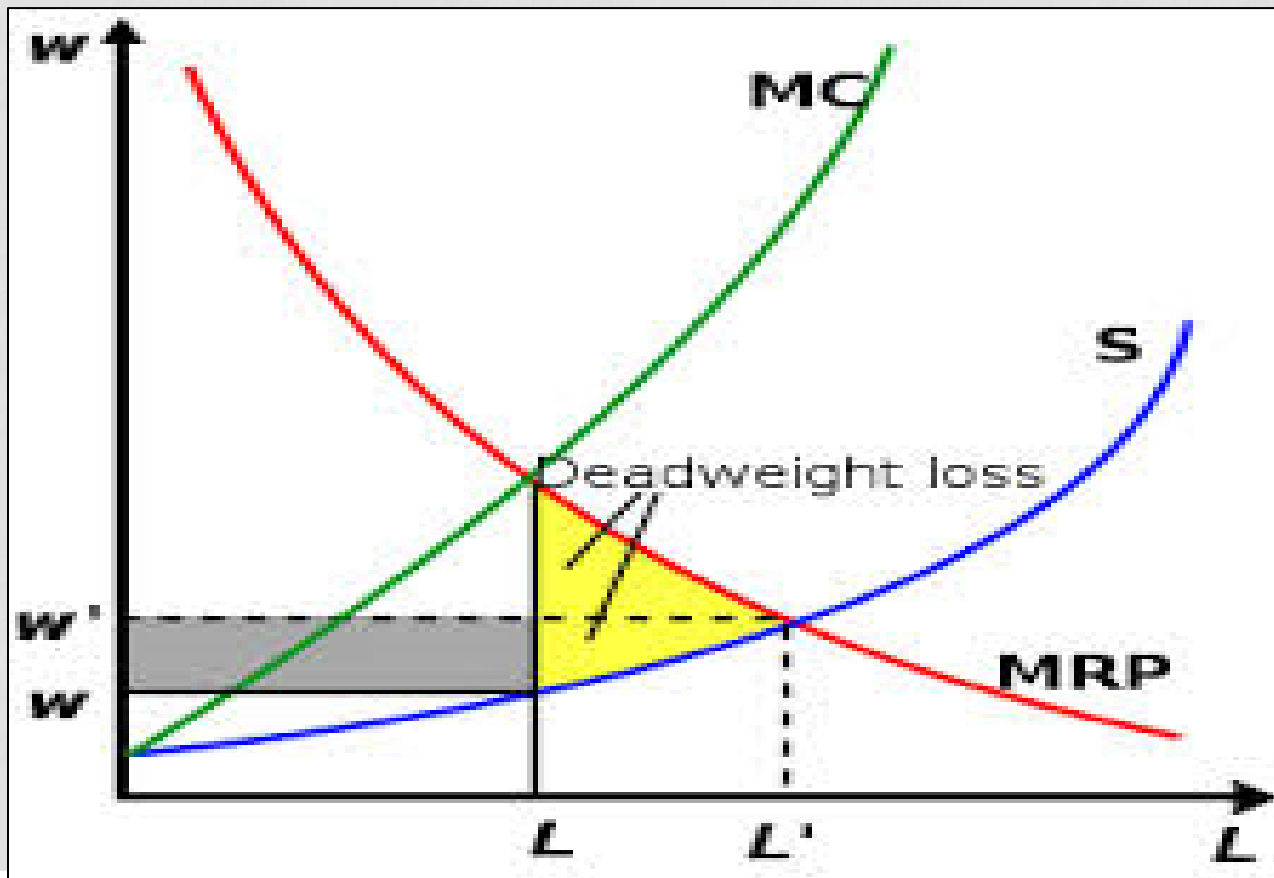
ECONOMIC THEORY

- Competition: Employers take market wage as given
→ $W = \text{Demand} = \text{MRP}_L$



