
Munich Personal RePEc Archive

Startup Noncompetes in the Shadow of Acquihiring

Tsubuteishi, Kyogo

Graduate School of Economics, Hitotsubashi University

14 March 2025

Online at https://mpra.ub.uni-muenchen.de/123852/
MPRA Paper No. 123852, posted 15 Mar 2025 08:03 UTC

Startup Noncompetes in the Shadow of Acquihiring*

Kyogo Tsubuteishi†

March 14, 2025

Abstract

Non-compete agreements (NCAs) restrict employee mobility and often play important roles in startups, such as preventing leakage of intellectual property. In this article, I propose an additional role of NCAs in startups as a potential countermeasure to acquihiring by developing a model of labor market competition between a potential acquirer and a startup. In the model, the potential acquirer has two options to hire the startup's employee, direct hiring (poaching) and acquihiring — the acquisition of a company to hire its talented employees. NCAs may either induce or prevent acquihiring by affecting the profitability from each hiring strategy for the potential acquirer. I identify the conditions under which NCAs prevent acquihiring and demonstrate that stricter NCA regulation may distort worker allocation and/or reduce worker welfare. This result indicates that, in the context of high-tech industries where acquihiring is relatively prevalent, increased regulation of NCAs could weaken startups, facilitate acquihiring by Big Tech firms, and ultimately reinforce their market power.

Keywords: non-compete agreement, startup, acquihiring, labor mobility, monopsony, antitrust implications, welfare consequences, waterbed effect

JEL Codes: J42, L13, M12, K21, K31

*I would like to express my sincere gratitude to Susumu Sato for his invaluable advice and continuous support. I am also deeply grateful to Hiroshi Kitamura, Noriaki Matsushima, and Hodaka Morita for their detailed comments. I would also like to thank Anna Imai, Akifumi Ishihara, Daiji Kawaguchi, Daiki Kishishita, Yuta Kittaka, Volker Nocke, Hideo Owan, Katsuya Takii, and Yusuke Zennyo as well as other conference and seminar participants at the 27th Labor Economics Conference, the 2024 Autumn Meeting of the Japan Association for Applied Economics, the Applied Regional Science Conference 2024, the 36th Economics Workshop for Young Economists, Hitotsubashi University, Waseda University, and Tokyo University of Science. This work was supported by the Joint Usage / Research Center, Institute of Economic Research, Hitotsubashi University (Grant ID: IEPRK2431).

†Graduate School of Economics, Hitotsubashi University, Tokyo, Japan.
E-mail: kyogo0517md@gmail.com

1 Introduction

In this article, I examine two practices in labor markets: non-compete agreements (NCAs) and acquihiring. NCAs are a type of contractual restraint that prevents employees from moving to the employer's competitor, and acquihiring is the acquisition of a company to hire its talented employees. Both types of practices are considered potentially anticompetitive, and policymakers worldwide seek ways to regulate these practices. I explore the relationship between NCAs and acquihiring by analyzing how the enforceability of NCAs affects the realization of anticompetitive acquihiring.

NCAs have been important for some industries, including the high-tech sector, but they are also potentially anticompetitive. For example, NCAs can often serve as a legal mechanism to protect firms' explicit or tacit knowledge by restricting the job mobility of employees with technical expertise (Kräkel and Sliwka, 2009).[1] At the same time, however, NCAs are also seen as an anticompetitive practice that bolsters monopsony power over employees, exemplified by a final rule issued by the Federal Trade Commission (FTC) establishing a nationwide ban on NCAs.[2]

Over the past two decades, acquihiring has emerged as a novel acquisition practice among established technology firms in which the main goal of the acquisition is to obtain a startup's human capital (Boyacıoğlu, Özdemir and Karim, 2024).[3] Industry members and observers have argued that such acquisitions are motivated not by a desire to "kill" product market competition but instead reflect big firms' hiring strategies (Barnett, 2023). Actually, case studies do not support the position that the key motivation for acquihiring is to kill the competition (Chatterji and Patro, 2014; Coyle and Polsky, 2013). However, Bar-Isaac, Johnson and Nocke (2024) theoretically show that acquihiring can be understood as a means of bolstering monopsony power in the specialized *labor* market.

Why does a potential acquirer purchase the entire startup instead of individually hiring away talented employees? Boyacıoğlu et al. (2024) cite the existence of NCAs as one of the reasons. Chen, Gao and Ma (2021) appear to offer the first causal evidence related to acquihiring. Their finding implies that firms acquihire when poaching workers is more costly. Chen, Hshieh and Zhang (2024) empirically find that firms facing legal barriers to poaching workers are more likely to respond to shortages of high-skilled workers by

[1]For other benefits of NCAs for startups, see, for example, Balasubramanian, Chang, Sakakibara, Sivadasan and Starr (2022), Starr, Balasubramanian and Sakakibara (2018), Klein (1998), Starr (2019), Jeffers (2024), Johnson, Lipsitz and Pei (2023), US-Treasury (2016), Coyle and Polsky (2013) and Marx, Strumsky and Fleming (2009).

[2]Two FTC commissioners issued dissenting statements against the final rule, which treats NCAs as categorical, or *per se*, violations of FTC Act Section 5. In their statements, they argue that empirical evidence does not support the final rule's broad reach and advocate for the application of the rule of reason in NCA regulations. Actually, on August 20, 2024, the U.S. District Court for the Northern District of Texas invalidated the FTC's final rule. The district court opinion specifically criticized the FTC's "one-size-fits-all" approach. See https://www.wiley.law/alert-Texas-Federal-District-Court-Sets-Aside-Federal-Trade-Commission-Non-Compete-Ban-Nationwide? (retrieved on December 9, 2024).

[3]For instance, consider Google's 2012 acquisition of Milk in which Google wanted to acquihire a team of talented designers. Post-acquisition, Google shut down Milk's Oink app (Boyacıoğlu et al., 2024). See Appendix A of Boyacıoğlu et al. (2024) for other cases of acquihiring.

acquihiring. According to their arguments, NCAs are detrimental not only because they restrict labor mobility but also because they induce acquihiring. However, in this article, I argue that NCAs may actually prevent acquihiring, thereby improving worker allocation and worker welfare.

This article explores a model of labor market competition with the possibility of acquihiring, based on Bar-Isaac et al. (2024). In the model, there are three players: a startup (firm s), a potential acquirer (firm a) and an employee. The employee is initially hired by firm s and enjoys additional benefits only there but may have greater productive value at firm a. Firm s can offer an NCA to its employee. With respect to the NCA, the employee has no bargaining power at all, and thus the offer is a take-it-or-leave-it offer. Even if the offer is accepted, the NCA is not necessarily enforced by a court; rather, its enforcement occurs only with some probability. Firm a may attempt to poach the employee directly (direct hiring) or first acquire firm s and then make a wage offer (acquihiring). If firm a chooses direct hiring, wage-bidding occurs unless the NCA is enforced, in which case the enforcement allows firm s to become a monopsonist. If instead firm a chooses acquihiring, acquisition bargaining takes place, which is modeled as Nash bargaining.

