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MONOPSONY IN THE LABOR MARKET: NEW EMPIRICAL RESULTS AND NEW PUBLIC POLICIES

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ABSTRACT

This paper summarizes the results of nearly a dozen new papers presented at the Sundance Conference on Monopsony in Labor Markets held in October 2018. These papers, to be published as a special issue of the Journal of Human Resources, study various aspects of monopsony and failures of competition in labor markets. It also reports on the new developments in public policies associated with widespread concerns about labor market competition and efforts to ameliorate competitive failures. The conference papers range from studies of the labor supply elasticity individual firms face to studies of local labor market concentration to studies of explicit covenants suppressing labor market competition. New policies range from private and public antitrust litigation to concerns about the effect of mergers and inter-firm agreements on labor market competition. We provide a detailed discussion of the mechanics of the Silicon Valley High Tech Worker conspiracy to suppress competition based on Court documents in the case. Non-compete agreements, which are not enforceable in three states already, have also come under scrutiny.

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The idea that firms have some market power in wage setting has been slow to gain acceptance in economics. Indeed, until relatively recently, the textbooks viewed monopsony power as either a theoretical curiosum, or a concept limited to a handful of company towns in the past.[1] This view has been changing rapidly, driven by a combination of theoretical innovations, empirical findings, dramatic legal cases, and new data sets that make it possible to measure the degree of market power in different ways. A search of the EconLit database shows that the number of published journal articles mentioning "monopsony" rose from only 2 in the 1980s to 20 in the 1990's; 32 in the 2000's; and to 64 in the 2010's.

This paper summarizes the results of eleven new papers presented at the Sundance Conference on Monopsony in Labor Markets held in October 2018, organized by three of us (Ashenfelter, Farber, and Ransom) and sponsored by the Princeton University Industrial Relations Section. These papers, to be published as a special issue of the *Journal of Human Resources*, are listed in Table 1 and study various aspects of monopsony and failures of competition in labor markets. We also report here on some developments in public policies associated with widespread concerns about labor market competition and efforts to ameliorate competitive failures.

Taken together, the papers presented at the Sundance Conference offer a rich perspective on the current state of research on market power in the labor market. Four of the papers use the framework pioneered by Manning (2003) to estimate the elasticity of labor supply to individual firms. A related paper looks at mobility frictions between cities. Three other papers, building on the "structure-conduct-performance" paradigm of Industrial Organization, relate the level of wages for specific subgroups of workers to measures of the local concentration of demand for their services (measured by the Herfindahl-Hirschman index). Finally, three papers look at the changing legal status of non-compete agreements and the limits of anti-trust policy as a tool to reduce monopsony power.

a. The Elasticity of Firm-specific Supply

Market power in wage setting arises when the labor supply to a given firm (or group of coordinating firms) is less than perfectly elastic. In a purely static world, it seems natural to assume that, outside a company town setting, firm-level supply is infinitely elastic. This is more or less where economists' reasoning stopped until job ladder models started to be taken

[1] This perspective still dominates the Wikipedia entry on monopsony, which states: "Empirical evidence of monopsony power has been relatively limited. In line with the considerations discussed above, but perhaps counter to common intuition, there is no observable monopsony power in low-skilled labour markets in the US." (Accessed September 27, 2021).

seriously as a tool for understanding job mobility. Though researchers had long recognized that turnover rates vary with wages (e.g., Slichter, 1921; Pencavel, 1972) the connection between the elasticities of recruitment and retention, on one hand, and the elasticity of supply that is relevant for a monopsonistic wage setter, on the other, does not seem to have been fully appreciated until the seminal paper by Burdett and Mortensen (1998, first circulated in 1989).[2]

Building on the insights of this model, Manning (2003) presented a simple framework for extrapolating the quit rate elasticity – which can be estimated relatively straightforwardly -- to the overall labor supply elasticity. In the simplest version of this framework, one simply doubles the quit rate elasticity. In a more sophisticated variant, one also takes account of the fact that firms with higher wages tend to recruit a higher fraction of workers from other firms, and a lower fraction from unemployment. Manning's framework provides a tractable method of estimating labor supply elasticities from observed quit and hiring patterns that has been implemented in many different settings.