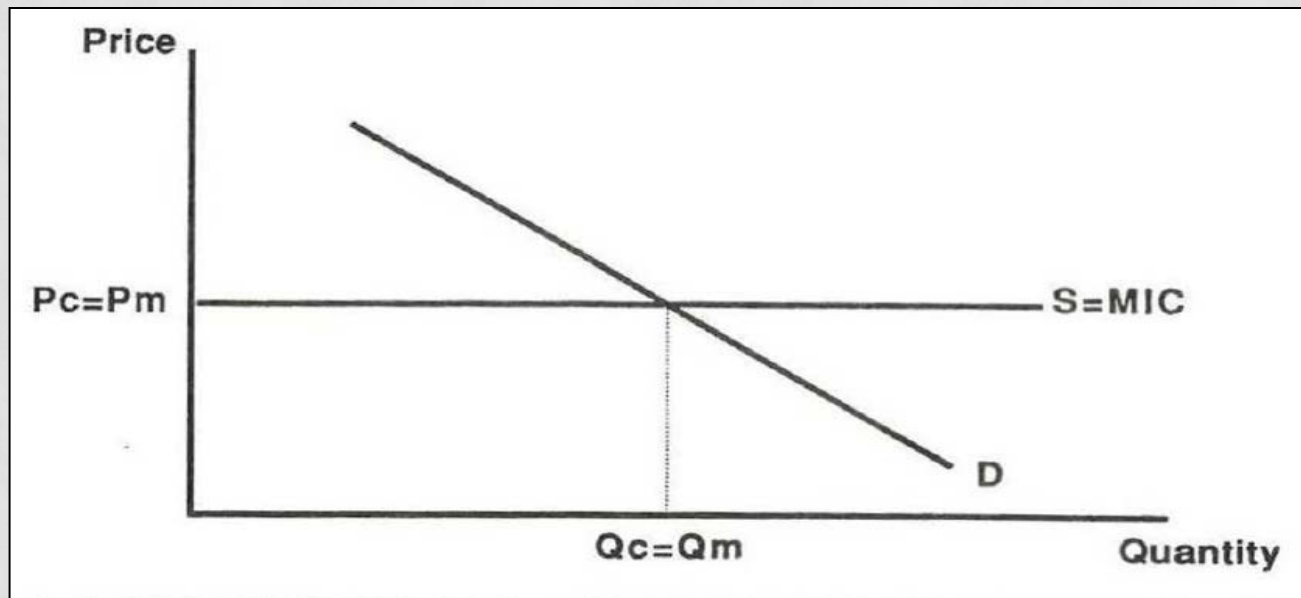
ECONOMIC THEORY

- Monopsony: Employer can raise (lower) wage by restricting (expanding) hiring $\rightarrow MRP_L = MC_L > W$



ECONOMIC THEORY

- Flat seller supply \rightarrow Monopsony power irrelevant



- Holds for input markets when suppliers have high FC, low MC
- Less likely to hold in labor markets

EMPIRICAL TESTS IN LABOR MARKETS

- Testing competing hypotheses: monopsony vs. competition
 - Card & Kreuger (AER, 1994)
 - April 1992: New Jersey minimum wage increased (\$4.25 to \$5.05); no change in minimum wage in neighboring PA
 - Compare change in employment (FTE) in NJ and PA, before vs. after minimum wage hike
 - FTE increased in NJ relative to PA; consistent with monopsony power in local labor market
 - Sparked long/controversial/ongoing literature of “difference-in-differences” approaches to tease out effects
 - Feldman & Scheffler (1982); Link & Russel (1981)
 - Under monopsony, higher employer concentration → Lower wages
 - Some evidence of lower RN wages when hospitals more concentrated

PART II: CASE DISCUSSIONS

1. *Johnson v. Arizona Hospital & Healthcare Ass'n*
2. *In Re: High-Tech Employee Antitrust Litigation*

JOHNSON V. AZHHA

- Plaintiffs alleged conspiracy among hospital members of Arizona Hospital & Healthcare Ass'n (AzHHA) to suppress bill rates for temporary nurses
- AzHHA maintained "registry" of nurse staffing agencies since late 1980s
 - Initial focus: Screening for quality/minimum standards
 - Late 1990s: To be listed on registry agencies must negotiate solely w/AzHHA
 - Agencies obliged to implement uniform bill rates across member hospitals for per diem & travel nurses
- Plaintiffs alleged AzHHA's uniform bill-rate schedule facilitated anticompetitive exercise of monopsony power & artificially depressed nurses' wages
 - (Disclosure: Singer and I worked for Plaintiffs)

JOHNSON V. AZHHA

- **Proof of Impact: Two-Pronged Approach**

1. Identify plausible economic theory—with corroborating evidence—connecting challenged conduct to anticompetitive effects
 - Assuming conduct occurred, does the economic literature point to price (or wage) effects that would be felt by Class members generally?
 - Can effects be shown in the instant case with common evidence?
2. Identify plausible mechanism—such as a rigid pricing structure—that would transmit these anticompetitive effects to a large share of the members of the proposed class
 - Is class sufficiently “cohesive” such that the challenged conduct would have been felt by all or nearly all putative class members?