In this model, when the enforcement probability is high, firm a chooses acquihiring over direct hiring because the firm will fail to directly hire the employee with high probability. When the probability is not too high, firm a may choose direct hiring over acquihiring and the firm's hiring strategy depends on the value generated by the employee at the firm. If the NCA is not enforced and firm a hires the employee through direct hiring, the firm pays a competitive wage independent of the value, enabling the firm to capture all gains from the increase in the value. In contrast, if firm a hires the employee through acquihiring, the firm pays a portion of the value to firm s in the process of acquisition bargaining, hence firm a does not capture all of the increased value. Therefore, if the value is sufficiently high, firm a prefers direct hiring over acquihiring. Regarding the feasibility of the acquisition, higher generated value leads to a larger joint payoff for the two firms post-acquisition, thereby making the acquisition more likely. Taken together, firm a chooses acquihiring when the value is intermediate.

The equilibrium worker allocation can be socially inefficient for two reasons. First, neither firm s nor firm a internalizes the loss incurred by the employee due to the restriction of labor market competition resulting from acquisition in acquisition bargaining. This negative externality for the employee leads to inefficient acquihiring. Second, firm s does not internalize the losses experienced by firm a and the employee due to the NCA when deciding whether to offer it to her. These negative externalities for firm a and the employee lead to inefficient employee retention.

I conduct comparative statics with respect to the enforcement probability. An increase in the probability reflects the relaxation of restrictions on NCAs. Intuitively, it lowers the likelihood of direct hiring as a consequence of the NCA itself, thereby leading to inefficient employee retention that may distort the worker allocation and/or the restriction on job mobility that reduces worker welfare.

In addition, there are two less-recognized effects of the relaxation of restrictions on NCAs. First, it grants firm s monopsony power over its employee, increasing firm s's outside payoff in acquisition bargaining and thus making it harder to reach a deal. As a result, it may prevent inefficient acquihiring caused by the negative externality arising in acquisition bargaining, thereby improving the worker allocation. Furthermore, preventing acquihiring promotes labor market competition and thus improves worker welfare. Also, even if acquihiring is not prevented, it increases the acquisition price, benefiting firm s. In these ways, NCAs may serve as a countermeasure to acquihiring. Second, it raises the probability that firm a fails in direct hiring, making acquihiring a relatively more attractive hiring strategy. This may induce acquihiring and thereby prevent inefficient employee retention that arises from the NCA, consequently improving the worker allocation. However, as acquihiring impedes labor market competition, it reduces worker welfare.

Finally, I examine a worker-welfare-maximizing competition authority, which can choose the enforcement level to maximize worker welfare. NCA regulation aimed at addressing restrictions on employee mobility may induce acquihiring (waterbed effect) and paradoxically reduce worker welfare. Hence, the competition authority chooses the lowest enforcement level possible that can still prevent acquihiring.

This article contributes to the literature on the welfare impacts of NCAs. The novelty of the present article lies in exploring a model that captures the impact of NCA regulation on the realization of acquihiring within a single theoretical framework. By doing so, I demonstrate that NCAs have not only negative effects but also positive effects on worker allocation and worker welfare by affecting the realization of acquihiring. Previous theoretical analyses have also suggested the positive effects of NCAs, such as promotion of firm-sponsored training (Posner, Triantis and Triantis, 2004; Shy and Stenbacka, 2023).[4] Closer to the present article, Mukherjee and Vasconcelos (2012) contend that partially permitting NCAs might render no-poaching agreements (NPAs) infeasible, thereby improving worker allocation and enhancing both social and worker welfare. The present article and Mukherjee and Vasconcelos (2012) differ in the focus although the qualitative implications for the welfare impacts of NCAs are similar.

This article also contributes to the literature on startup acquisitions, a field with emerging theoretical work.[5] It is most closely related to Bar-Isaac et al. (2024), which my model builds on. They develop a tractable model of startup acquisitions that explains why a firm engages in acquihiring instead of directly poaching a valuable employee and show that the goal of acquihiring might be to eliminate competition for a startup's employee. In the present article, I introduce an NCA into the model and illustrate that startups may use NCAs as a countermeasure to acquihiring. This role also enriches antitrust implications. I show that NCA regulation could undermine startups, facilitate acquihiring by Big Tech

[4] Battiston, Espinosa and Liu (2024) suggest that NCAs may eliminate inefficient job rotation as a tool to deter poaching by hindering workers' acquisition of client-specific skills.

[5] See, for instance, Benkert, Letina and Liu (2023), Cabral (2021), Cabral (2023), Fumagalli, Motta and Tarantino (2022), Katz (2021), Letina, Schmutzler and Seibel (2024) and Motta and Peitz (2021).

firms, and potentially increase their market power.

The rest of this article is organized as follows. Section 2 presents my model of labor market competition with the possibility of acquihiring. Section 3 analyzes the model to characterize the equilibrium, examines how the relaxation of restrictions on NCAs affects the realization of acquihiring and considers a worker-welfare-maximizing NCA regulation. Section 4 discusses the policy implications of the model. Section 5 summarizes and concludes the article. All the proofs are relegated to the Appendix.

2 Model

I consider a model of labor market competition in which two firms, a startup and a potential acquirer, compete for a worker who is initially employed by the startup.

2.1 Players

In the model, there are three players: a startup (firm s), a potential acquirer (firm a) and an employee who is initially hired by the startup. The employee is essential for running firm s: she generates a value of v_s to the firm. If the employee switches to firm a, she generates a value of v_a to that firm.[6] When working for firm $i \in \{a, s\}$, she receives a wage payment w_i; when working for firm s, she gets additional benefits, $b > 0$, which may reflect the benefits from established personal networks within the startup, as well as savings in switching costs associated with job changes.[7] I assume that all players are risk neutral. The employee's outside payoff is w^o, which can be interpreted as the highest wage offer from competitive firms other than firm s and firm a. In the following, I assume that $\min\{v_a, v_s\} > b + w^o$ to ensure that the employee chooses to work for one of the two firms in equilibrium.

2.2 Non-compete agreements

Firm s can offer an NCA to its employee. Regarding the NCA, the employee has no bargaining power at all, and thus the offer is a take-it-or-leave-it offer.[8] If the employee rejects the offer, she leaves the firm, and firm a cannot find her. As a result, she has no option but to take the outside option and receive w^o. Even if she accepts the offer, the NCA is not necessarily enforced by a court. The probability of it being enforced is

[6] NCAs are likely to be more relevant when the firms also compete in the product market. v_s and v_a can be interpreted as the magnitude of the reduction in marginal costs that each firm can achieve by hiring the employee, assuming that the two firms engage in Bertrand competition in the product market.

[7] In Bar-Isaac et al. (2024), the benefits b are interpreted as follows. "The benefits b may reflect knowledge workers in startups are often invested and take pride in their employer's mission and see their work for the "right" startup as a vocation. It may also include the excitement, opportunities, work environment, and status associated with working in a non-hierarchical and innovative company where the employee is essential."

[8] This issue of bargaining power is briefly discussed in Section 4.

denoted by p.[9] I interpret this probability as the breadth of the legally recognized scope of NCAs.[10] In practice, the scope of many NCAs is often restricted by geographic and/or temporal limitations.[11] $p = 0$ indicates a complete ban on NCAs. In contrast, $p = 1$ signifies complete acceptance of NCAs.

