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Local labor market concentration and union activity in the Philippines: descriptive estimates and implications

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Workers' voice institutions traditionally counterbalance the persistent wage- and term-setting power of firms in labor markets, but can only do so if they *exist*. Do we observe less union activity in labor markets where employment is more concentrated? We address this question and estimate unionization and bargaining activity across broadly aggregated industry-region labor markets using two register data sources from the Philippines: an establishment-level census and a union and collective bargaining registration database. Our results suggest that local labor market concentration is robustly and negatively associated with new union registrations and new collective agreements. A one-standard-deviation increase in the employment Herfindahl-Hirschman Index (HHI) and the four-firm concentration ratio (CR4) is associated with a 12 percentage-point (pp) and 10.4 pp lower probability of having a new union registration, and a 9.7 pp and 15.3 pp lower probability of having a new collective agreement, on average, respectively. Further, concentration is also associated with lower union membership densities. These results highlight how employer power in input labor markets is plausibly prohibitive for collective action and may deter organizing and bargaining in contexts where only a handful of firms dominate employment. For antitrust authorities in developing country contexts with low union salience and decentralized bargaining systems, a closer examination of the repercussions of concentrated labor markets in merger reviews, competition enforcement, and policy research is a promising way forward.

JEL classification: J42, J51, J52

Keywords: local labor markets, collective bargaining, union membership, competition

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1. Introduction

In recent years, labor market competition has become an increasingly salient priority for antitrust authorities and regulators globally. This reflects a growing recognition that anticompetitive practices in markets harm not only consumers in product markets but also workers in (input) labor markets. Competition authorities in the United States (US), United Kingdom, and Australia have launched investigations into employer collusion, wage-fixing agreements, and the misuse of non-compete clauses, which restrict worker mobility and suppress wages. Notably, the US Department of Justice secured its first criminal conviction under wage-fixing laws in *United States v. Eduardo Lopez* in April 2025, marking a milestone in the enforcement of competition laws on employer collusion [Rao et al. 2025]. In February 2024, the US Federal Trade Commission's (FTC) legal challenge of the proposed merger between Kroger and Albertsons incorporated the negative effects on workers' wages and benefits as part of its theories of harm, arguing that unions would have lower leverage to bargain with the merged entity [FTC 2024]. Meanwhile, the European Commission and various national regulators in Europe have begun embedding scrutiny of monopsony power into merger reviews. This signals a shift toward evaluating how proposed transactions might entrench employer power in labor markets [Aguado 2025]. These developments reflect antitrust authorities' growing recognition that the relevance of competition law extends beyond product markets and, importantly, encompasses input labor markets.

Beyond regulation, labor movements have long been a tool to counteract the downward pressure on wages and working conditions (e.g., through bargaining), but they can arguably only do so if they *exist*. On the one hand, standard rent-seeking models suggest unions, acting on their "monopoly face" [Freeman and Medoff 1984], target concentrated product markets where incumbent firms earn excess rents and deter investments [Grout 1984]. On the other hand, when input labor markets are concentrated, such that few employers compete for workers, organizing may become more challenging. Dominant employers can more easily surveil and retaliate against organizing attempts, while workers face limited outside options, undermining their bargaining leverage [Naidu et al. 2018].

The interplay between market concentration and union activity remains an active area of empirical research, especially in highly industrialized contexts. This article contributes to this literature by documenting robust negative associations between employment concentration and new union activity across local labor markets in the Philippines. As a middle-income economy with low union salience, highly decentralized bargaining, and a nascent competition authority, the Philippines possesses common institutional features found across developing countries. Crucially, the Philippine Competition Commission has yet to incorporate labor market analysis into its merger reviews or publicly

announce enforcement action against anticompetitive practices of firms that deter competition in labor markets, such as non-compete clauses and no-poaching agreements.

Our descriptive findings show that employment concentration is robustly and negatively associated with both the probability of new union registrations and new collective bargaining agreements, even after controlling for industry, region, and market size indicators. We emphasize that these associations do not establish causality. Several confounding factors may drive both low union activity and high concentration, including business-friendly regulatory environments, weak labor law enforcement, or industry-specific characteristics that simultaneously discourage organizing and promote consolidation. Reverse causation is also plausible, such that lower unionization may enable firms to retain more profits for reinvestment and expansion, potentially increasing market concentration over time. Our contribution is therefore primarily descriptive. Notably, even in the absence of definitive identification, the strong negative association between concentration and union activity highlights a potential reinforcing dynamic worthy of regulatory attention. Local labor markets where employment is concentrated appear to face challenges in developing countervailing worker voice institutions. This pattern suggests that competition authorities in contexts with weak labor protections, and where unions might otherwise serve as an important check on employer power, should, at minimum, incorporate labor market dynamics in both merger and enforcement analyses. Such data collection would enable regulators to identify markets where concentration may be most problematic and lay the groundwork for future research that can establish causal mechanisms and inform more targeted interventions.

2. Countervailing forces in labor markets: a review of theory and evidence

2.1. Labor market monopsony

In contrast to assumptions in competitive markets, where agents are wage-takers and firms compete for workers, earlier models of imperfect competition recognize that firms exert power to set wages below the competitive level [Robinson 1933]. Recent work has broadly defined and operationalized “monopsony” to describe labor market structures in which firms, either individually or collectively, possess some term-setting power (Bhaskar et al. [2002]; Berger et al. [2022]). This power is often measured empirically using employment concentration, defined as the number of employers in a given local labor market. Evidence from US labor markets suggests that employer concentration can suppress wages for both incumbents and new hires, with effects ranging from 1.8 percent to 2.5 percent decreases (Bassanini et al. [2023]; Schubert et al. [2025]). As a market

externality, studies find a wide range of negative effects on earnings, productivity, and employment security, especially in smaller labor markets (Marinescu et al. [2020]; Qiu and Sojourner [2023]).

Building on this framework, a growing empirical literature examines how the entry of large, dominant firms reshapes local labor markets. In theory, such an entry can generate an initial positive employment shock, followed by negative spillovers. Empirical studies of Walmart Supercenter entries across US localities document declines in wages [Wilmers 2018], increases in poverty [Lehner et al. 2024], and reductions in union activity [Choper et al. 2026]. These effects are understood to operate through multiple, connected mechanisms: large firms exert pressure on local suppliers to shift production into their established networks, a cost-cutting strategy that restructures employment along the supply chain [Lehner et al. 2024]. They crowd out smaller competing employers (Wiltshire et al. [2024]; Lehner et al. [2024]; Wiltshire [2025]) and, in doing so, weaken workers' capacity to organize and join labor unions [Choper et al. 2026]. Unsurprisingly, countries where labor market concentration is higher on average have been observed to have higher levels of wage inequality [Pignatti and Ananian 2026].

2.2. Labor power

Seminal work on labor market institutions conceptualizes unions as serving two primary functions. First, unions countervail firm power by organizing workers into a collective body capable of exerting pressure through the threat of strikes, otherwise known as the “monopoly face” of unions [Freeman and Medoff 1984]. This capacity can directly affect firm production and strengthen workers' ability to bargain over wages, employment security, and working conditions, thereby reducing monopsonistic outcomes (Grout [1984]; Kaufman [2012]). At the macro level, evidence suggests that union presence mitigates inequality, in part, by attenuating the disproportionate effects of labor market power on workers at the lower end of the wage distribution (Brady [2022]; Dube et al. [2025]).

However, the ability of unions to perform this countervailing role has weakened in recent decades. Labor market deregulation and the expansion of flexible employment arrangements, particularly in the growing service sector, have made organizing and collective bargaining more difficult across both tradable and non-tradable sectors (Katz [1993]; Ebbinghaus [2004]; Schnabel [2013]). At the same time, the decentralization of bargaining systems has increasingly confined union influence on firms, limiting their broader market-shaping capacity. These trends are compounded by globalization, which has increased the mobility of capital and intensified competitive pressures in both product and labor markets, further constraining union organizing efforts (Hyman and Gumbrell-McCormick [2017]; Schulze-Cleven [2017]).