JOHNSON V. AZHHA

- **Step 1:**
- Economic literature on exercise of monopsony power in nursing labor markets
 - Inverse relationship between hospital consolidation and nurse compensation; consistent with monopsony power
- Difference-differences benchmark: Empirical test for exercise of monopsony power by AzHHA
 - Compare change in compensation in Arizona nurses over time to changes for temporary nurses in neighboring states (where challenged conduct was absent)
 - Similar to Card & Krueger
 - Regression analysis can control for potentially confounding factors (e.g., demographics, state economic trends)

JOHNSON V. AZHHA

- **Step 2:**
- Pricing structure linking nurse compensation to fixed bill rate
 - AzHHA paid common hourly rate to staffing agencies, which passed through a percentage of that bill rate to class members
 - Plaintiffs' expert (Singer) showed bill rates positively correlated w/pay rates
 - Correlation analysis corroborated by documents & testimony
 - "In fact, Dr. Singer's data indicates that bill rates were positively correlated with pay rates for six types of temporary nursing staff, both per diem and traveling, at six AzHHA member agencies for all available years. Moreover, it stands to reason that, as the agencies have testified and is revealed by the financial records that have been produced through the course of discovery, **if bill rates were to rise, so would temporary nursing wages.**" - *Johnson*, 2009 WL 5031334 at *8

JOHNSON V. AZHHA

- **Outcome**
- District court certified class of per-diem nurses
 - Settlement reached for ~\$22.5M
- Court declined to certify travel nurse class
 - Travel nurses received ancillary benefits (housing, travel stipends)
 - “Offset” theory → Defendants may have altered another dimension of compensation, negating impact for at least some putative class members

JOHNSON V. AZHHA

- **Takeaway**
- Offsets and other complications in compensation structures prevented certification in several other cases, e.g., *Reed v. Advocate*:

“The *Reed* decision is consistent with a developing body of case law rejecting class certification with respect to allegations of a Section 1 wage conspiracy. Prior wage conspiracy cases...rejected class certification based largely on the great variety of employee characteristics that influence wages and variation in wages **and other compensation paid to employees**. This variation is a major obstacle to plaintiffs claiming they can prove impact on a class-wide basis with common proof...”

– Bloch & Perlman, *Antitrust*, Vol. 24, No. 3, Summer 2010 (emphasis added).

JOHNSON V. AZHHA

- **Takeaway**

- “Naked” wage fixing may be linked more easily to a benchmark than other conduct (agreements not to compete, information exchanges)
 - “Allegations of naked wage-setting pacts are perhaps the most analogous to the typical price-fixing cases in output markets. The empirical methodologies presented by plaintiffs in these cases, including the benchmark and regression approaches described above, are therefore more likely to support class certification than in other types of labor market cases. ”
--Johnson, David, & Torelli, *Antitrust*, Fall 2010
- Allegations involving a single entity may also be more amenable to common proof
 - “The certification of a class of per diem nurses in *Johnson* may be explained by the fact that a single trade association set uniform bill rates that its hospital members paid to agencies that employed the nurses, and there was evidence that these uniform bill rates correlated with compensation the nurses actually received.” – Bloch & Perlman, *Antitrust*, Summer 2010
- However, High-Tech Employee case provides important counter-example to this received wisdom

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- “If you hire a single one of these people, that means war.”
– Steve Jobs to Sergey Brin, February 2005



Steve Jobs in 2008. [Associated Press](#)

OVERVIEW: *IN RE HIGH-TECH*

- Background
 - Multiple alleged conspirators/agreements/time periods
 - Diverse array of class members/job categories
 - No explicit wage fixing
- Plaintiffs' proof of impact
 - Two pronged framework
 - Founded in theory; fact & data-intensive
- Defendants' critiques
 - Largely conceptual/methodological
 - Uniformly rejected