2.3 Potential acquirer's hiring strategies and wage competition

Firm a has two options to hire the employee, which I call direct hiring and acquihiring. If firm a chooses direct hiring, then the validity of the NCA, if any, is revealed, and the firm competes with firm s (wage-bidding) unless it is valid. In wage-bidding, both firms simultaneously make wage offers w_a and w_s to the employee, and she chooses either to accept one of the offers or to reject both. If the NCA is valid, firm a fails to directly hire the employee and cannot approach her afterward.[12] Then, only firm s makes a wage offer w_s, and the employee decides whether to accept it or not.

If instead firm a chooses acquihiring, acquisition bargaining takes place. The process is modeled as Nash bargaining. The firm has bargaining power α. If the bargaining succeeds, only firm a makes a wage offer w_a, and the employee decides whether to accept it or not. In the event that acquihiring fails, firm a engages in direct hiring with probability δ. This probability can be interpreted as reflecting delay and discounting.[13] If firm a cannot engage in direct hiring, only firm s makes a wage offer w_s, and the employee decides whether to accept it or not. If firm a can engage in direct hiring, the game proceeds as in the case where the firm chooses direct hiring. Denote the continuation (outside) payoff of firm a and firm s by t_a and t_s, respectively. Acquihiring firm s itself does not confer any benefits on firm a over and above the value generated by the employee, v_a.

I assume the tie-breaking rule that when firm a is indifferent between the two hiring strategies, the firm chooses direct hiring.

2.4 Timeline

The timing of this game is summarized as follows.

[9] As an alternative modeling approach, I could consider a situation where a startup imposes a clause requiring an employee to pay a breakup fee upon changing jobs, with an exogenously determined cap on the amount. Even in such a case, the main message of this article remains unchanged.

[10] In the majority of states in the United States, NCAs are allowed so long as the scope of the restrictions is reasonable. See https://www.law.cornell.edu/wex/covenant_not_to_compete (retrieved on September 13, 2024).

[11] For instance, an agreement may specify the employee cannot work for a competitor within a 25-mile radius of the employer's location. A software engineer may sign an NCA that bars her from working at another software company in the financial technology sector for 18 months after leaving her employer. See https://leaders.com/articles/hiring/non-compete-agreement/ (retrieved on September 12, 2024).

[12] This assumption may seem restrictive. However, even if the model is modified to allow acquihiring after the failure of direct hiring, the main message of this article remains unchanged.

[13] This interpretation is presented in Bar-Isaac et al. (2024).

- Stage 1: Given the probability of the NCA being enforced, p, firm s decides whether to offer the NCA to its employee. If she rejects the offer, the game ends. Otherwise, the game proceeds to Stage 2.
- Stage 2: Firm a chooses whether to engage in direct hiring or acquihiring. If the firm chooses acquihiring, the game proceeds to Stage 2.1. Otherwise, the game proceeds to Stage 3.
  - Stage 2.1: Nash bargaining takes place. If the bargaining succeeds, only firm a makes a wage offer to the employee. She decides whether to accept it or not and the game ends. Otherwise, the game proceeds to Stage 2.2.
  - Stage 2.2: Firm a engages in direct hiring with probability δ. If the firm cannot engage in direct hiring, only firm s makes a wage offer to the employee. She decides whether to accept it or not and the game ends. Otherwise, the game proceeds to Stage 3.
- Stage 3: The validity of the NCA, if any, is revealed. If it is valid, only firm s makes a wage offer to the employee. She decides whether to accept it or not and the game ends. Otherwise, the game proceeds to Stage 3.1.
  - Stage 3.1: Wage-bidding takes place. Both firms simultaneously make wage offers to the employee. She chooses either to accept one of the offers or to reject both and the game ends.

I use the Subgame Perfect Nash Equilibrium as a solution concept. I detail further equilibrium selection in the wage-bidding subgame in Section 3.1. Given the above description of the model, I now highlight how the relaxation of restrictions on NCAs affects the realization of acquihiring.

3 Analysis

3.1 Equilibrium Characterization

I now move on to the equilibrium analysis of the model described in the previous section. In my model, it is always profitable for firm s to offer the NCA to its employee because I do not take into account the consideration for the NCA and the process for the firm to hire the employee initially. Hence, in the following, I proceed with the analysis given that the NCA exists. I solve the model by backward induction.

At first, consider the wage-bidding subgame. As firm s is willing to pay up to v_s to retain the employee, and the employee enjoys the benefits b only at firm s, direct hiring

will succeed only if $v_a \geq v_s + b$. Similarly, as firm a is willing to pay up to v_a, the following result is immediate.[14]

Lemma 1. *Suppose wage-bidding takes place. Then, in the equilibrium of this subgame:*

- *if $v_a > v_s + b$, firm a hires the employee at wage $w_a = v_s + b$;*
- *if $v_a < v_s + b$, firm s retains the employee at wage $w_s = v_a - b$.*

The resulting outcome is efficient in that it maximizes social welfare.

Suppose firm a has chosen direct hiring. With probability $1-p$, the NCA is not valid. In this case, the analysis is exactly as in the aforementioned wage-bidding subgame, and Lemma 1 applies. With probability p, the NCA is valid. In this case, firm s becomes a monopsonist over its employee, and thus she is retained by the firm at a monopsonistic wage of $w^o - b$. Hence, firm a's expected payoff in choosing direct hiring π_a^D is given by

$$\pi_a^D = \begin{cases} (1-p) \times [v_a - (v_s + b)] & if\ v_a > v_s + b; \\ 0 & if\ v_a < v_s + b. \end{cases}$$

Now suppose instead that firm a has chosen acquihiring. If the firm chooses to engage in acquihiring but it does not take place, then with probability δ, the ensuing subgame involves direct hiring unless the NCA is valid, with the outcome as described in Lemma 1. With the remaining probability $1-\delta$, the employee is retained by firm s at a wage of $w^o - b$. If bargaining over the acquisition price succeeds, this generates a joint payoff for the two firms of $v_a - w^o$.

Consider the outside payoffs in acquisition bargaining t_a and t_s. Suppose first that $v_a > v_s + b$. Firm a wins in wage-bidding. Hence, the firm hires the employee at a competitive wage if it can engage in direct hiring (δ) and the NCA is not enforced ($1-p$). Firm s loses in wage-bidding, but may be a monopsonist over the employee. Hence, the firm hires the employee at a monopsonistic wage unless firm a can engage in direct hiring and the NCA is not enforced.

Suppose second that $v_a < v_s + b$. Firm a loses in wage-bidding. Hence, the firm never hires the employee. Firm s wins in wage-bidding and may be a monopsonist over the employee. Hence, the firm hires the employee at a competitive wage if firm a can engage in direct hiring and the NCA is not enforced and at a monopsonistic wage otherwise.

Nash bargaining implies the acquisition occurs whenever the surplus $v_a - w^o - [t_a + t_s]$ is positive and determines how this surplus is split. I obtain the following result.

Lemma 2. *Suppose firm a chooses acquihiring. Then, in the continuation equilibrium:*

- *Suppose that $v_a > v_s + b$. The acquisition takes place, and the employee is hired by firm a at a wage of w^o.*

[14] Throughout I focus on equilibria in undominated strategies in which a firm does not bid more than its willingness to pay.

- *Suppose that $v_a < v_s + b$. If $v_s + \delta(1-p)w^o + b > [1 + (1-p)\delta]v_a$, no acquisition takes place. Otherwise, the acquisition takes place, and the employee is hired by firm a at a wage of w^o.*

Now consider firm a's choice between acquihiring and direct hiring. When p is high, that is, the NCA is likely to be enforced, firm a prefers acquihiring over direct hiring because the firm will fail to directly hire the employee with high probability.