The interaction between labor power and firm power is formalized in models in which increased market concentration raises firm profits while weakening workers'

bargaining power [Dodini et al. 2022]. Empirical evidence is consistent with this framework. For instance, Choper et al. [2026] show that in the United States, Walmart Supercenters are less likely to enter local labor markets with higher levels of unionization. This suggests that unions can deter the expansion of large, dominant firms by limiting their ability to extract rents. At the same time, this dynamic implies that firms with substantial market power have incentives to avoid or actively mitigate unionization [Kaufman 2012]. Importantly, these findings are contingent on pre-existing levels of union strength, which may limit their applicability in contexts where union density is lower or more fragmented, such as in the Philippine case.

2.3. Union activity in the Philippines

Labor markets in the Philippines broadly reflect trends observed across developing economies, characterized by labor market deregulation, the expansion of flexible employment arrangements, and a structural shift from industrial to service-based employment (Kuruville et al. [2002]; Kuruville and Li [2021]). Within this context, unions continue to engage with core worker concerns, particularly wages and employment security, as documented in studies of union and worker association experiences (Aganon et al. [2009]; Certeza and Serrano [2014]; Serrano [2018]). However, their overall reach remains limited. Empirical evidence indicates that only a small share of workers is unionized and covered by collective bargaining agreements (CBAs) [Bitonio 2012]. More recent data further show that only one in five newly registered unions between 2016 and 2021 successfully negotiated CBAs, with bargaining outcomes observed to be relatively faster in manufacturing than in other sectors [Ramos and Suguitan 2025].

These patterns are consistent with broader global declines in private sector unionization across both developed and developing countries (Schnabel [2013]; Farber et al. [2021]; Asa [2024]). In the Philippine case, declining union density and limited CBA coverage reflect both structural and institutional constraints. The long-term shift away from manufacturing, traditionally the stronghold of union activity, towards more fragmented and dynamic service sectors has weakened the base for collective organization (Martin and Brady [2007]; Serrano [2018]; Schnabel [2020]). At the same time, unlike many European contexts where unions retain influence through centralized or sectoral bargaining arrangements, industrial relations in the Philippines are highly decentralized, with union formation and bargaining largely confined to the firm or plant level (Kuruville et al. [2002]; Viajar [2009]; Bitonio [2012]; Asa [2024]).

Institutional features of the labor market further constrain unionization. Legal frameworks restrict formal union membership primarily to regular employees, effectively excluding workers in informal or contractual arrangements and limiting the potential for broader-based organizing (Viajar [2009]; Asa [2024]). While union federations exist, bargaining outcomes remain largely determined

at the firm level, contributing to uneven and often limited bargaining coverage. Moreover, the presence of registered unions does not necessarily translate into successful CBAs, reinforcing gaps between formal organization and effective labor representation (Bitonio [2012]; Ramos and Suguitan [2025]).

At the firm level, these constraints are compounded by employer incentives and worker perceptions. Firms have clear incentives to deter unionization to preserve profits, particularly in contexts characterized by imperfect competition (Kuruvilla et al. [2002]; Dodini et al. [2022]). Correspondingly, fear of management hostility is frequently cited by workers as a barrier to union participation in the Philippines (Aganon et al. [2009]; Certeza and Serrano [2014]). Limited bargaining success and low coverage may also discourage workers from organizing, creating a feedback loop that further weakens union presence. Taken together, union activity in the Philippines is shaped by the interplay among structural economic shifts, institutional design, and firm-level dynamics, all of which constrain the capacity to effectively counter market power.

2.4. Recent empirical evidence on concentration and union power

Recent empirical work has moved beyond treating firm power and worker power as separate forces, instead examining how they jointly shape labor market outcomes. In Lehner et al. [2024] and Choper et al. [2026], labor markets are conceptualized in terms of the dynamics between workers' voice institutions and employer power. Hence, high firm power may coexist with either high or low worker power, both with distinct implications for union activity. For instance, in highly concentrated labor markets, workers may intensify organizing efforts in response to limited outside options, potentially sustaining some bargaining capacity despite monopsonistic conditions. In such contexts, unions may attempt to capture economic rents generated by imperfect competition, consistent with the "monopoly face" of unions in standard theories (Grout [1984]; Kaufman [2012]), and shape contract outcomes accordingly [Marinescu et al. 2020].

However, emerging evidence suggests that the interaction between concentration and union power may ultimately reinforce, rather than offset, firm dominance. Choper et al. [2026] find that unionization declines by approximately five percentage points following the entry of large monopsonistic firms into previously unionized labor markets in the United States. While unions may initially deter firm entry to some extent, successful entry appears to weaken union presence over time, limiting their countervailing capacity. These findings align with a broader literature showing that monopsonistic firms influence not only wages and employment, but also inequality and unionization dynamics (Manning [2021]; Lehner et al. [2024]; Dube et al. [2025]).

These dynamics have increasingly drawn attention within competition policy. While traditionally focused on product markets, antitrust enforcement is now more explicitly considering labor market effects, particularly the ability of firms

to set wages below marginal productivity (CEA [2016]; Autor et al. [2019]). Scholars have argued for incorporating labor market harms into antitrust analysis, especially in cases of mergers or conduct that increase employer concentration (Hemphill and Rose [2018]; Rose [2019]). In parallel, evidence from developing and East Asian contexts highlights how market concentration, often shaped by regulatory barriers to entry, can hinder structural transformation and limit employment generation, with downstream effects on wages and productivity [Balisacan 2021].

Taken together, this literature suggests that employment concentration not only reduces workers' outside options but also shapes the conditions under which collective bargaining emerges and persists. In highly concentrated labor markets, workers may face a dual constraint of limited mobility across employers and weakened institutional capacity to organize. At the same time, the direction of this relationship is theoretically ambiguous since concentration may suppress unionization through employer dominance or induce organizing as a response to constrained alternatives. This paper builds on this incipient literature by examining how employment concentration is associated with union activity and bargaining outcomes in the Philippine context, where union density and collective bargaining coverage remain limited. By situating the analysis in a setting characterized by decentralized bargaining and low union salience, the paper assesses whether countervailing labor power is present under conditions of structural constraint.

3. Data and methods

We construct a novel analytical dataset by first aggregating two previously untapped administrative databases from the Philippines for studying employment concentration and union activity: an establishment-level census and a national union registration database. The first source is the 2018 Census of Philippine Business and Industry (CPBI), administered by the Philippine Statistics Authority (PSA), which is a comprehensive census of establishments conducted every six years. This dataset contains data on employment, payroll, and revenues for over 65,000 firms in the formal sector. We aggregate this data to generate our key independent variables, labor market concentration indices, Herfindahl-Hirschman Index (HHI) and the four-firm concentration ratio (CR4), at the regional and industry levels. The second source is the union registration database maintained by the Department of Labor and Employment (DOLE) – Bureau of Labor Relations (BLR). While the full historical database tracks labor organizations as far back as 1953, our analysis restricts the sample to new union registrations and collective bargaining agreements (CBAs) recorded between 2016 and 2021. This window temporally aligns the union formation outcomes with the market concentration conditions captured in the 2018 CPBI. This dataset captures union characteristics at the time of registration, most notably the number of union members and the

total number of firm employees, which allows us to calculate initial union density. To combine these sources, we aggregate “local labor markets” as industry-region cells. Both datasets consistently apply two national classification frameworks: the one-digit Philippine Standard Industrial Classification (PSIC) and the regional-level Philippine Standard Geographic Code (PSGC). Using these identifiers, we merged the CPBI-based concentration indicators with the DOLE union registration outcomes to form our primary analytical sample.