OVERVIEW: *IN RE HIGH-TECH*

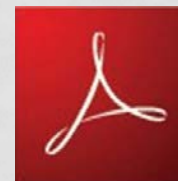
- **Takeaways - Preview**
- Even complex monopsony claims may be found amenable to common proof
 - Plaintiffs may exploit data-rich environment to show (1) overall effects; (2) pricing structure
- Heavy reliance on abstract critiques= risky defense strategy
 - Plaintiffs' data-driven approach calls for econometrically intensive response
- Explore alternative defense strategies

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Background**
- Alleged conspiracy among major Silicon Valley firms
 - “[I]nterconnected web of express bilateral agreements”
 - Aimed to “prevent a ‘bidding war’ for talent that would drive up wages...”
- Anti-solicitation (“No cold call”) agreements
 - Forbade unsolicited job offers to employees of competitors
- 2010 DOJ Case

Settlement

- Defendants agreed not to interfere with solicitation, cold calling, etc. for 5 years
- No admission of guilt
- No provisions for compensation; civil suit filed 2013



IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Background: Plaintiffs' Allegations**
 - Cold calling = key competitive tool
 - Particularly for high tech/high skill labor
 - Cold calling → Common increase in compensation & mobility
 - Benefits not limited to those receiving calls
 - Each bilateral agreement applied to all employees
 - Not limited by geography, job function, product, time period
 - Not related to specific business or collaboration
- Plaintiffs initially sought to certify All Employee Class
 - All salaried employees, 2005 – 2009
- Plaintiffs' backstop: Technical Class
 - Salaried technical, creative, and R&D employees

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Background: Court's Initial Findings**
- District Court initially unconvinced Plaintiffs could prove common impact
 - Court "expressed concern that Plaintiffs' examples—such as email exchanges between CEOs and discrete human resources documents from certain Defendants in particular years—might not be sufficient"
- Class cert denied on predominance grounds (with leave to amend)
 - Cited lack of methods/evidence "to show that Defendants maintained such rigid compensation structures that a suppression of wages to some employees would have affected all or nearly all Class members."

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Background: Latest Developments**
- Plaintiffs narrowed class to technical employees working for a firm participating in at least one anti-solicitation agreement
- Court certifies Technical Class (Oct 2013)
- Court denies motion to exclude testimony of Prof. Leamer, Plaintiffs' economist (April 2014)
 - Court's denial of *Daubert* motion delves into numerous technical/econometric issues

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Plaintiffs' Road Map To Proving Impact**
- Use economic theory, documents, & statistical analysis to show:
- (1) Evidence of general price effects;
 - Anti-solicitation agreements suppressed wages by preventing employees from discovering their full economic value to employers
- (2) Evidence of pricing structure
 - Mechanism through which wage suppression affects all or nearly all Class members
- Follows two-pronged approach developed by Singer in *Johnson* (cited in *Class Cert Order* at 53)

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Structure of Plaintiffs' Evidence**
- General Wage Effects
 - Economic theory: market price discovery/asymmetric information
 - Documents : "Impossible to keep secret..."
 - Statistical analysis:
 - Before/after regression
- Common Wage Structure
 - Economic theory: Long-term contracting; internal equity
 - Documents: "salary planning tools," "equity reports," managerial discretion (or lack thereof)
 - Statistical analysis:
 - Common factor regressions
 - Correlations: Job title comp with Tech Employee avg.
 - Regressions: Like correlations, but control for firm performance; local economic conditions; allow for lagged effect