When p is not too high, direct hiring may yield a higher expected payoff for firm a than acquihiring. In this case, whether firm a chooses direct hiring over acquihiring depends on v_a. To see this, consider how the value of v_a affects the profitability from each hiring strategy. If the NCA is not enforced, and firm a hires the employee through direct hiring, the firm pays a competitive wage, independent of v_a, to the employee. Hence, every unit increase in v_a results in an equivalent gain for firm a. Instead, if firm a hires the employee through acquihiring, the firm pays a portion of v_a to firm s in the process of acquisition bargaining and thus the gain from the increase in v_a is reduced. Therefore, when v_a is sufficiently high, firm a prefers direct hiring over acquihiring to save the payment to obtain the employee.

When the value of v_a is not high, firm a prefers acquihiring to direct hiring. Hence, in such a case, firm a chooses acquihiring whenever possible. As I discussed in the paragraph before Lemma 2, acquihiring is possible when it increases the joint payoff for the two firms. The higher the value v_a, the larger the joint payoff, which makes it easier to reach an agreement in acquisition bargaining. When v_a is low, acquihiring is not feasible, in which case firm a chooses direct hiring from the tie-breaking assumption. Put together, firm a chooses acquihiring when v_a takes an intermediate value.

Before summarizing the above discussion, I briefly discuss which hiring strategy the employee prefers. If firm a chooses direct hiring, wage-bidding may occur, whereas if the firm chooses acquihiring, the employee always faces a monopsonistic wage. For this reason, the employee always prefers direct hiring.

Comparing firm a's payoffs across each option yields the following result.

Proposition 1. *Firm a's hiring strategy depends on the value generated by the employee at the firm v_a. Let $\tilde{p}$ be the value of p such that $(1-\alpha)(1-\delta)(1-p) - \alpha p = 0$.*

- *Suppose that the enforcement probability p is sufficiently low such that $0 \leq p < \tilde{p}$. Firm a hires the employee through direct hiring if $v_a > \bar{v}_a$, where*

$$\bar{v}_a(p) \equiv \ v_s + b + \frac{\alpha\delta(1-p)(v_s - w^o + b)}{(1-\alpha)(1-\delta)(1-p) - \alpha p} (> v_s + b),$$

and through acquihiring if $\underline{v}_a < v_a < \bar{v}_a$, where

$$\underline{v}_a(p) \equiv \frac{v_s + \delta(1-p)w^o + b}{1 + \delta(1-p)} (< v_s + b).$$

No hiring occurs if $v_a < \underline{v}_a$. The employee always prefers direct hiring over acquihiring.

- *Suppose that the enforcement probability p is sufficiently high such that $\tilde{p} \leq p \leq 1$. Firm a hires the employee through acquihiring if $v_a > \underline{v}_a$. No hiring occurs if $v_a < \underline{v}_a$. The employee always prefers direct hiring over acquihiring.*

I provide a short discussion of the welfare property of equilibrium. The equilibrium worker allocation can be socially inefficient for two reasons. First, firm s and firm a do not internalize the employee's loss caused by the restriction of labor market competition in acquisition bargaining, leading to a negative externality for the employee. Hence, socially undesirable acquihiring may occur. Second, firm s does not internalize firm a's and the employee's losses caused by the NCA in determining whether firm s offers it, leading to negative externalities for firm a and the employee. Hence, socially undesirable employee retention may occur.

Effects of NCAs Now I discuss the effects of NCAs on the equilibrium hiring strategy, social welfare and worker welfare. I first show that under complete enforceability, the NCA always hurts the employee by eliminating wage competition, whereas it may improve social welfare by preventing inefficient acquihiring. Then, I show that under intermediate enforceability, the NCA may rather improve worker welfare by making acquihiring impossible while keeping wage competition partially viable, which I elaborate on below.

As a benchmark, consider the case where $p = 0$. The results in this case are essentially the same as those presented in Bar-Isaac et al. (2024). When $p = 0$, the NCA has no effect on labor market competition, and firm a may profitably choose direct hiring, in which case, wage competition leads to the efficient worker allocation. Hence, acquihiring can only distort the worker allocation or leave it unchanged. Therefore, the worker allocation is efficient when firm a chooses direct hiring but may be inefficient when the firm chooses acquihiring. Regarding worker welfare, the employee receives a competitive wage when firm a chooses direct hiring but a monopsonistic wage when firm a chooses acquihiring.

Next, consider an opposite extreme case where $p = 1$. Firm a can never hire the employee through direct hiring due to the NCA with full enforceability. Hence, without acquihiring, firm s has monopsony power over the employee. Acquihiring transfers the monopsony power from firm s to firm a. Therefore, acquihiring takes place if and only if it is efficient, that is, $v_a > v_s + b$. Consequently, complete acceptance of NCAs leads to the efficient worker allocation achieved through efficient acquihiring. The employee, by contrast, always receives a monopsonistic wage due to the complete lack of wage competition.

A shift from no enforcement of NCAs to the full enforcement introduces a tension between social welfare and worker welfare. As shown above, such a shift may improve social welfare but may decrease worker welfare.

In the following, I examine the partial relaxation of restrictions on NCAs and highlight that an increase in their enforceability — short of full enforcement — may improve worker welfare. The following proposition illustrates the effects of the relaxation in industries with high acquisition potential.