As is common with administrative data sources, the DOLE union registry contains some gaps. First, some union registrations lack information on either the number of union members or the total firm employees, resulting in inadmissible values for union density estimates. Further, a subset of registrations lacks valid PSIC sector classifications, which prevents those observations from being matched to the CPBI market data. Furthermore, it is important to note that the CPBI is an establishment census that inherently captures only the formal sector. Since the PSA typically utilizes a sampling threshold for micro-enterprises and fully enumerates only establishments with 20 or more employees, our derived market concentration indices, HHI and CR4, strictly reflect product and labor market power within the formal economy. However, because labor unions organize almost exclusively within formal, registered enterprises, this restriction closely aligns our independent variables with the realistic boundaries of the unionized labor market.

3.1. Measuring employment concentration

To analyze the association between concentration and union activity, we utilize two indicators of concentration: the Herfindahl-Hirschman Index (HHI) and the four-firm concentration ratio (CR4). Standard economic analysis suggests that in imperfectly competitive markets, firms possess price- or wage-setting power that distorts total surplus. The HHI is a standard metric in competition analysis that captures the degree of concentration within a defined market. It is calculated by summing up the squares of the market shares of all firms in each industry-region cell:

$$HHI = \sum_{i=1}^n S_i^2 \quad (1)$$

where S_i is the market share of the i^{th} firm, and n is the number of firms in the defined market. Following the 2023 Department of Justice (DOJ)–Federal Trade Commission (FTC) Merger Review Guidelines, markets with HHI values exceeding 0.18 (or 1,800 depending on the scale) are generally deemed “highly concentrated”. While antitrust policy has traditionally focused on product-market concentration (monopoly power), recent literature has highlighted the critical role of labor-market concentration (monopsony power) in suppressing wages and altering labor outcomes (Autor et al. [2019]; Balisacan [2021]; Azar et al. [2022]). The construction of HHI measures varies significantly across studies depending on the

mechanism under investigation. Prior work has utilized employment shares (Azar et al. [2020]; Benmelech et al. [2022]), vacancy postings [Azar et al. 2020; 2022], or payroll [Handwerker and Dey 2024]. Each approach carries distinct measurement assumptions and potential limitations. Employment-based HHIs assume that current employment levels proxy for firms' labor demand and competitive position but may be contaminated by supply-side factors if workers sort across firms based on unobserved preferences or constraints. Vacancy-based measures more directly capture labor demand but require comprehensive job posting data rarely available in developing country contexts. Recent work has also raised methodological concerns about the sensitivity of HHI-based inferences to market-definition choices and the potentially nonlinear relationship between concentration indices and the actual exercise of market power [Berry et al. 2019]. Given these measurement challenges and the absence of a universally preferred concentration metric, we calculate HHI across three distinct bases (employment, payroll costs, and product market revenues) and additionally report results using the four-firm concentration ratio (CR4).

CR4 provides the aggregated share of the four largest firms in a defined local market, expressed as a percentage. This ratio is useful to indicate the form or structure of labor market competition. Higher CR4s imply an oligopsonistic or monopsonistic structure. However, this measure cannot capture the heterogeneity between and among the top four firms. For instance, if one firm dominates an industry with 80 percent of the employment share, with other firms having small and insignificant shares, this implies a monopsonistic structure. Whereas if four firms dominate another industry with 20 percent employment share each, this implies more of an oligopsonistic structure. Both scenarios yield a CR4 of 80 percent, although their market structures are different. Nonetheless, the CR4 is a useful complementary measure of concentration that reveals the relative size of the biggest firms in each local labor market.

To capture the multidimensional nature of concentration among firms, we construct and analyze four distinct measures, each of which captures a mechanism by which a firm or group of firms might be associated with the probability of new union registration. First, **employment concentration** is calculated as the total number of employees at each firm, thereby measuring the concentration of the *actual stock* of workers within and across firms in the same market. Second, while employment figures capture the *stock* of workers, **payroll concentration** captures a firm's share of the local *wage costs*. A firm might employ a moderate share of the local workforce but account for a large share of the payroll if it employs highly skilled, highly paid workers or sets the wage standard for the region. Utilizing payroll HHI, as is the practice in prior work [Berger et al. 2022], allows us to test whether concentration in compensation structures is associated with union formation differently than employment HHI.

Finally, to distinguish labor market concentration from traditional product market concentration, we also obtain HHIs based on **firm revenues**. In highly concentrated *product markets*, few producers dominate the selling of goods or services. Including revenue concentration is vital to our empirical strategy because it allows us to identify whether firms' power in product markets, labor markets, or both is associated with unionization. As a supplementary empirical analysis, we obtain concentration measures of **subcontracted employment**. Firms may attempt to evade unionization and dilute worker bargaining power by utilizing non-regular, precarious work arrangements, such as agency-hired or subcontracted labor. Measuring concentration in this domain allows us to account for alternative labor sourcing strategies and observe how the dominance of subcontracting practices in a market affects the registration of formal labor unions.

3.2. Relevant market definition

Market definition is foundational to any empirical assessment of labor market concentration and its relationship with collective bargaining outcomes. Following standard antitrust principles, the relevant market comprises two dimensions: geographic scope and product market definition. In labor markets, the latter corresponds to the set of substitutable employment opportunities defined by occupational classifications, skill categories, or industries and sectors.

3.2.1 Geographic market definition

The relevant geographic market delineates the spatial boundaries within which workers and employers engage in meaningful competition, specifically the area within which workers search for alternative employment and firms compete to recruit labor. This follows the logic of the hypothetical monopsonist test, such that a properly defined geographic market is the smallest region in which a hypothetical monopsonist could profitably impose a small but significant and non-transitory decrease in wages (SSNDW) [Naidu, et al. 2018]. This test is the labor market analog to the small but significant and non-transitory increase in price (SSNIP) test, which is the widely utilized equivalent in product markets [Motta 2004]. The appropriate geographic scope varies systematically with worker mobility, occupation-specific search costs, and the degree to which skills are portable across locations [Broulik 2026]. For highly specialized technical positions, the relevant market may be national or international; for occupations requiring physical presence or involving location-specific human capital, markets may be as narrow as metropolitan areas or commuting zones. The use of commuting zones as the geographic unit of analysis has become standard in the labor market concentration literature precisely because they approximate economically meaningful labor market boundaries defined by revealed commuting patterns rather than arbitrary administrative jurisdictions [Azar et al. 2020; 2022]. Commuting zones capture a realistic scope within which workers are willing to search for and accept employment,

thereby providing a defensible approximation of the geographic market within which employers compete for workers.

3.2.2. Product market definition (occupational or industry markets)

The product market dimension identifies the set of jobs or occupations that are reasonably substitutable from the perspectives of both workers (supply-side substitution) and employers (demand-side substitution). Operationally, this requires delineating groups of workers whose skills, qualifications, and job characteristics render them close substitutes in production. In antitrust contexts, such as hospital merger analysis, product markets are typically defined at the level of specific professional occupations [Prager and Schmitt 2021]. For instance, registered nurses constitute one market, licensed physicians another, each with distinct skill requirements and limited cross-substitutability.