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

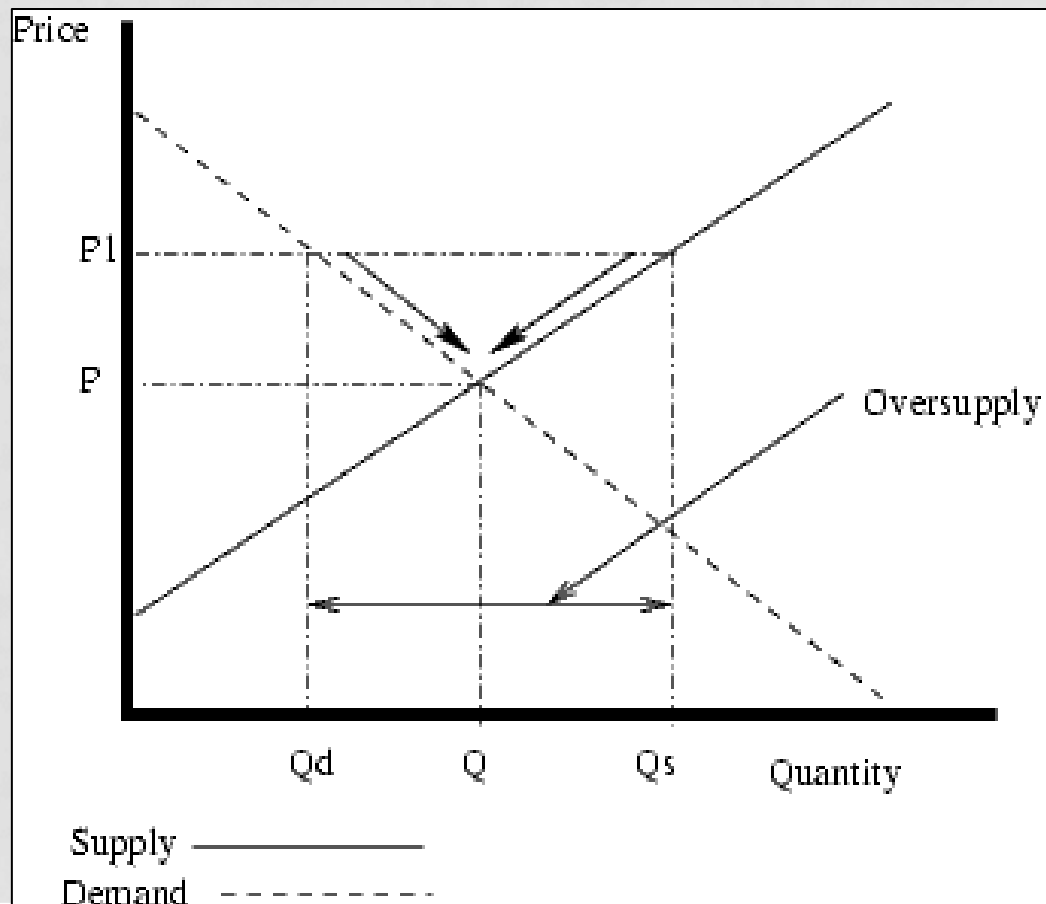
- **Economic Theory: Leamer Opinion**
- Cold calling transmits information on salaries & benefits across employees & firms
- Information may affect salaries across the labor market
- Leamer's hypothesis: Anti-solicitation agreements impaired *market price discovery* by limiting information available to employees

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Leamer Opinion: “Market Price Discovery”**
- Standard supply & demand model assumes employers & employees symmetrically informed about labor market conditions
- Market price discovery=process of establishing new competitive equilibrium
 - Increase in demand → employee shortage → higher wage
 - Assumes employees possess enough information to perceive that other employers would be willing to hire them for more than what they are currently earning

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- Equilibrium Adjustment Process



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- **Leamer Opinion: Information Economics**
- Leamer relies on theories of Akerlof, Stiglitz, Spence
 - 2001 Nobel laureates “for their analyses of markets with asymmetric information.”
 - Class cert decision cites Stiglitz’s Nobel lecture:
 - “even a small amount of information imperfection could have a profound effect on the nature of the equilibrium.”
 - “The fact that actions convey information leads people to alter their behavior, and changes how markets function. This is why information imperfections have such profound effects.”
- Interestingly, when studying the labor market, Stiglitz found information imperfections would increase the equilibrium wage (“efficiency wage theory”)

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- **Information Asymmetry - Sample Document**
- “[i]t’s impossible to keep something like this a secret. The people getting counter offers talk, not just to Googlers and ex-Googlers, but also to the competitors where they received their offers (in the hopes of improving them), and those competitors talk too, using it as a tool to recruit more Googlers...it feels like my loyalty is being punished.”
 - Google employee (*Class Cert Order* at 39)

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **General Wage Effects: Econometrics**
- Leamer's "Conduct Regression"
 - Dependent variable = real annual compensation
 - Conduct variable = "fraction of months in each year during which the employer was involved in one or more of the agreements."
 - Control variables: Age, sex, years at company, firm revenue, firm new hires, industry-wide effects
 - Yields estimate of average net under-compensation

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- **Common Wage Structure: Leamer Opinion**
- Labor markets differ from commodity markets
 - “If workers were commodities, every small change to external or internal conditions would lead to recontracting, separation, or termination. This would create enormous uncertainty and disruption and insecurity for employer and employee.” - Leamer Rep. ¶ 102.
 - Firms & employees seek to establish long-term relationships, in part by promoting a feeling of “fairness that can translate into a sharing of . . . [a firm’s] rewards with more equality than a market might otherwise produce.” *Id.* ¶ 104.