In their paper "Labor Market Polarization, Job Tasks and Monopsony Power," Ronald Bachmann, Gökay Demir, and Hanna Frings use this approach to provide new estimates of average firm-specific labor supply elasticities for three broad occupation groups in Germany, classified by the types of tasks on their jobs: routine tasks, non-routine manual tasks, and nonroutine cognitive tasks. Consistent with many earlier studies they find that these elasticities are relatively small in magnitude (in the range of 1 to 2.5), with a less elastic supply function for workers in non-routine cognitive occupations.

A concern in studying the effect of wages on turnover rates is that only part of the observed wage is directly attributable to firm discretion. In their paper "Monopsony in Movers: The Elasticity of Labor Supply to Firm Wage Policies", Ihsaan Bassier, Arindrajit Dube, and Suresh Naidu evaluate different approaches to isolating the firm-specific component of wages, using data from the State of Oregon. A first approach uses the estimated firm effects from an Abowd, Kramarz, and Margolis (1999) two-way fixed effects model. This leads to labor supply elasticities that are substantially larger (in the range of 2-3) than those implied by specifications that simply use wages. An implicit assumption in the Abowd et al. specification is that mobility flows are unrelated to the job match component of wages – an assumption that is violated in the Oregon data. Bassier et al. implement an alternative "matched job history" procedure that isolates a firm-wide component of wages by comparing quit rates of people who were coworkers prior to their current job. This yields somewhat larger labor supply elasticities (in the range of 4) that are higher for higher-wage workers, and also vary pro-cyclically.

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[2] One source of confusion is the idea that wage setting depends on the "long run" elasticity of labor supply. For example, in his review of *Monopsony in Motion*, Kuhn (2004) argued: "… the observation that short-run responses of employment to wages are surely not infinite does not shed much light on the central question at hand: what we really care about is the long run, and whether firm-level labor supply curves are effectively horizontal in the long run…".

Douglas Webber, in his paper "Labor Market Competition and Employment Adjustment Over the Business Cycle," uses the massive samples available from the U.S. Census Bureau's Longitudinal Employer Household Dynamics (LEHD) database to estimate firm-specific separation elasticities, and derive firm-specific labor supply elasticities. His estimates, which leverage within-firm variation in wages (as opposed to the between-firm variation used by Bassier et al.) suggest that there is some variation in labor supply elasticities across firms, with a mean centered around 1. Consistent with Bassier et al., he also finds significant pro-cyclicality in firm-specific elasticities.

Urban economists have long argued that labor markets in bigger cities are more "dynamic", leading to more efficient allocations of workers to firms. In the context of a Burdett-Mortensen style job ladder model, such fluidity implies more elastic labor supply functions to individual firms, and higher average wages for workers. In their paper "The Urban Wage Premium in Imperfect Labor Markets," Boris Hirsch, Elke J. Jahn, Alan Manning, and Michael Oberfichtner use data from Germany to test these insights. They show first that average labor supply elasticities (estimated from quit models using Manning's framework, with a mean of around 2.3) vary systematically across labor markets in Germany, with a strong positive relationship between the size of the local market and the labor supply elasticity. They then show that around 40% of the effect of population on mean wages in Germany is explained by the higher labor supply elasticities in larger labor markets.