The empirical literature on labor market concentration has predominantly adopted occupation-based market definitions. Azar et al. [2020], Bassanini et al. [2023], Qiu and Sojourner [2023] calculate concentration metrics within detailed occupational categories, given the (testable) presumption that workers within the same occupation face similar employment alternatives and compete within a common labor pool. This approach aligns with the theoretical premise that monopsony power derives from employer concentration within narrowly defined skill markets. However, occupation-based definitions are not universally appropriate. When analyzing decentralized union activity and collective bargaining, which typically occur at the firm or industry level and cover workers across multiple occupational categories, industry-based definitions better capture the relevant scope of labor market competition and bargaining outcomes. This approach is consistent with recent work by Benmelech et al. [2022], Meiselbach et al. [2022], and Rinz [2022], who define labor markets by industry when firm-level employment dynamics are the object of study. Moreover, data constraints frequently necessitate industry-level analysis: many administrative datasets, including the CPBI used in this study, report only aggregate firm-level employment without occupational disaggregation.

3.2.3. Analytical sample and union activity

Taken together, we broadly define local labor markets at the PSIC (industry)-region level and calculate concentration measures using total employment, payroll costs, firm revenues, and subcontracted employment. While this represents a broader market definition than the commuting zone-occupation approach common in US-based studies, this choice is both empirically constrained and conceptually defensible. First, the Philippines lacks commuting zone data, and unionization records contain geographic identifiers only at the regional level. Second, and critically, this broader definition likely leads us to underestimate labor market concentration. The relationship between market definition and measured

concentration is well-established: narrower geographic and product market definitions yield higher concentration levels because they more precisely isolate local competitive conditions. Azar et al. [2020] demonstrate this empirically for the United States: defining markets at the state level (the broadest possible geography), only seven percent of markets are highly concentrated ($HHI > 2500$); this rises to 60 percent under commuting zone definitions and 78 percent under county-level definitions. The progression is monotonic: finer market delineation reveals greater concentration.

In sum, our sample first comprised 306 observations spanning 17 regions and 18 sectors, constructed by aggregating CBA provision data to the PSIC-region level and merging with corresponding concentration measures. Six local labor markets were excluded because they had no recorded firm-level or union-level data in either data source. For both outcomes, namely union registration and collective bargaining, we code them as binary if there was at least one activity within the local labor market from 2016 to 2021. For a continuous outcome such as union density, these are averaged across all unions registered in each local labor market. Note, however, that many union registration entries have incomplete information regarding the number of unionized workers and the number of employees in the firm upon registration, leading to a substantial data loss for the union density variable. Notably, our sample should be understood to capture firm and union activity *conditional on formal-sector employment*. This conditional interpretation remains policy-relevant for two reasons. First, unionization and collective bargaining agreements exist exclusively within the formal sector. Workers who form unions and negotiate CBAs have already selected into formal employment, and the relevant question is whether employer concentration within that sector affects their collective bargaining outcomes. Second, if informal employment serves as an outside option that constrains formal employers' wage-setting power, this will bias our estimates *toward zero*: we would be less likely to detect relationships between concentration and bargaining outcomes, making our findings conservative. We recognize that these limitations constrain us to define local labor markets and union activity much more broadly than ideal from a theoretical standpoint and the common approaches in the literature.

3.3. Estimation

We estimate the relationship between labor market concentration and collective bargaining outcomes using logistic regression models, analyzing union registration and collective bargaining agreement provisions as separate binary outcomes. For each outcome, we employ two concentration measures, HHI and CR4, calculated across three dimensions: employment, payroll costs, and product market revenues. The annexes contain the estimates for subcontracted employment. All concentration measures are standardized (mean of zero, standard deviation of one) to facilitate coefficient interpretation and comparison across specifications. We present

three nested model specifications for each concentration measure. The baseline specification includes only the continuous concentration metric and a binary indicator for absolute monopsony markets (fewer than four firms operating in the market in the CPBI data). The second specification incorporates region and industry fixed effects to absorb geographic and sectoral heterogeneity that may correlate with both concentration and collective bargaining outcomes. The third specification adds labor market-specific control variables to account for additional observable characteristics that may confound the concentration-bargaining relationship, namely total employment to control for market size, average firm size to account for market scope and density, and average firm costs to account for regional and sectoral wage premia, all log-transformed.

Coefficients are reported as odds ratios, with values below one, indicating that higher concentration is associated with lower odds of the outcome. To facilitate substantive interpretation of effect sizes, we also present predicted probability plots that trace the estimated probability of new union registration and collective bargaining activity across the distribution of employment concentration, ranging from one standard deviation below the mean (low concentration) to three standard deviations above (extreme concentration), holding all other variables at their means.

4. Results and discussion

4.1. Concentration and union activity across local labor markets

Philippine local labor markets exhibit markedly high concentration levels even under a considerably broad local labor market definition. As shown in Table 1, the share of highly concentrated markets varies considerably across measurement approaches: 26 percent when using employment-based HHI, 42 percent using payroll HHI, 41 percent using product market (revenue) HHI, and 65 percent using subcontracted employment HHI. These figures substantially exceed the US baseline, suggesting that employer concentration is a more pervasive feature of Philippine labor markets. Azar et al. [2020] estimate, using vacancy HHIs at the state \times occupation level, that only seven percent of US local labor markets are highly concentrated in the broadest possible definition, with this share rising substantially as markets are defined more narrowly (60 percent under commuting zone definitions, 78 percent under county-level definitions). Applying the logic from Azar et al. [2020] to our context reinforces the intuition that our broad market definition plausibly understates the true degree of employer concentration that workers experience. The figures in Table 1 almost certainly represent lower bounds. If occupation-specific data and finer geographic units were available, the prevalence of highly concentrated markets would plausibly be substantially higher. This conservative measurement framework means that any observed association between concentration and collective bargaining outcomes emerges despite measurement error that biases against finding effects.

TABLE 1. Summary statistics of key variables of interest across local labor markets

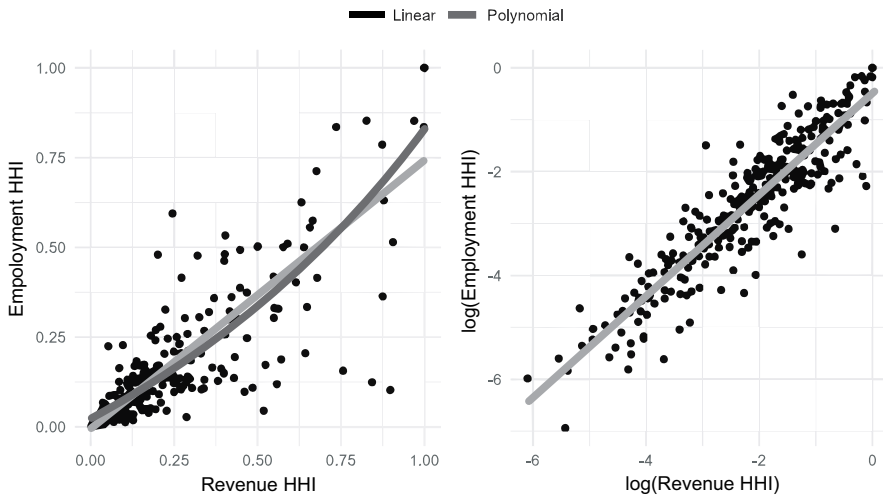
	n	Mean	SD	Min-Max	Median	Share Highly Concentrated
Herfindahl-Hirschman Index (HHI)						HHI \geq 0.18
Employment	300	0.163	0.210	0.00-1.00	0.089	0.260
Payroll (Labor Cost)	276	0.247	0.284	0.00-1.00	0.147	0.424
Product Market (Revenue)	299	0.224	0.241	0.00-1.00	0.133	0.405
Subcontracted Employment	260	0.390	0.312	0.00-1.00	0.308	0.654
Four-Firm Concentration Measures (CR4)						CR4 \geq 0.8
Employment	300	0.507	0.290	0.02-1.00	0.480	0.193
Payroll (Labor Cost)	281	0.474	0.321	0.00-1.00	0.440	0.217
Product Market (Revenue)	300	0.464	0.318	0.01-1.00	0.429	0.207
Subcontracted Employment	260	0.306	0.347	0.00-1.00	0.158	0.138
Union Activity Outcomes						
New Union Registration	300	0.267	0.443	0.00-1.00	0.000	-
New Collective Bargaining Agreement	300	0.367	0.483	0.00-1.00	0.000	-
Union Density (Average from 2016-2021)	74	0.516	0.226	0.04-1.00	0.488	-