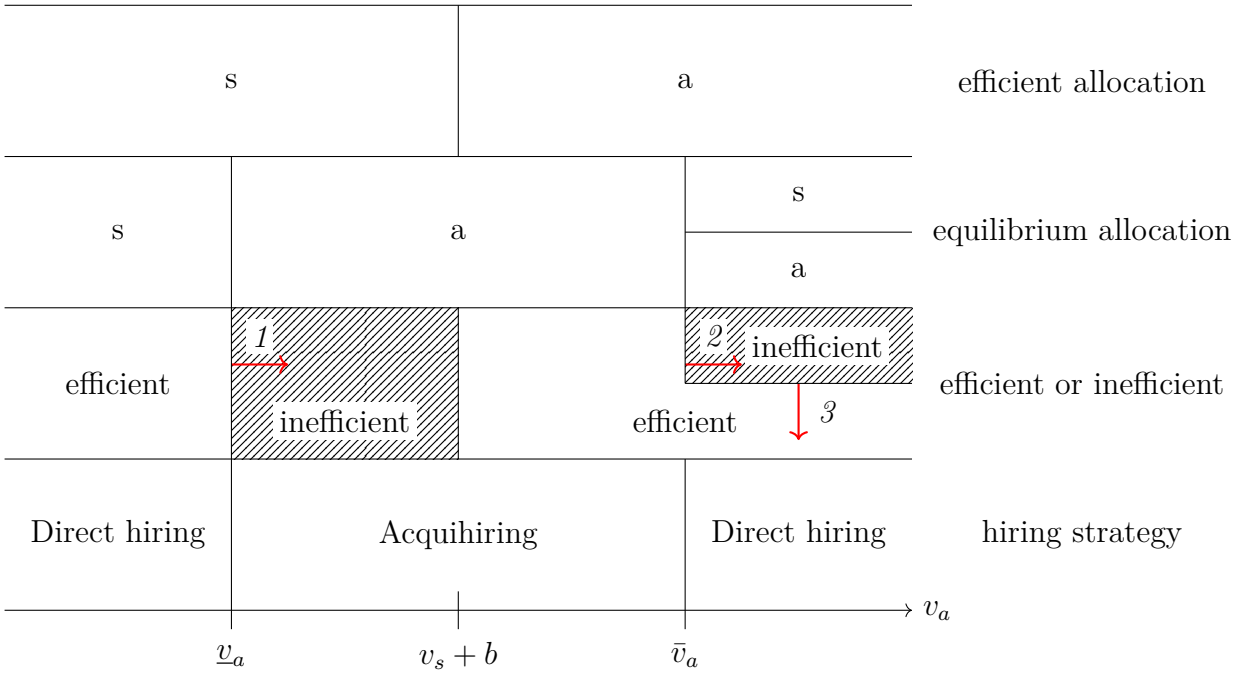

Figure 1: $0 < p < \tilde{p}$

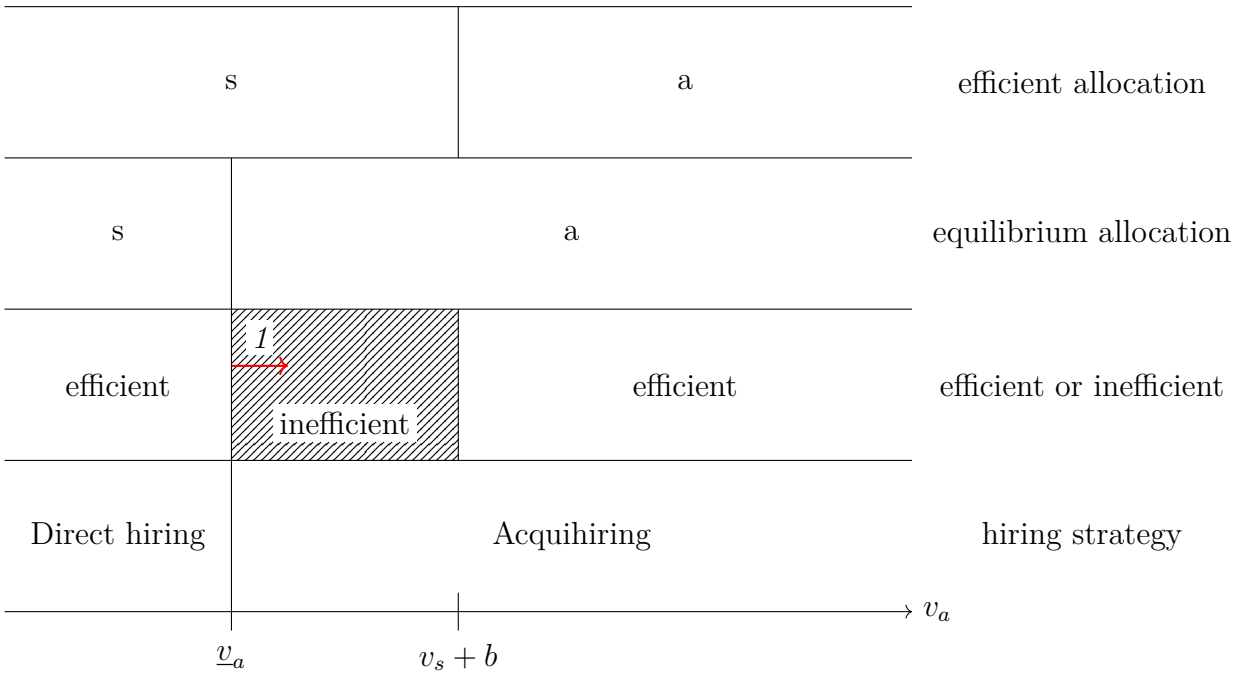

Figure 2: $\tilde{p} \leq p < 1$

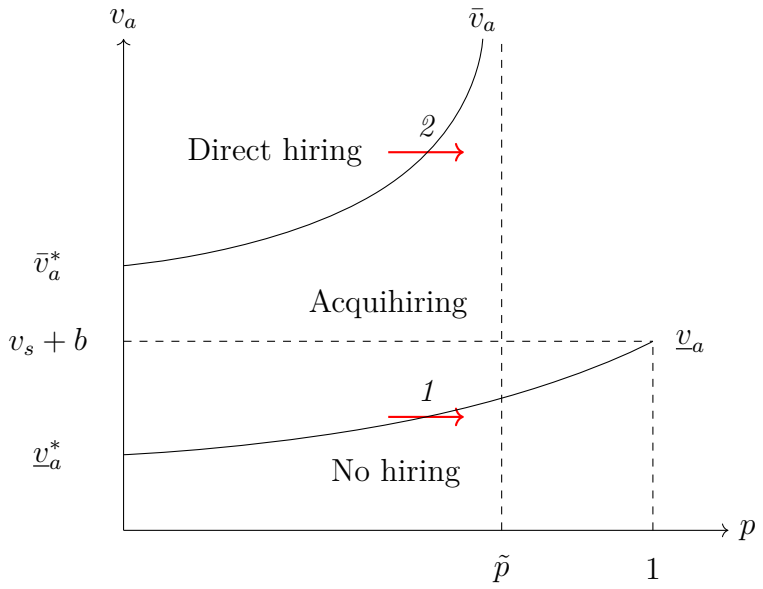

Figure 3: Relaxation of restrictions on NCAs

Proposition 2. *The relaxation of restrictions on NCAs (an increase in p) may:*

1. *eliminate inefficient acquihiring, that is, $\frac{\partial \underline{v}_a}{\partial p} > 0$ for all $p \in (0, 1)$, and*
2. *induce efficient acquihiring, that is, $\frac{\partial \bar{v}_a}{\partial p} > 0$ for all $p \in (0, \tilde{p})$, where $\tilde{p}$ is defined in Proposition 1.*

To understand the intuition behind Proposition 2 and its implications for worker allocation and worker welfare, I consider how the enforceability of NCAs affects the realization of acquihiring using Figure 1-Figure 3. Figure 1 summarizes the equilibrium worker allocation, its efficiency and the equilibrium hiring strategy in the case where $0 < p < \tilde{p}$. Figure 2 presents the corresponding summary for the case where $\tilde{p} \leq p < 1$. Figure 3 consolidates the equilibrium hiring strategies from both cases into a single figure. The red arrows in these figures indicate the effects of the increase in the enforceability.

I discuss the two cases where the equilibrium worker allocation is inefficient to show how NCAs can improve worker allocation and worker welfare by affecting the realization of acquihiring. These two cases correspond to the shaded areas in Figure 1. First, consider the case where $\underline{v}_a < v_a < v_s + b$, which is represented by the shaded area on the left side of Figure 1. In this case, the equilibrium worker allocation is inefficient, because the employee works for firm a as a consequence of acquihiring, even though working for firm s is socially efficient. The increase in the enforceability of NCAs raises the probability that firm s will become a monopsonist over the employee, which enhances firm s's outside payoff in acquisition bargaining. Hence, it makes acquihiring harder and thus may prevent socially inefficient acquihiring caused by the negative externality in acquisition bargaining (Effect *1* of Figure 1-Figure 3). In this way, higher enforceability of NCAs may improve worker allocation. Furthermore, preventing acquihiring promotes labor market competition and, consequently, enhances worker welfare.