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- **Common Wage Structure: Leamer Opinion**

- “Dr. Leamer also noted that the documentary evidence showed that Defendants each employed company-wide compensation structures that included grades and titles, and that high-level management established ranges of salaries for grades and titles, which left little scope for individual variation.”

-Order Re: Motion to Exclude at 10

- Leamer: “a broad preemptive response [to the threat of cold calls] is completely analogous to salary increases that are tied to information provided by employment services regarding the compensation offered by the ‘market.’

-Suppl. Class Cert. Rep. ¶ 15

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- **Common Wage Structure- Documents**

- When Apple considers a new hire, “compar[ing] the candidate” to the existing employees on the team they would join “was the biggest determining factor on what salary we gave.”

-Former Apple Technical Recruiter & Staffing Manager

- LucasFilm made regular “[C]all-O[ut] [E]quity A]djustment[s]” — individual compensation increases for the explicit purpose of “align[ing] the employee more appropriately in their salary range . . . [and] based on how that employee aligns with their internal peer group based on the same set of criteria.”

- Former LucasFilm Operating Officer

- “[y]ou can’t afford to be a rich target for other companies..[the] long-term . . . right approach is not to deal with these situations as one-off’s but to have a *systematic approach* to compensation that makes it very difficult for anyone to get a better offer..”

- Google Senior VP

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- **Common Wage Structure - Econometrics**
- Leamer's "Common Factors" regression
 - Analyzed employee-specific compensation
 - 90% of variation in pay explained by common factors (age, title, months at company etc.)
 - "[t]he fact that nearly all variability in class member compensation at any point in time can be explained by common variables means there was a systematic structure to employee compensation at each of the Defendant firms." - *Class Cert. Opening Rep.* ¶130
 - Combined with stability of regression coefficients over time, suggests "compensation of class members tended to move together over time and in response to common factors." *Id.*

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- **Common Wage Structure - Econometrics**
- Common Factors analysis initially rejected
 - Court found the analysis does not prove rigidity across job titles (only within them)
- Court also rejected Leamer's "Compensation Movement Charts," (showing movements over time for only 20 job titles, mostly from Technical Class)

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- **Common Wage Structure - Econometrics**
- In supplemental report, Leamer correlated, for each firm:
 - Avg. compensation by job title; and,
 - Avg. compensation for Technical Class (within firm)
- Two sets of correlations:
 - Compensation levels (long-term movements)
 - Year-to-year changes (short-term)
- “Vast majority” of Technical Class job titles positively correlated with Technical Class average

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- **Common Wage Structure - Econometrics**
- Leamer also regressed job title compensation on several factors, including
 - Average Technical Class compensation (current year)
 - Average Technical Class compensation (prior year)
 - Firm revenue; Firm job growth; Local economic conditions
- “Vast majority” of class belong to job titles that showed Correlation between job title salary and average salary in current year, and prior year’s average

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Defendant Critiques**
- Compensation highly individualized; set by hundreds of managers, responsible for tailoring pay by rewarding high-achievers
- Court unpersuaded:
 - “the evidence now suggests that internal equity was such an important aspect of Defendants’ compensation practices that: (1) Defendants utilized software tools to generate internal equity reports and to compare each employee to his or her peers; (2) Defendants advised managers that internal equity was a prime consideration when setting and adjusting salaries; and (3) Defendants actively monitored their compensation structure to identify discrepancies within and beyond job titles and groups and to make adjustments as necessary”
-*Class Cert Order* at 66.