A key assumption in the work of Hirsch et al. is that a worker's choice of jobs is confined to her local labor market. In the standard Rosen-Roback model that is widely used by urban economists, however, the supply of workers to different cities is assumed to be infinitely elastic – implying that wages in any particular city are determined by national supply and demand factors, rather than by local conditions. Indeed, according to the Rosen-Roback model, even in a company town there is no monopsony power! In his paper "Labor Market Frictions and Moving Costs of the Employed and Unemployed," Tyler Ransom uses longitudinal data from the Survey of Income and Program Participation to examine the sensitivity of inter-city migration flows to local opportunities. Consistent with existing studies of the extent of local labor market competition (e.g., Manning and Petrongolo, 2017) – and in sharp contrast to the assumptions in the Rosen-Roback framework, he finds that implicit moving costs are very large and substantially inhibit migration across cities in the U.S.

b. The Number of Competitors for Labor Services

In thinking about a firm's wage setting power, many analysts turn instinctively to the question of how many other potential buyers are in the market for the same workers. A common perception is that the number of potential employers is large. One of the most surprising findings in the recent literature, however, is that for many workers in many local markets the

number of potential employers is relatively small, particularly when the "market" is defined by actively searching firms. Azar et al., (2020), for example, use data on the near-universe of U.S. vacancy listings to calculate Herfindahl Hirschman Indices (HHIs) for labor markets at the narrowly-defined occupation by commuting zone level. They estimate that an average labor market has an HHI of around 4300 – equivalent to 2.3 equal sized recruiting firms.

In their paper "Labor Market Concentration," Jose Azar, Ioana Marinescu and Marshall Steinbaum use data from a large national employment website to study the relationship between posted wages for jobs in a given occupation and commuting zone and the HHI of employers searching for workers in that occupation and location. They find relatively large negative elasticities of wages with respect to the HHI – on the order of -0.03 in simple OLS models, and -0.13 in models that instrument the HHI in an occupation-location cell with the leave-out mean number of competitors searching for workers in that same occupation in other markets. These elasticities imply that the level of competition for labor services has a sizeable impact on wages, potentially justifying attention to the effects of mergers and acquisitions on labor market competition, as suggested by Naidu, Posner and Weyl (2018).

In "Strong Employers and Weak Employees: How Does Employer Concentration Affect Wages?" Efraim Benmelech, Nittai K. Bergman, and Hyunseob Kim use establishment-level data to measure HHI's of employment at the industry-by-commuting zone level, and relate the indexes to average wages per worker in local establishments. Conceptually their approach differs from that of Azar et al. by focusing on how concentration of the stock of existing employment matches is related to average wages, rather than on how concentration of flows of new job openings is related to posted wage offers for new hires. In OLS models they find a relatively small (-0.01) elasticity of wages with respect to the HHI. When they use merger and acquisition activity to instrument for local HHI's, however, they find much larger elasticities (in the range of -0.03 to -0.06). They also find that the elasticity of wages with respect to measured productivity growth is smaller in more concentrated markets.

In his paper "Labor Market Concentration, Earnings, and Inequality" Kevin Rinz develops measures of labor market concentration similar to those presented by Benmelech et al., but uses individual earnings data (drawn from W-2 tax filings) to study the effects of concentration on wages. An important initial finding is that, on average, measures of local concentration of the stock of employment by industry and commuting zone have declined in the U.S. In OLS models Rinz finds that wages are slightly higher in more concentrated markets, but in models that use the leave-out mean of the HHI for the same industry in other locations as an instrumental variable for local concentration, be obtains elasticities of wages with respect to the HHI in the range of -0.03 to -0.10.

c. The Changing Legal Perspective on Labor Market Competition

In parallel with the rise in research on market power in wage setting, the last decade has witnessed a number of remarkable developments in public policy, laws, and enforcement associated with failures of competition in labor markets. These include antitrust law suits and enforcement actions regarding suppressed competition in labor markets; the banning of "no poaching" clauses in franchise contracts; other legislation affecting "non-compete" and "nonsolicit" clauses in employment contracts; and proposals to incorporate labor market competition metrics in the regulation of mergers.

(i) Silicon Valley No poaching agreements.