Meanwhile, the CR4 measures present a complementary perspective on market structure. Between 14 percent and 22 percent of markets exhibit high CR4 concentration ($CR4 \geq 0.8$), depending on the measurement base, with employment-based CR4 showing 19 percent of markets as highly concentrated. Notably, subcontracted employment exhibits contrasting patterns across metrics: while 65 percent of markets are highly concentrated under the HHI measure, only 14 percent exceed the CR4 threshold. This divergence reflects the different properties of these indices. HHI is more sensitive to the full firm-size distribution and assigns greater weight to dominant firms, whereas CR4 focuses exclusively on the top four firms and is less affected by the competitive fringe or outliers. The substantial gap between HHI and CR4 for subcontracted employment (means of 0.390 vs. 0.306) suggests that while a few firms dominate subcontracted labor arrangements in many markets, the concentration of market share among the very largest firms is less extreme than the overall distributional inequality captured by HHI. These measurement differences underscore the value of examining multiple concentration metrics, as each captures distinct dimensions of market structure relevant to assessing employer market power.

Tangentially, we note that product-market concentration and labor-market concentration are strongly positively correlated within local markets. Figure 1

presents scatterplots of revenue-based HHI against employment-based HHI, shown both in levels (left panel) and in logs (right panel). The relationship is approximately linear in both specifications, with a correlation coefficient of 0.86, indicating that markets with high seller concentration also tend to have high employer concentration. This pattern suggests that market power in the Philippines is frequently bilateral, such that firms that possess price-setting power in product markets simultaneously exercise wage-setting power in labor markets.

FIGURE 1. Local product and labor market concentration



This empirical relationship has implications for understanding union activity. Standard economic theory predicts that deviations from perfect competition generate economic rents, either monopoly rents from product market power or monopsony rents from labor market power. When both forms of market power coexist, firms capture rents on both margins by plausibly charging prices above marginal cost to consumers while paying wages below marginal revenue product to workers. The presence of these quasi-rents creates scope for rent-sharing through collective bargaining. Workers in concentrated labor markets face fewer outside options and therefore have strong incentives to organize collectively to capture a share of firm rents that would otherwise accrue entirely to employers. Moreover, the absorptive capacity for wage increases is greater in firms with substantial product market power, as excess profit margins provide a buffer against labor cost increases without threatening firm viability. This framework implies that the joint presence of product- and labor-market concentration may amplify both the incentives for unionization and the potential gains from collective bargaining.

This observed correlation may also simply reflect the geographic distribution of firm size rather than causal market power. Relatedly, concentration may also reflect economies of scale, sector-specific entry conditions, or productivity differences that allow larger firms to emerge in particular industry-region markets, rather than the exercise of labor market power alone. In less urbanized regions with thinner markets, a single large firm may dominate both product sales and local employment simply due to scale, mechanically generating high concentration on both dimensions without necessarily exercising strategic market power. Disentangling these mechanisms remains an empirical challenge, though both interpretations are consistent with the broader finding that Philippine labor markets exhibit substantial employer concentration.

4.2. *New union registrations*

Table 2 shows odds ratios from logistic regression models of new union registration. The central finding is consistent and robust—higher employer concentration is associated with substantially lower odds of new union formation across nearly all specifications and concentration measures. Employment-based concentration measures yield the most robust negative associations. A one-standard-deviation increase in employment HHI reduces the odds of new union registration by 62 to 84 percent, depending on the specification (odds ratios of 0.382 in the intermediate model and 0.276 in the fully saturated model), with all coefficients statistically significant at conventional levels. Employment CR4 exhibits similar patterns, with odds ratios ranging from 0.330 to 0.391 in models with fixed effects and controls. Product market concentration tells a similar story. Product market concentration, measured by revenue HHI and CR4, is negatively associated with unionization, with odds ratios ranging from 0.323 to 0.577 for HHI and 0.503 to 0.933 for CR4, though statistical significance attenuates somewhat in the most saturated specifications as standard errors increase with the inclusion of market-level controls. This departs from earlier US patterns in the 1960s and 1970s, wherein markets with “higher quasi-rents” had higher union activity [Abowd and Farber 1990]. Meanwhile, the payroll-based concentration measures have a more nuanced pattern. Payroll HHI and CR4 show negative associations with union registration in the reduced-form specifications, but these associations become statistically insignificant once region and industry dummies and other controls are included.

Following the fully specified logistic regression models, we obtain predicted probabilities of new union registration across varying levels of employment concentration for ease of interpretation on the probability rather than the odds scale. Figure 2 shows that for local labor markets without an absolute monopoly and with an average level of employment concentration, the predicted probability of having a new union registration is around 28 percent. From this average, a one-standard-deviation increase in employment HHI and CR4 is associated with a 12 pp

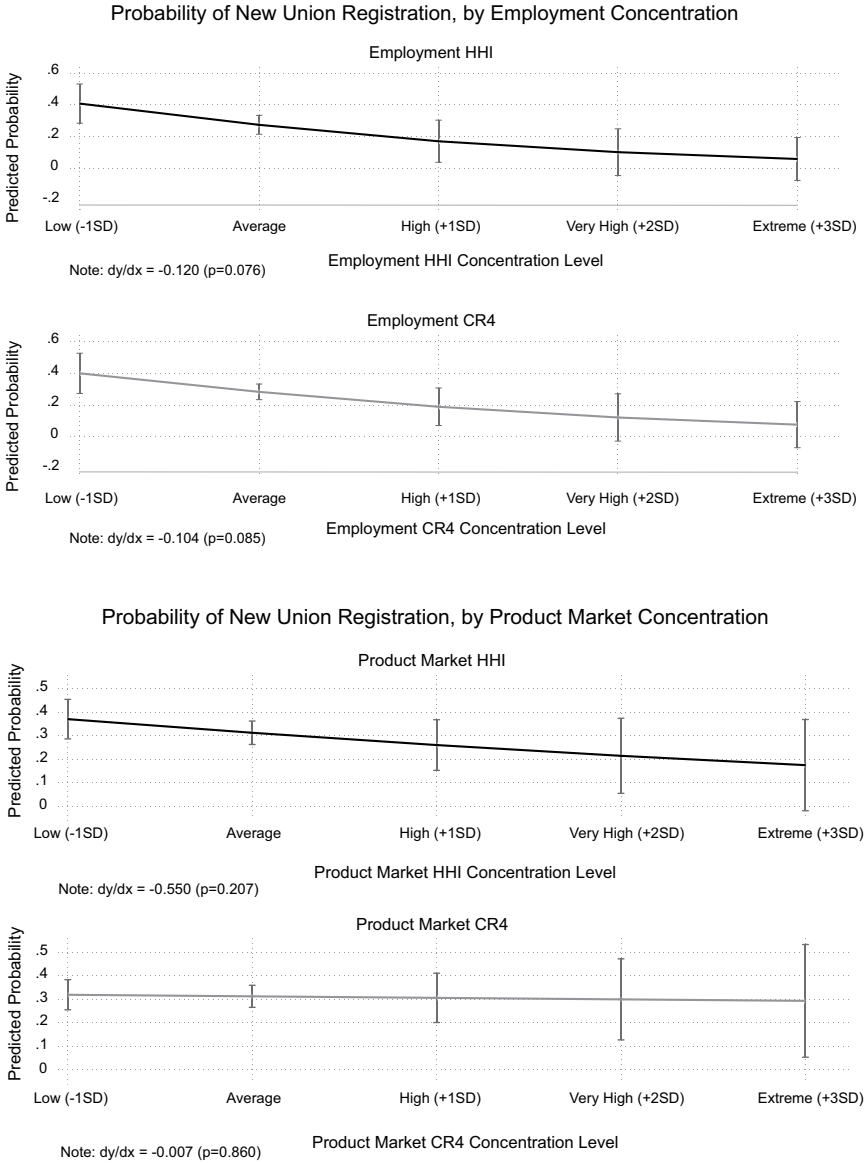
and 10 pp lower probability of having a new union in the market, respectively. Meanwhile, product market concentration, measured using HHI and CR4, is not significantly associated with union registration. The top panels of Annex 4 and 5 show the association between union registration and payroll and subcontracted employment concentration, respectively.