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **More Defendant Critiques**
- Leamer's correlation and regression analyses improperly rely on average compensation for job titles
 - “[b]y averaging the compensation of all employees who hold the same job title ...[Dr. Leamer] necessarily wipes out the very thing he is supposed to be measuring—the significant variation in individual employees’ compensation.” - Suppl. Opp’n at 5
- Rejected again:
 - Averaging does not mask variation across job titles (only within)
 - Common factors analysis (non-averaged, employee-specific), shows 90% of variation explained by common factors (mostly job title) *Class Cert Order* at 71 – 72

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **More Defendant Critiques**
- Regressions suffer from endogeneity problem: An omitted variable correlated with both
 - Job title compensation
 - Firm-wide average compensation (Leamer's key independent variable)
- Rejected by Court for lack of specificity:
 - Defendants failed to identify any omitted variable
 - Failed to explain/show how including the omitted variable would alter Leamer's results

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **More Defendant Critiques**
- Statistical evidence is not proof of causation; fails to show that “ compensation for class members was so rigidly interlinked that a wage increase for some would cause a wage increase for substantially all.”
- Suppl. Opp’n at 14
- Rejected by Court in light of documents:
 - “The Court finds persuasive Dr. Leamer’s statement that economists ‘analyze correlations, which are routinely used...to draw causal conclusions when supported by compelling frameworks and complementary information.’ ”
– *Class Cert Order* at 75.

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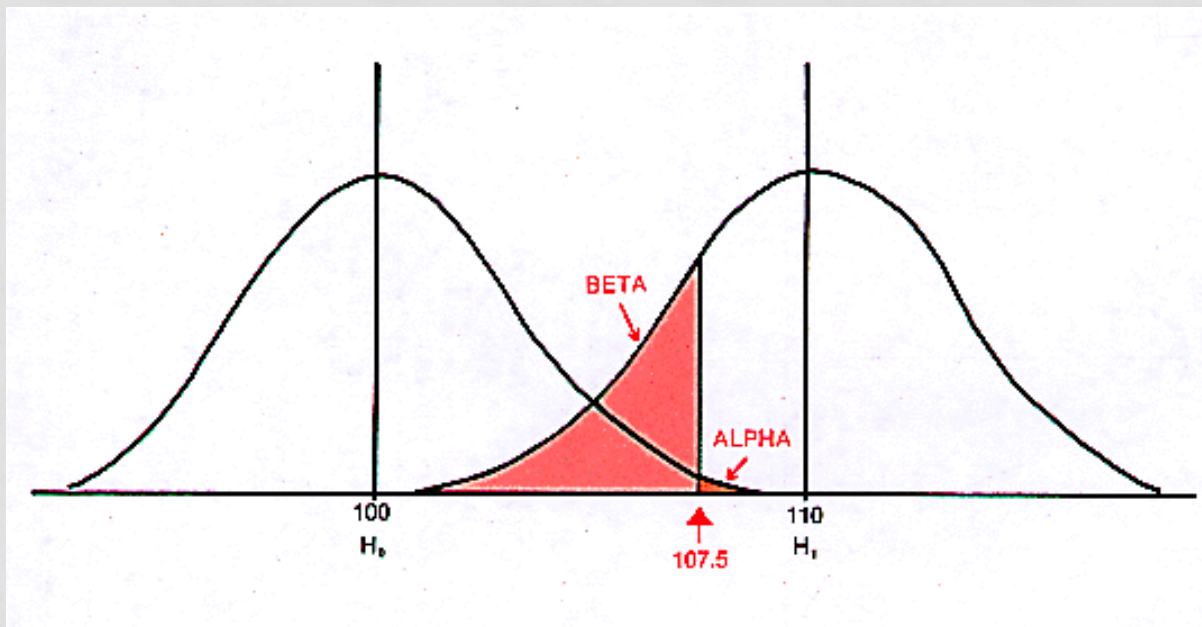
- **1st *Daubert* Challenge**
- Defense: Leamer's (original) conduct regression should have utilized "clustered standard errors"
- With this correction, conduct variable not statistically significant at conventional levels (1%, 5%, 10%)
 - "Null hypothesis" Compensation unaffected by conduct;
 - If true, Leamer's estimates would still occur more than 10% of the time due to random chance
 - Leamer unable to estimate conduct coefficients "with sufficiently reasonable precision to conclude their true value — or the impact of the challenged agreements — is different from zero." - *Leamer Mot. at 7*

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **1st *Daubert* Challenge**
- While acknowledging “ ample evidence ” that these three levels are conventional among statisticians, Court found issue goes to weight, not admissibility
 - Scholarly/expert evidence that conventional significance levels “ should not be blindly applied in every case ”
 - Lack of precedent: “ Defendants have not cited, nor has this Court found, any case holding that a regression model must reject a null hypothesis of zero effect at least at the 10% significance level in order to be admissible. ”