The largest and most influential enforcement action and litigation regarding anti-competitive behavior in labor markets concerned "no poaching" and "no solicitation" agreements among Silicon Valley executives affecting software and animation engineers. Universally known as the "High-Tech Employee Antitrust Litigation," the case was initiated by the Department of Justice (DoJ) in 2010 against Adobe, Apple, Google, Intel, Intuit, and Pixar (and subsequently Lucasfilm) under Section 1 of the Sherman Act, alleging that the companies had engaged in a series of bilateral "no cold call" agreements. The parties agreed to a settlement that ended these practices on the same day the case was announced, with no monetary compensation. Subsequently, however, a private antitrust law suit was filed on behalf of software engineers: this settled for $415 million in 2015. Most of what is known about the case comes from the opinion of Judge Lucy Koh in certifying the class of employees affected by the no-poaching agreements in the private case.[3] Since the details of the conspiracy provide several interesting insights into non-competitive behavior, we provide a brief overview here.

Judge Koh wrote that "Plaintiffs evidence indicates that the roots of Defendants conspiracy appear to reach back to the mid-1980s, shortly after George Lucas (former Lucasfilm CEO) sold Lucasfilm's computer division...to Steve Jobs (former Apple CEO), who then renamed the division 'Pixar'." To avoid, as George Lucas described it, "a bidding war with other companies," Lucasfilm and Pixar agreed (1) not to "cold call" each other's employees; (2) to notify the other company should they receive an application for employment; (3) and that all offers to employees at the other company would be "final," with no further bidding. It was not long before this agreement was extended by Steve Jobs to Apple and its labor competitors. Judge Koh quotes the Head of Apple Human Resources: "add Google to your 'hands-off' list. We recently agreed not to recruit from one another so if you hear of any recruiting they are doing against us, please be sure to let me know."

[3] Specifically, the judge's order granting, in part, class certification (Document 531) of the case in the Northern District of California, Case 5:11-cv-02509-LHK.

Figure 1 shows a diagram of the ultimate group colluding to suppress competition. As the diagram shows, there were overlapping spokes to the conspiracy. One involved the animation business while the other included a broad list of Silicon Valley firms employing software engineers.

Enforcement of the agreements was also evident. Judge Koh cites one instance in which Steve Job informed Eric Schmidt (then CEO of Google) that a Google recruiter had contacted an Apple employee. Jobs wrote: "I would be very pleased if your recruiting department would stop doing this." Judge Koh notes that "Google responded by making a 'public example' out of the recruiter and terminating the recruiter within the hour."

Although not all the firms that were approached joined the conspiracy (Palm, Inc. was a notable example) many did. Moreover, it is apparent that at least some of the participating executives were aware of the potential illegality of the agreements. In 2005 a Google executive created a draft formal list of "do not cold call" companies. Judge Koh writes (p. 27), "The draft was presented to Google's Executive Management Group, a committee consisting of Google senior executives Eric Schmidt, Larry Page and Sergey Brin (Google co-founders), and Shona Brown. Eric Schmidt approved the list. When Shona Brown asked Eric Schmidt whether he had any concerns with sharing information regarding Google's 'Do Not Call' list with Google's competitors, Eric Schmidt said that he preferred that it be shared ‘verbally, since I don't want to create a paper trail over which we can be sued later.' "

Judge Koh’s decision does not explicitly describe the factors that ended the Silicon Valley conspiracy. She notes that by March of 2008, 20 years after the conspiracy’s origin, Facebook was growing quickly and Google (p. 78) "discovered **non-party** Facebook had been cold calling into Google's Site Reliability Engineering team..." The executive who discovered this poaching behavior "suggested contacting Sheryl Sandberg (Chief Operating Officer at Facebook) in an effort...to consider establishing a mutual 'do not call' agreement ..." Judge Koh writes that despite this effort, in August 2008, "Facebook continued to poach Google's employees... Accordingly, in October 2010, Google began studying Facebook's solicitation strategy. A month later (and two months after the DoJ made public its investigation of the Defendants) Google announced its 'Big Bang,' which involved an increase in the base salary of *all* [emphasis in the original] its salaried employees by 10% and provided an immediate cash bonus of $1,000 to all employees. "

It appears that a combination of competition from Facebook and the DoJ investigation led to the unravelling of the conspiracy. Determining their separate effects, if indeed they are separate, is probably impossible.