TABLE 2. Regression results for new union registration (odds ratios)

Variables	Herfindahl-Hirschman Index (HHI)			4-Firm Concentration Ratio (CR4)		
	(1)	(2)	(3)	(4)	(5)	(6)
Employment						
z_Employment HHI	0.155*** (0.078)	0.382* (0.195)	0.276* (0.199)			
z_Employment CR4				0.369*** (0.070)	0.391** (0.175)	0.330* (0.208)
Observations	300	254	250	300	254	250
Payroll (Labor Cost)						
z_Payroll HHI	0.519** (0.154)	0.627 (0.295)	0.609 (0.258)			
z_Payroll CR4				0.533*** (0.093)	0.800 (0.309)	0.629 (0.259)
Observations	276	215	215	281	246	246
Product Market (Revenues)						
z_Revenue HHI	0.323*** (0.121)	0.499* (0.196)	0.577 (0.250)			
z_Revenues CR4				0.503*** (0.087)	0.869 (0.291)	0.933 (0.365)
Observations	299	240	236	300	254	250
CONTROLS						
Absolute monopoly market	Yes	Yes	Yes	Yes	Yes	Yes
ln_total_employment	No	No	Yes	No	No	Yes
ln_avg_firm_size	No	No	Yes	No	No	Yes
ln_avg_labor_cost	No	No	Yes	No	No	Yes
Region FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	Yes	No	Yes	Yes

Note: z_ denotes standardized values and these estimates are exponentiated coefficients and should therefore be interpreted as odds ratios (relative to 1=having a new union). The full regression results, including parameter estimates for all controls, are shown in the Annexes. Each model is estimated separately without data imputation and with robust standard errors enclosed in parentheses.

FIGURE 2. Predicted probabilities of new union registrations by market concentration



Union Density. When looking specifically at the average union density of those new union registrations, we present its pairwise correlation statistics with each concentration measure. As noted in Table 1, missing union density data and the low incidence of local labor markets with new union registrations during our sample period yield only 74 observations with valid average union density measures.

This constrains us from modeling this variable formally in a regression framework with adequate statistical power. Nevertheless, the correlations provide suggestive evidence consistent with the union registration findings. A one-standard-deviation increase in employment HHI is associated with a 0.251 decrease in union density ($p = 0.031$), indicating that in more concentrated labor markets, not only are workers less likely to form unions, but when unions do emerge, they attract a smaller share of the eligible workforce. Payroll HHI exhibits a similar negative association ($r = -0.230$, $p = 0.060$), significant at the 10 percent level. The CR4 measures and product market concentration indicators show negative point estimates but fail to reach conventional significance thresholds, likely reflecting both the reduced sample size and the greater measurement noise in these variables. The consistency of negative associations across employment-based and payroll-based HHI measures reinforces the interpretation that labor market concentration inhibits collective worker organization both in the extensive and intensive margins.

TABLE 3. Pairwise correlation between union density and concentration measures

Variable	Correlation (r)	sig	p-value
z_Employment HHI	-0.251	**	0.031
z_Employment CR4	-0.190		0.105
z_Payroll HHI	-0.230	*	0.060
z_Payroll CR4	-0.054		0.650
z_Revenues HHI	-0.122		0.305
z_Revenues CR4	-0.178		0.130
z_Subcontracted Employment HHI	0.040		0.741
z_Subcontracted Employment CR4	-0.017		0.884

4.3. Bargaining outcomes

Table 4 presents logistic regression estimates of the relationship between labor market concentration and the formation of new collective bargaining agreements, with coefficients again reported as odds ratios. The results mirror and extend the union registration findings: higher employer concentration is associated with substantially lower odds of successful collective bargaining agreement formation across all concentration measures and specifications. Subcontracted employment concentration exhibits the most dramatic negative associations. A one-standard-deviation increase in subcontracted employment HHI reduces the odds of CBA formation by 61 to 85 percent (odds ratios ranging from 0.153 to 0.389), with all coefficients statistically significant across specifications. Subcontracted employment CR4 shows similarly robust negative effects (odds

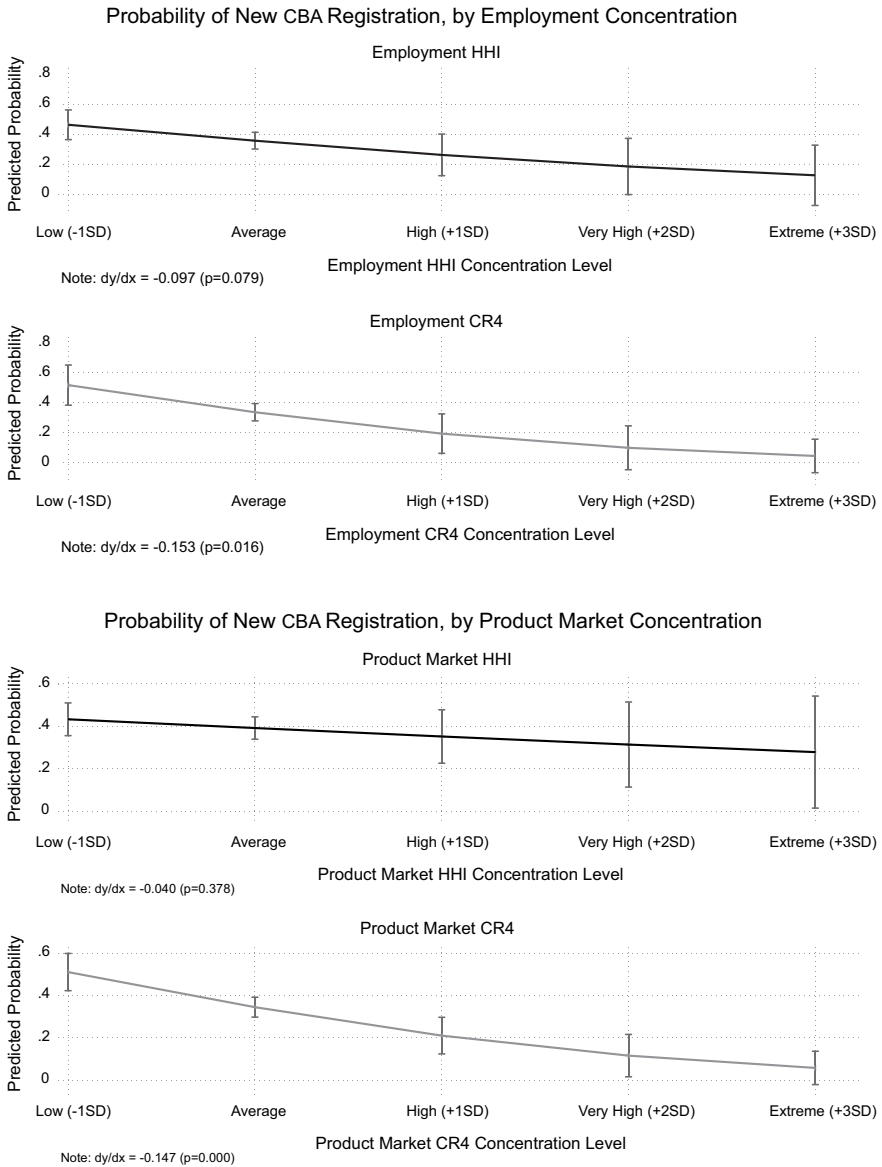
ratios ranging from 0.214 to 0.316). Payroll-based concentration measures, which showed inconsistent results for union registration, now demonstrate strong and stable negative associations with CBA formation: payroll HHI yields odds ratios ranging from 0.266 to 0.477, while payroll CR4 ranges from 0.238 to 0.432, all highly significant even in the fully saturated model with region, industry, and market-level controls. Product market concentration continues to predict lower CBA formation, though with some attenuation in the fully specified models.