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- 1st *Daubert* Challenge
- Nothing magical about conventional thresholds
 - Tradeoff: Decrease *alpha* (chance of Type I Error) → Increase *beta* (chance of Type II Error)



IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **2nd *Daubert* Challenge**
- Conduct regression cannot distinguish effect of Challenged Conduct from other unilateral conduct agreements
 - (“To the extent that these [other cold-calling restrictions] are coincident in time with . . . these [challenged] bilateral agreements they had, and to the extent that they suppress wages during that period of time, it’s going to be picked up by the conduct variable[.]”)
- *Leamer Dep. At 340*
- Rejected:
 - “the rationale underlying Defendants’ argument—that *Comcast* holds that a damages model must precisely segregate out effects of every possible factor, including legal conduct, that could impact the dependent variable, in order to be admissible under *Daubert*—directly contravenes well established Supreme Court and Ninth Circuit authority holding that damages in antitrust cases often cannot, and therefore need not, be proven with exact certainty.” – *Order Re: Motion to Exclude at 33*

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **3rd *Daubert* Challenge**
- Leamer includes “total new hires” in Conduct Regression to control for overall labor demand across all Defendants; Defense argues inconsistent with theory of harm; should be excluded per *Comcast*
- Court unconvinced:
 - “Defendants have failed to explain, both in their briefing and at the hearing, why and how Dr. Leamer’s inclusion of an aggregated total new hires variable in his model means his model is “inconsistent” with this allegedly logical implication of Plaintiffs’ theory.”

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- 4th *Daubert* Challenge
- “ Dr. Leamer cannot rely on his conduct regression to establish the existence of classwide impact when he admits the model is incapable of showing that each class member was injured.”
- Rejected; mischaracterization:
 - “ Defendants’ argument fails because their main basis for exclusion hinges on a misleading characterization of Dr. Leamer’s opinion regarding impact.” \
 - Conduct Regression designed to show general effects
 - One part of two-step proof

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- **Takeaways**
- Monopsony claims may be found amenable to common proof, even w/o explicit wage-fixing
- Plaintiffs can exploit data-rich environment to show (1) overall effects; (2) pricing structure
- May be a mistake for Defense to rely too heavily on general methodological critiques
 - Significance levels, clustered standard errors and the like can be argued from either side
 - Vague claims of endogeneity ineffectual
 - Qualitative tales of individualized compensation structures may not defeat data analyses & contemporaneous documents

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Alternative Defense Strategies**
- Use benchmarking to undermine first prong of impact proof (before-after analysis)
- Plaintiffs theory implies high-tech salaries & employment suppressed in relevant labor market
- Compare pay & hiring at Defendants with those in control market
 - Other countries? Other industries?
 - Finding that either benchmark moved in wrong direction would undermine Plaintiffs 1st prong of impact proof
 - Even without a control group, Leamer's before-after model could be modified such that employment is the dependent variable
 - Did Defendants' pace of hiring rise or fall after joining alleged conspiracy?
 - Absence of output effect → Absence of harm

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Alternative Defense Strategies**
- Leamer's key relationship: Average job-title compensation "explained" by firm average
 - Point out that the "independent" variable (firm average) is endogenous by construction
 - To identify omitted variables, ask Defendants for contemporaneous evidence on drivers of job-title fluctuations in compensation during the Class Period (and hence the firm-wide average)
 - Surely alleged conspiracy does not explain everything
 - The more omitted variables are added to regression, the less likely Leamer's key relationship will weaken or disappear
 - Weakens or eliminates proof of rigid pricing structure

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Alternative Defense Strategies**
- Use sensitivity analysis to bolster empirical relevance of endogeneity problem
- Standard econometrics: Endogeneity in even one independent variable generally contaminates estimates for all other independent variables with which it is correlated
 - Holds whenever independent variables are correlated
- By interacting firm-wide averages with other control variables, Leamer multiplies potential for a complex & pervasive web of bias in his estimates – including effect of conduct
- Sensitivity analysis can reveal severity of bias, given plausible assumptions on the degree of correlation between observed and unobserved drivers of compensation
- Again, undermines 2nd prong of Plaintiffs' proof

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIG

- **Alternative Defense Strategies**
- Show Leamer's conclusions fail under more rigorous empirical approach to assessing impact
- Caves & Singer (2014): Before/after approach can be made specific to job category, or individual class member