(ii) Mergers and Labor Market Concentration

Subsequent to the High-Tech case, a second private antitrust case was launched over the related conspiracy affecting animation engineers, shown in Figure 1. (Full disclosure: Ashenfelter was an expert witness for the plaintiffs in this litigation). This case was ultimately settled in 2018 for $170 million. Interestingly, between the time of the conspiracy and the ultimate settlement, both Pixar and Lucasfilm were purchased by Walt Disney Co., which was also a defendant in the litigation. Once these three firms were consolidated the practices that were the basis for the litigation would be legal, as they would take place within the single, larger entity. This consolidation arguably has led to a rise in the labor market power of the remaining firms in the animation industry, which the studies by Azar et al., Benmelech et al., and Rinz all suggest may have led to lower wages for animation engineers.[4]

The US competition authorities, the DoJ and the Federal Trade Commission (FTC) have begun investigating these issues. Whether public policy toward mergers and their effect on labor market competition, which is governed by the regulatory authority enabled by Hart-Scott-Rodino Act, will change is unclear.

In their paper "Labor Monopsony and the Limits of the Law," Suresh Naidu and Eric Posner provide an extensive review of models of monopsonistic competition, then address the question of whether, in light of those models, anti-trust policy alone can remedy the problem of market power in wage setting. They summarize Cournot-style models of labor quantity competition, search models based on Burdett and Mortensen (1998), models based on differentiated firm-specific amenities (Card et al., 2018), and recent extensions of that framework that separate within-market and between-market supply behavior (e.g., Berger et al, 2019; Manning, 2021). They conclude that employer concentration is not the only factor (or even the main factor) driving a wedge between wages and productivity, and review alternative public policies such as minimum wages, tax and transfer programs, and policies to enhance the power of unions.

(iii) Franchise No-Poaching Agreements

In their paper “Theory and Evidence on Employer Collusion in the Franchise Sector,” Orley Ashenfelter and Alan Krueger document the existence of explicit contractual no poaching clauses that have existed in many franchise agreements until recently. These agreements typically prohibit a franchisee from hiring another franchisee's employees for some prespecified

[4] A recent study by Arnold (2020) provides evidence that mergers and acquisitions that lead to further concentration of hiring in already-concentrated labor markets are associated with significantly lower wages.

period of time after an employee's departure. As the paper shows, these clauses existed in about half of franchise agreements, but were not universal.

Subsequent to the circulation of this paper, and as a direct result of it, enforcement actions to eliminate these clauses were initiated by the Attorney General of the State of Washington. At this time, despite litigation that continues over past behavior, franchise contracts in Washington State (and many other states) no longer contain these no-poaching clauses. There remains the legal question of whether these clauses are per se illegal, but this is perhaps a moot issue at this point.

(iv) Non-compete Contracts

Non-compete contracts (or "covenants not to compete") are agreement that forbid a worker from subsequently taking employment with a firm's competitors for a specified period. Public policy regarding such contracts is highly fragmented, as state laws are the primary regulation. Some states (California, Oklahoma, North Dakota) prohibit enforcement of these contracts. Other states permit their enforcement with some restrictions; still others permit unfettered enforcement. A very recent Executive Order from the President in July 2021 ("Promoting Competition in the American Economy") directs the FTC to consider enforcing limitations on non-compete contracts using statutes already available. It also instructs the FTC and DoJ to reconsider their guidance to human resource professional regarding the sharing of wage and benefit information.