Second, consider the case where $v_a > \bar{v}_a$ and the NCA is enforced, which is represented by the shaded area on the right side of Figure 1. In this case, the equilibrium worker allocation is inefficient, because the employee remains with firm s due to the NCA, even though working for firm a is socially efficient. The increase in the enforceability of NCAs raises the probability that firm a will fail to hire directly, which makes acquihiring a more attractive strategy. This may induce acquihiring and thus prevent socially inefficient employee retention that arises from the NCA (Effect *2* of Figure 1 and Figure 3). In this way, a stricter enforcement of NCAs may improve worker allocation. However, inducing acquihiring impedes labor market competition and thus reduces worker welfare.

As a direct effect, when firm a still chooses direct hiring even after the increase in the enforceability of NCAs, the higher enforceability reduces the likelihood of direct hiring as a consequence of the NCA itself (Effect *3* of Figure 1), thereby distorting the worker allocation if $v_a > \bar{v}_a$ and decreasing worker welfare if $v_a < \underline{v}_a$ or $v_a > \bar{v}_a$.

In the case where $v_s + b < v_a < \bar{v}_a$, the enforceability of NCAs has no effect on the worker allocation or worker welfare, though it affects firms' outside payoffs in acquisition bargaining and, consequently, the acquisition price.

Finally, I summarize the effects of NCAs on startups' profitability. It is easily verified from equations (1) and (3) in the proof of Lemma 2 in the Appendix that the acquisition price increases with the enforceability. This implies that NCAs may not only enable startups to earn monopsony profits but also increase acquisition prices. In existing studies, NCAs are noted as providing startups with several benefits, including the suppression of wages (US-Treasury, 2016), secure returns on investments (Klein, 1998; US-Treasury, 2016), and protection of intellectual property (Coyle and Polsky, 2013; Marx et al., 2009). For startups facing the threat of acquihiring, NCAs serve an additional function: they act as a potential countermeasure to acquihiring. By granting startups monopsony power over their employees, NCAs increase their outside payoffs in acquisition bargaining. Consequently, it becomes more challenging for potential acquirers to take over startups. In addition, even if NCAs do not prevent acquihiring, they drive up acquisition prices and thus benefit startups.

3.2 Optimal NCA regulation

Using the comparative statics results, I examine a worker-welfare-maximizing competition authority. From now on, suppose that the competition authority can adjust the enforcement level p and chooses it to maximize worker welfare. Let $\underline{v}_a^*$ be the value of $\underline{v}_a$ when $p = 0$ and $\bar{v}_a^*$ be the value of $\bar{v}_a$ when $p = 0$. The following proposition characterizes the worker-welfare-maximizing policy.

Proposition 3. *A worker-welfare-maximizing competition authority adopts a partial allowance of NCAs when v_a is within a moderate range, specifically $\underline{v}_a^* < v_a < v_s + b$, where*

$$\underline{v}_a^* \equiv \frac{v_s + \delta w^o + b}{1 + \delta}.$$

Then, it chooses the lowest enforcement level possible that can still prevent acquihiring, p^* such that $v_a = \underline{v}_a(p^*)$.

In the following, I discuss how the optimal regulation of NCAs depends on firm a's competitive advantage v_a. First, consider two cases where the optimal regulation is a complete ban. If $v_a > \bar{v}_a^* \left(= v_s + b + \frac{\alpha\delta(v_s - w^o + b)}{(1-\alpha)(1-\delta)}\right)$, firm a can hire the employee through either direct hiring or acquihiring, and chooses direct hiring because the firm is required to pay a substantial amount to firm s in the process of acquisition bargaining. In addition, the increase in the enforceability of NCAs may instead trigger acquihiring as shown in the second part of Proposition 2. Hence, the competition authority imposes a complete ban on NCAs. Similarly, if $v_a < \underline{v}_a^*$, acquihiring does not succeed even when $p = 0$ since v_a is very low. $p = 0$ is the most favorable condition for a successful acquisition among all enforcement levels because firm s's outside payoff in acquisition bargaining is minimized at $p = 0$, which is easily verified from equation (2) in the proof of Lemma 2 in the Appendix. Hence, the competition authority does not need to increase the enforceability of NCAs to hinder the success of acquihiring and thus entirely bans NCAs.

Next, consider the case where NCA regulation has no effect on worker welfare because acquihiring takes place regardless of the enforceability of NCAs. If $v_s + b < v_a < \bar{v}_a^*$, acquihiring always occurs; the competition authority cannot incentivize direct hiring for firm a by decreasing p, nor can it hinder the success of acquihiring by increasing p. This observation highlights that, if the competition authority were to regulate acquihiring, such regulation would be most effective in this case.

Finally, consider the case where a partial allowance of NCAs constitutes the optimal regulation. If $\underline{v}_a^* < v_a < v_s + b$, the increase in the enforceability of NCAs improves firm s's outside payoff in acquisition bargaining and thereby makes acquihiring harder. Hence, the allowance of NCAs may enhance worker welfare by preventing acquihiring. However, at the same time, a stricter enforcement of NCAs may lead to restricted job mobility and, consequently, reduce worker welfare. Therefore, the competition authority chooses the lowest enforcement level possible that can still prevent acquihiring.

3.3 Other comparative statics

Building on the preceding discussion, how do changes in market environments affect the effectiveness of NCA regulation and the optimal regulation level? First, I examine firm a's bargaining power in acquisition bargaining, α. $\bar{v}_a$ increases with α, and $\underline{v}_a$ is independent of α. If firm a's bargaining power increases, the firm's profitability from acquihiring improves, making acquihiring a more attractive hiring strategy. As a result, acquihiring is more likely to take place and the competition authority cannot address it merely by adjusting the enforcement level of NCAs.

Next, I consider the probability that firm a engages in direct hiring after the failure of acquihiring, δ. As mentioned earlier, this probability can be thought of as reflecting delay and discounting. For instance, in industries characterized by intense technological competition, firms that seek to hire talented engineers from competitors would face significant

losses due to delays in acquiring talent. In such cases, δ is likely to be small. $\bar{v}_a$ increases with δ, and $\underline{v}_a$ decreases with δ. As the probability decreases, firm a's outside payoff in acquisition bargaining declines, while firm s's outside payoff increases, making acquihiring a less attractive hiring strategy. Consequently, the likelihood that the competition authority can deter acquihiring by adjusting the enforcement level of NCAs increases. In addition, the decrease in that probability makes it more difficult for acquisition bargaining to reach an agreement, which enables the deterrence of acquihiring at a lower enforcement level. Hence, the competition authority chooses a lower level.