TABLE 4. Regression results for new collective bargaining agreements (odds ratios)

Variables	Herfindahl-Hirschman Index (HHI)			4-Firm Concentration Ratio (CR4)		
	(1)	(2)	(3)	(4)	(5)	(6)
Employment Total						
z_Employment HHI	0.153*** (0.070)	0.319** (0.182)	0.389* (0.212)			
z_Employment CR4				0.316*** (0.058)	0.214*** (0.091)	0.224** (0.144)
Observations	300	283	274	300	283	274
Payroll (Labor Cost)						
z_Payroll HHI	0.477*** (0.124)	0.310** (0.160)	0.256* (0.181)			
z_Payroll CR4				0.432*** (0.075)	0.346*** (0.129)	0.238*** (0.119)
Observations	276	236	236	281	254	254
Product Market (Revenues)						
z_Revenue HHI	0.348*** (0.107)	0.516* (0.194)	0.697 (0.288)			
z_Revenues CR4				0.397*** (0.068)	0.284*** (0.095)	0.224*** (0.101)
Observations	299	269	260	300	283	274
CONTROLS						
Absolute monopoly market	Yes	Yes	Yes	Yes	Yes	Yes
ln_total_employment	No	No	Yes	No	No	Yes
ln_avg_firm_size	No	No	Yes	No	No	Yes
ln_avg_labor_cost	No	No	Yes	No	No	Yes
Region FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	Yes	No	Yes	Yes

Note: z_ denotes standardized values and these estimates are exponentiated coefficients and should therefore be interpreted as odds ratios (relative to 1=having a new union). The full regression results, including parameter estimates for all controls, are shown in the Annexes. Each model is estimated separately without data imputation and with robust standard errors enclosed in parentheses.

FIGURE 3. Predicted probabilities of new CBA registrations by market concentration



Following the fully specified logistic regression models, we again obtain predicted probabilities of new collective bargaining agreements across varying levels of employment and revenue concentration for ease of interpretation on the probability rather than the odds scale. Figure 3 shows that for local labor markets without an absolute monopoly and with an average level of employment

concentration, the predicted probability of having a new collective agreement is around 38 percent. From this average, a one-standard-deviation increase in employment HHI and CR4 is associated with a 9.7 pp and 15.3 pp lower probability of having a new collective agreement, respectively. Meanwhile, product market concentration, measured using CR4, is also negatively and significantly associated with union registration. The bottom panels of Annex 4 and 5 show the association between collective agreements and payroll and subcontracted employment concentration, respectively.

These findings carry important implications for understanding the interplay between concentration and collective bargaining. The established literature demonstrates that employer concentration suppresses wages and employment outcomes through direct monopsony channels (Azar et al. [2020]; Berger et al. [2022]). Our results indicate that monopsony power extends beyond its direct wage effects and may undermine workers' capacity to organize collectively and negotiate formal agreements. This represents a compounding mechanism in which concentrated labor markets not only enable employers to extract monopsony rents through wage suppression but also create structural barriers to workers' voice institutions that, economic theory suggests, could mitigate monopsony power by countervailing employer market power (Naidu et al. [2018]; Qiu and Sojourner [2023]). In competitive labor markets with excess profits or rents, unions can bargain for redistribution of those rents through higher wages and improved working conditions without threatening firm viability. The negative concentration-bargaining gradient we observe suggests that precisely where such countervailing power would generate the largest potential welfare gains for workers, it is least likely to emerge.

5. Implications and conclusions

5.1. Summary

Our empirical analyses reveal a robust negative association between employer concentration and union activity across broadly defined Philippine labor markets. A one standard deviation increase in employment-based HHI is associated with a 12 pp lower probability of new union registration and a 9.7 pp lower probability of new collective bargaining agreement, with the employment CR4 measures exhibiting comparable estimates (10.4 and 15.3 percentage points, respectively). These associations persist across multiple model specifications that progressively absorb regional and sectoral variation and other observable labor market characteristics. The concentration in the scope of employment is concerning. Between 19 percent and 65 percent of all local labor markets qualify as highly concentrated, depending on the measurement approach. These figures substantially exceed comparable US estimates and likely understate true

concentration given our broad market definitions. Notably, product market and labor market concentration are strongly correlated ($r = 0.86$), indicating that firms dominating local product markets tend simultaneously to dominate local labor markets, creating bilateral market power that yields implications for both consumers and workers. Even among labor markets where unions successfully form, employment HHI correlates negatively with union density, suggesting that employer market power operates on both the extensive margin (union formation) and the intensive margin (union size).

These results extend the labor market monopsony literature beyond its traditional focus on wage and employment outcomes to encompass institutional outcomes that mediate workers' capacity to mitigate employer power. It is well-established that employer concentration is associated with wage suppression (Azar et al. [2020]; Benmelech et al. [2022]) and lower aggregate employment [Qiu and Sojourner 2023]. Consequently, related works by Naidu et al. [2018] and Qiu and Sojourner [2023] argue that unions can serve as countervailing forces that compress wage distributions and capture firm rents in imperfectly competitive labor markets. Our results, consistent with causal findings by Choper et al. [2026], show a negative concentration-union activity gradient. Without causally interpreting our findings, these associations suggest that unions and collective agreements are least likely to be present in markets where potential welfare gains are largest.

5.2. Limitations

Several limitations qualify our findings and suggest avenues for refinement in future research. First, our local labor market definition at the regional and sectoral level is considerably broader than the more spatially disaggregated definitions used in the literature. This is driven by the available industry and spatial information in our datasets. While we argue that this broad definition plausibly underestimates the association between concentration and union activity, the resulting measurement error nevertheless introduces noise that may attenuate our estimates of the concentration-bargaining relationship. The true effect sizes could be larger and, indeed, concentrated in select sub-sectors and provinces or cities.

Second, our concentration measures capture only formal sector employers and employment. The Philippine labor market is characterized by substantial informality, particularly in less urbanized regions. If informal employment serves as a viable outside option that constrains formal employers' monopsony power, then our concentration measures overstate the effective market power that formal-sector workers face, and our estimates would be biased toward zero. Specifically, we would underestimate the observed negative association between labor market concentration and unionization. Conversely, if informal and formal employment are distinct and segmented markets due to differences in job quality, stability, or social protection, as demonstrated in prior literature [Dell'Anno 2021], then our

conditional-on-formality estimates appropriately capture the relevant segments for our outcome of interest (e.g., union activity). For future research where the outcome of interest is less confined to either segment, unlike union activity, defining local labor markets would have to account for the informal sector more explicitly.