In their paper "Locked In? The Enforceability of Covenants Not to Compete and the Careers of High-Tech Workers," Natarajan Balasubramanian, Jin Woo Chang, Mariko Sakakibara, Jagadeesh Sivadasan, and Evan Starr study how non-compete contracts affect mobility rates and wages of technology workers. Their first research design focuses on a 2015 law in Hawaii that banned covenants not to compete for technology workers only. A second design focuses on cross-state differences in an index devised by Starr (2019) of enforceability of covenants not to compete. Using both designs they find that firm-to-firm mobility rates of technology workers are reduced in times/places when non-compete agreements are relatively enforceable. They also find that their wages are reduced at both early and later career stages. These findings suggest that non-compete contracts act like restraints on worker supply to alternative employers, leading to increased (dynamic) monopsony power.

d. Concluding Remarks

The research reviewed here is a testament to the increased interest in the role of competition in labor markets and the potential role for models of monopsony. And the renewed public interest in employer market power and monopsony attest to the broader issues related to

wage stagnation that currently confront public policy. Indeed, the demand for new policies to address employer market power may arrive before the research to fully rationalize them has been completed. This suggests that future research on the role of competition in labor markets should be a high priority.

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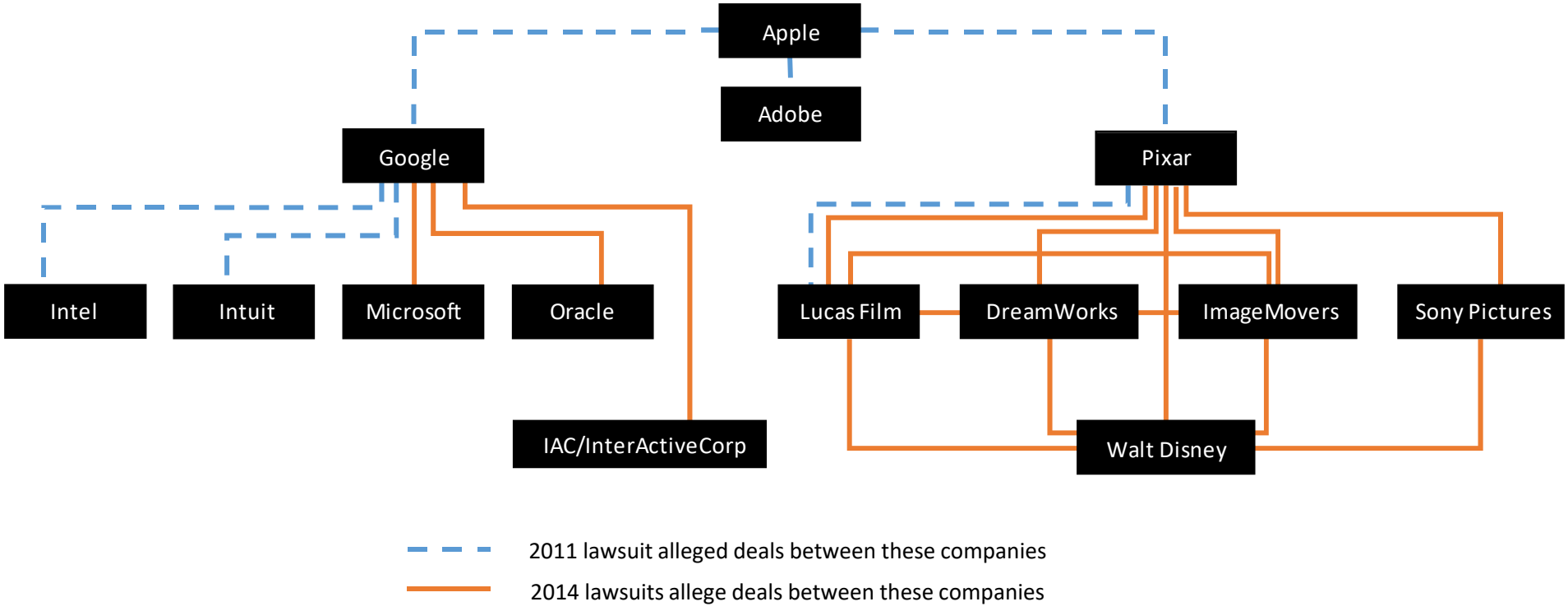

Sources: Based on data from lawsuits filed the Northern District of California and Bloomberg Graphics.

Figure 1: Firms Involved in High-Tech Employee Antitrust Litigation