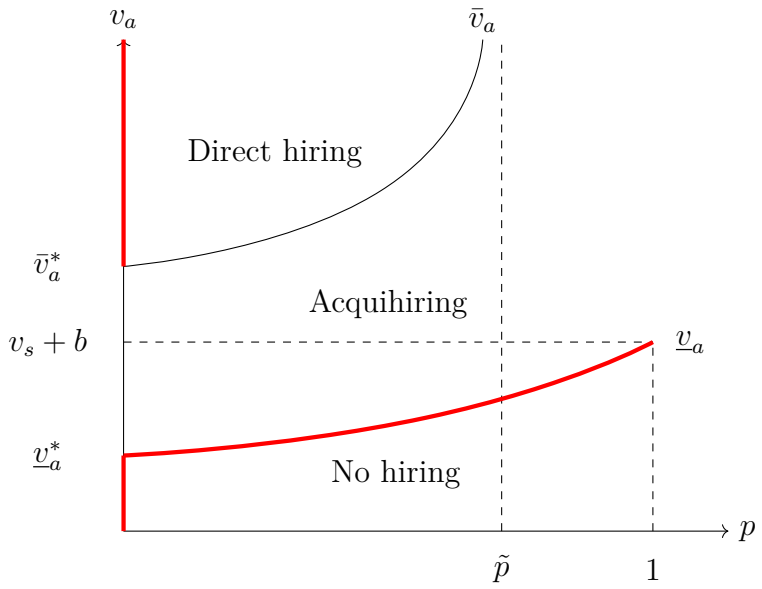

Figure 4: Worker-welfare-maximizing policy

4 Policy implications

Based on my analysis, I discuss the policy implications. The relaxation of restrictions on NCAs hampers job mobility, leading to inefficient employee retention. However, at the same time, the relaxation may improve worker allocation and thus social welfare, through two channels. First, by strengthening startups' position in acquisition bargaining, such relaxation can prevent inefficient acquihiring caused by the negative externality arising in the bargaining. Second, the relaxation reduces the success rate of direct hiring, inducing acquihiring, which thereby prevents inefficient employee retention resulting from NCAs. Because of these two effects, NCA regulation could distort worker allocation, which should be recognized by competition authorities when considering the regulation in labor markets with high acquisition potential.

The relaxation of restrictions on NCAs impedes labor market competition for employed workers, leading to their lower wages and thus worker welfare. In addition, by making direct hiring less attractive to potential acquirers, such relaxation can induce acquihiring, which restricts labor market competition and thus reduces worker welfare. However, at

the same time, the relaxation may prevent acquihiring, promote labor market competition (though imperfectly), and improve worker welfare. In other words, NCA regulation aimed at protecting workers' right to change jobs may induce acquihiring, which could be viewed as a waterbed effect, and ultimately harm workers — a consequence that competition authorities should also recognize when considering the regulation in labor markets with high acquisition potential.

Partial NCAs imposed by startups on their employees could potentially create a win-win outcome for both even if the employees have no bargaining power in negotiations on NCAs. Startups benefit from NCAs because the agreements restrict competition for their employees, which enables the firms to set lower wages. At the same time, the employees benefit from NCAs because the agreements may prevent acquihiring, which protects labor market competition (though imperfectly).

Finally, I discuss the relationship between NCA regulation and merger regulation. In labor markets with the possibility of acquihiring, NCA regulation may grant anticompetitive leverage to Big Tech firms. They reduce startups' profitability, making it easier for Big Tech firms to acquire them, which could ultimately lead to an increase in their market power. Therefore, the validity of NCA regulation in industries with high acquisition potential depends on whether proper merger policies are in place. Traditional merger regulation typically focuses on cases where changes in product market concentration resulting from mergers are significantly large, and thus acquisitions of startups, which tend to have very small market shares, have rarely been challenged. If competition authorities were able to effectively regulate acquihiring, the positive effects of NCAs on worker allocation and worker welfare explored in this article would not arise. Instead if resource constraints or other factors prevent the proper regulation of acquihiring, which primarily involves startup acquisitions, NCA regulation in such industries should be carefully reconsidered.

In many countries, NCA regulation and merger regulation are carried out independently by different authorities governing distinct legal areas — competition law and labor law — resulting in coordination issues between the two regulatory frameworks. In this regard, the FTC's recent proactive engagement with labor markets may contribute to addressing issues arising from the dichotomy between competition law and labor law, even though the final rule itself remains controversial. At the very least, such an approach by the FTC is desirable in that it increases the likelihood of appropriate regulation of NCAs in labor markets with the possibility of acquihiring.

5 Conclusion

This article has explored a model of labor market competition with the possibility of acquihiring. NCAs enable startups to gain favorable positions in acquisition bargaining by granting them monopsony power over their employees, thereby serving as a potential countermeasure to acquihiring. This role has been unexplored in existing research. Moreover, I have considered how the enforceability of NCAs affects the realization of acquihiring. If a competition authority relaxes restrictions on NCAs, it becomes harder for

potential acquirers to close acquisition bargaining because the relaxation increases startups' outside payoffs in the bargaining. This policy change may eliminate acquihiring, thereby improving worker allocation. In addition, preventing acquihiring promotes labor market competition and thus improves worker welfare. On the other hand, the policy change may induce acquihiring by making direct hiring less attractive to potential acquirers, which could also improve worker allocation. Because of these positive effects, NCA regulation may distort worker allocation and/or actually harm workers, while intended to protect them.

Due to growing concerns about labor market concentration in recent years, several regulatory changes regarding NCAs have been implemented. Moreover, following the FTC's issuance of its final rule, further regulatory changes are expected. As a result, opportunities for natural experiments have been increasing, which enhances the empirical testability of the implications presented in this article. When conducting empirical analysis, one of the major challenges is the difficulty of observing the difference between v_a and $v_s + b$. The acquisition price likely reflects this difference and may thus serve as a proxy, though various other factors must be taken into account.

Appendix

This appendix contains the proofs omitted in the text.

Proof of Lemma 2. Suppose first that $v_a > v_s + b$. From the above discussion, I have

$$\begin{aligned} t_a &= \delta \times [p \times 0 + (1-p) \times \{v_a - (v_s + b)\}] + (1-\delta) \times 0 \\ &= (1-p) \times \delta \times [v_a - (v_s + b)] \end{aligned}$$

and

$$\begin{aligned} t_s &= \delta \times [p \times \{v_s - (w^o - b)\} + (1-p) \times 0] + (1-\delta) \times \{v_s - (w^o - b)\} \\ &= [p + (1-p)(1-\delta)][v_s - (w^o - b)]. \end{aligned}$$

Hence, $t_a + t_s = (1-p)\delta v_a + [1 - 2(1-p)\delta](v_s + b) - [1 - (1-p)\delta]w^o$, which is strictly less than $v_a - w^o$, implying that there is an agreement on an acquisition price. The acquisition price P_a (which is also firm s's payoff) is given by

$$\begin{aligned} P_a &= t_s + (1-\alpha) \times [v_a - w^o - (t_a + t_s)] \\ &= (1-\alpha)[1 - \delta(1-p)]v_a + [(1-p)(1-2\alpha)\delta + \alpha](v_s + b) - [1 - \alpha\delta(1-p)]w^o. \quad (1) \end{aligned}$$

Firm a's payoff in this case π_a^A is given by $v_a - w^o - P_a$, which can be written as

$$\begin{aligned} \pi_a^A &= v_a - w^o - P_a \\ &= [(1-p)(1-\alpha)\delta + \alpha]v_a - [(1-p)(1-2\alpha)\delta + \alpha](v_s + b) - \alpha\delta(1-p)w^o. \end{aligned}$$

Suppose second that $v_a < v_s + b$. From the above discussion, I have

$$\begin{aligned} t_a &= \delta \times [p \times 0 + (1-p) \times 0] + (1-\delta) \times 0 \\ &= 0 \end{aligned}$$

and

$$\begin{aligned} t_s &= \delta \times [p \times \{v_s - (w^o - b)\} + (1-p) \times \{v_s - (v_a - b)\}] + (1-\delta) \times \{v_s - (w^o - b)\} \\ &= -(1-p)\delta v_a + v_s + b - [p + (1-p)(1-\delta)]w^o. \end{aligned} \tag{2}$$

Hence, $t_a + t_s = -(1-p)\delta v_a + v_s + b - [p + (1-p)(1-\delta)]w^o$, implying that the acquisition takes place when $[1 + (1-p)\delta]v_a > v_s + (1-p)\delta w^o + b$. If it does, the acquisition price P_a is given by

$$\begin{aligned} P_a &= t_s + (1-\alpha) \times [v_a - w^o - (t_a + t_s)] \\ &= [1 - \alpha\{1 + (1-p)\delta\}]v_a + \alpha(v_s + b) - [1 - \alpha\delta(1-p)]w^o. \end{aligned} \tag{3}$$

Again, firm a's payoff in this case π_a^A is given by $v_a - w^o - P_a$, which can be written as

$$\begin{aligned} \pi_a^A &= v_a - w^o - P_a \\ &= \alpha[\{1 + (1-p)\delta\}v_a - (v_s + b) - \delta(1-p)w^o]. \end{aligned}$$

□

Proof of Proposition 1. Suppose first that $v_a > v_s + b$. Then,

$$\pi_a^D - \pi_a^A = [(1-\alpha)(1-\delta)(1-p) - \alpha p][v_a - (v_s + b)] - \alpha\delta(1-p)(v_s - w^o + b)$$

When $(1-\alpha)(1-\delta)(1-p) - \alpha p < 0$, $\pi_a^D < \pi_a^A$ always holds. In contrast, when $(1-\alpha)(1-\delta)(1-p) - \alpha p > 0$, $\pi_a^D > \pi_a^A$ holds if $v_a > v_s + b + \frac{\alpha\delta(1-p)(v_s - w^o + b)}{(1-\alpha)(1-\delta)(1-p) - \alpha p} (= \bar{v}_a)$.

Suppose second that $v_a < v_s + b$. Then, $\pi_a^D = 0$ because firm a never hires the employee through direct hiring. In contrast, following Lemma 2, firm a would profitably acquihire when $v_a > \frac{v_s + \delta(1-p)w^o + b}{1 + \delta(1-p)} (= \underline{v}_a)$.

Finally, I consider which hiring strategy the employee prefers. The employee's payoff is certainly w^o if firm a chooses acquihiring, whereas the employee has a chance to get a higher payoff than w^o if firm a chooses direct hiring. Hence, the employee always prefers direct hiring over acquihiring. □

References

Balasubramanian, Natarajan, Jin Woo Chang, Mariko Sakakibara, Jagadeesh Sivadasan, and Evan Starr, "Locked in? The enforceability of covenants not to

compete and the careers of high-tech workers," *Journal of Human Resources*, 2022, *57* (S), S349–S396.

Bar-Isaac, Heski, Justin P Johnson, and Volker Nocke, "Acquihiring for Monopsony Power," *Management Science*, 2024.

Barnett, Jonathan, "'Killer Acquisitions' Reexamined: Economic Hyperbole in the Age of Populist Antitrust," *University of Chicago Business Law Review (Forthcoming), USC CLASS Research Paper*, 2023, (23-1).

Battiston, Diego, Miguel Espinosa, and Shuo Liu, "Talent poaching and job rotation," *Management Science*, 2024.

Benkert, Jean-Michel, Igor Letina, and Shuo Liu, "Startup acquisitions: Acquihires and talent hoarding," *arXiv preprint arXiv:2308.10046*, 2023.

Boyacıoğlu, Beril, Mahmut N Özdemir, and Samina Karim, "Acqui-hires: Redeployment and retention of human capital post-acquisition," *Strategic Management Journal*, 2024, *45* (2), 205–237.

Cabral, Luís, "Merger policy in digital industries," *Information Economics and Policy*, 2021, *54*, 100866.

_ , *Big Tech Acquisitions*, Centre for Economic Policy Research, 2023.

Chatterji, Aaron and Arun Patro, "Dynamic capabilities and managing human capital," *Academy of Management Perspectives*, 2014, *28* (4), 395–408.

Chen, Deqiu, Huasheng Gao, and Yujing Ma, "Human capital-driven acquisition: evidence from the inevitable disclosure doctrine," *Management Science*, 2021, *67* (8), 4643–4664.

Chen, Jun, Shenje Hshieh, and Feng Zhang, "Hiring high-skilled labor through mergers and acquisitions," *Journal of Financial and Quantitative Analysis*, 2024, *59* (6), 2762–2798.

Coyle, John F and Gregg D Polsky, "Acqui-hiring," *Duke Law Journal*, 2013, *63* (2), 281–346.

Fumagalli, Chiara, Massimo Motta, and Emanuele Tarantino, "Shelving or developing? Optimal policy for mergers with potential competitors," *SSRN Working Paper*, 2022.

Jeffers, Jessica S, "The impact of restricting labor mobility on corporate investment and entrepreneurship," *The Review of Financial Studies*, 2024, *37* (1), 1–44.

Johnson, Matthew S, Michael Lipsitz, and Alison Pei, "Innovation and the enforceability of noncompete agreements," Technical Report, National Bureau of Economic Research 2023.

Katz, Michael L, "Big Tech mergers: Innovation, competition for the market, and the acquisition of emerging competitors," *Information Economics and Policy*, 2021, *54*, 100883.

Klein, Benjamin, "The hold-up problem," *THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW, Peter Newman, ed., Macmillan Reference Limited*, 1998.

Kräkel, Matthias and Dirk Sliwka, "Should you allow your employee to become your competitor? on noncompete agreements in employment contracts," *International Economic Review*, 2009, *50* (1), 117–141.

Letina, Igor, Armin Schmutzler, and Regina Seibel, "Killer acquisitions and beyond: policy effects on innovation strategies," *International Economic Review*, 2024, *65* (2), 591–622.

Marx, Matt, Deborah Strumsky, and Lee Fleming, "Mobility, skills, and the Michigan non-compete experiment," *Management science*, 2009, *55* (6), 875–889.

Motta, Massimo and Martin Peitz, "Big tech mergers," *Information Economics and Policy*, 2021, *54*, 100868.

Mukherjee, Arijit and Luis Vasconcelos, "Star wars: Exclusive talent and collusive outcomes in labor markets," *The Journal of Law, Economics, & Organization*, 2012, *28* (4), 754–782.

Posner, Eric A, George G Triantis, and Alexander J Triantis, "Investing in human capital: The efficiency of covenants not to compete," *U Chicago Law & Economics, Olin Working Paper*, 2004, (137), 01–08.

Shy, Oz and Rune Stenbacka, "Noncompete agreements, training, and wage competition," *Journal of Economics & Management Strategy*, 2023, *32* (2), 328–347.

Starr, Evan, "Consider this: Training, wages, and the enforceability of covenants not to compete," *ILR Review*, 2019, *72* (4), 783–817.

_ , Natarajan Balasubramanian, and Mariko Sakakibara, "Screening spinouts? How noncompete enforceability affects the creation, growth, and survival of new firms," *Management Science*, 2018, *64* (2), 552–572.

US-Treasury, "Non-compete contracts: Economic effects and policy implications," 2016.