Third, our analysis is associational rather than causal. While the inclusion of region and industry dummies absorbs time-invariant geographic and sectoral heterogeneity, and the inclusion of controls accounts for market size and wage differentials, we are not definitively ruling out unobserved confounders that drive both concentration and unionization patterns. For instance, areas with weak state capacity or labor institutions might simultaneously exhibit high concentration (due to lax antitrust enforcement) and low unionization (due to weak legal protections or enforcement). Credibly identifying the causal effect of concentration on collective bargaining would require either exogenous variation in market structure generated, for example, by quasi-experimental policy shocks or merger events, or valid instrumental variables that shift concentration without directly affecting unionization propensities. The limited number of local labor markets in our sample and the cross-sectional structure of the data constrain the set of feasible identification strategies. Azar et al. [2020] analyzed thousands of disaggregated labor markets and utilized BLP-style instruments constructed from the characteristics of a firm's competitors in other markets, following Berry, Levinsohn, and Pakes [1995]. In the absence of geocoded firm-level data with detailed characteristics, such approaches are not viable for our analysis. Consequently, future research with more disaggregated market definitions would be better positioned to pursue instrumental variable designs to strengthen causal inference.

Fourth, our outcome measures capture only formal union registration and CBA formation, not the substantive content of collective agreements or the actual wage and benefit gains workers secure through bargaining. A complete assessment of how concentration affects worker welfare through the bargaining channel would require linking concentration measures to the specific provisions negotiated in CBAs, including wage floors, benefit packages, job security protections, and ultimately to worker-level earnings and employment outcomes. While such analysis is beyond the scope of this paper, it represents a critical direction for understanding the full welfare consequences of labor market concentration in settings with active collective bargaining institutions.

5.3. Charting the course for labor market concentration research

Over the past decade, academic and policy discussions have increasingly centered on power asymmetries in labor markets, recognizing that the excessive wage-setting and term-setting power that firms possess generates adverse consequences for wages and employment. A robust strand of the literature has demonstrated that employers possess considerable monopsony-like power

that partly accounts for both rising between-worker inequality and declining labor shares of national income [Manning 2021]. However, the labor market monopsony literature remains limited both in the scope of contexts analyzed by being predominantly focused on the United States and Western Europe, and in the types of outcomes considered.

This article makes several contributions that chart directions for future research on labor market concentration in developing country contexts. First, we provide the first estimates of labor market concentration measures for the Philippines using comprehensive administrative data from the Census of Philippine Business and Industry. The CPBI offers advantages over survey-based data sources: universal coverage of formal sector establishments, detailed revenue and employment information enabling multiple concentration metrics, and consistent industry classifications. Our results demonstrate the feasibility and utility of applying the analytical toolkit developed in the US and European labor monopsony literature to emerging market settings where data constraints have historically limited such analysis.

Second, the strong correlation we document between product and labor market concentration raises questions about the coevolution of market power across output and input markets. Does product-market dominance facilitate labor-market monopsony by generating the economic resources to pursue aggressive labor-cost minimization strategies? Do firms strategically pursue market power on both the demand and supply sides simultaneously? Does common ownership or vertical integration create linkages between product and labor market structures? These questions point toward research that integrates labor economics with industrial organization to understand market power more broadly. These policy-relevant questions have been undertaken by the US Department of Treasury [2022], which issued a comprehensive guidance on labor market competition policy, the Federal Trade Commission, which proposed banning noncompete agreements in employment contracts, and other competition authorities in the United Kingdom and Australia that have announced efforts to identify potential harms in labor markets. For the Philippine Competition Commission, assessing employer power not only in downstream product markets but also in upstream labor markets will offer a more comprehensive determination of welfare losses.

By examining both union activity and collective bargaining outcomes, this paper expands research on labor market concentration beyond its predominant focus on wages and employment levels. Much of the existing literature shows that employer concentration suppresses compensation, but less is known about how concentration shapes the conditions under which workers organize and bargain. The re-emergence of this agenda across economics, sociology, and industrial relations points to a broader open question: whether employers' persistent term-setting power is not only a cause of weaker worker voice institutions but also a consequence of their decline.

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Annexes

ANNEX 1. Local labor markets with the highest Employment HHI

Local Labor Market	Employment HHI
Information and Communication—BARMM	1.000
Financial and Insurance Activities—BARMM	1.000
Real Estate Activities—BARMM	1.000
Professional, Scientific and Technical Activities—Zamboanga Peninsula	1.000
Administrative and Support Service Activities—BARMM	1.000
Other Services Activities—Eastern Visayas	1.000
Other Services Activities—SOCCSKSARGEN	1.000
Professional, Scientific and Technical Activities—Eastern Visayas	0.853
Mining and Quarrying—Western Visayas	0.852
Mining and Quarrying—Davao Region	0.835
Mining and Quarrying—Zamboanga Peninsula	0.835
Transport and Storage—BARMM	0.786
Real Estate Activities—Cagayan Valley	0.631
Arts, Entertainment and Recreation—Cagayan Valley	0.626
Information and Communication—Eastern Visayas	0.594

ANNEX 2. Local labor markets with the highest Payroll HHI

Local Labor Market	Payroll HHI
Electricity, Gas, Steam and Air Conditioning Supply—Northern Mindanao	1.000
Electricity, Gas, Steam and Air Conditioning Supply—Davao Region	1.000
Electricity, Gas, Steam and Air Conditioning Supply—National Capital Region	1.000
Water Supply; Sewerage, Waste Management and Remediation Activities—Cagayan Valley	1.000
Water Supply; Sewerage, Waste Management and Remediation Activities—Western Visayas	1.000
Water Supply; Sewerage, Waste Management and Remediation Activities—Zamboanga Peninsula	1.000
Water Supply; Sewerage, Waste Management and Remediation Activities—National Capital Region	1.000

ANNEX 2. Local labor markets with the highest Payroll HHI (continued)

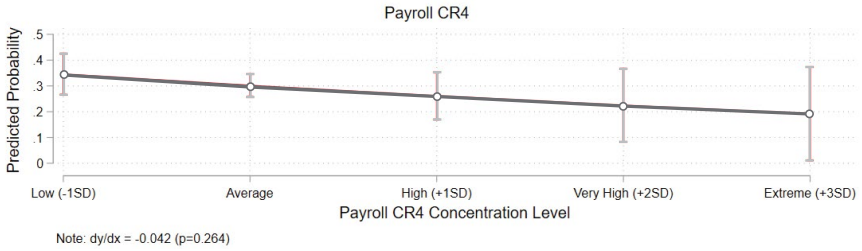
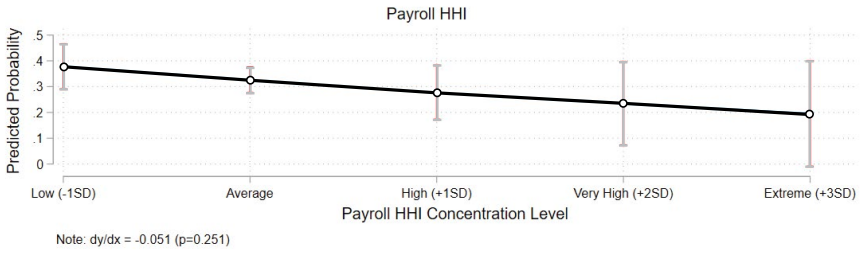
Local Labor Market	Payroll HHI
Water Supply; Sewerage, Waste Management and Remediation Activities—Cordillera Administrative Region	1.000
Water Supply; Sewerage, Waste Management and Remediation Activities—.Caraga	1.000
Information and Communication—BARMM	1.000
Financial and Insurance Activities—BARMM	1.000
Real Estate Activities—BARMM	1.000
Professional, Scientific and Technical Activities—Zamboanga Peninsula	1.000
Administrative and support Service Activities—BARMM	1.000
Other Services Activities—Eastern Visayas	1.000

ANNEX 3. Local labor markets with the highest Revenue HHI

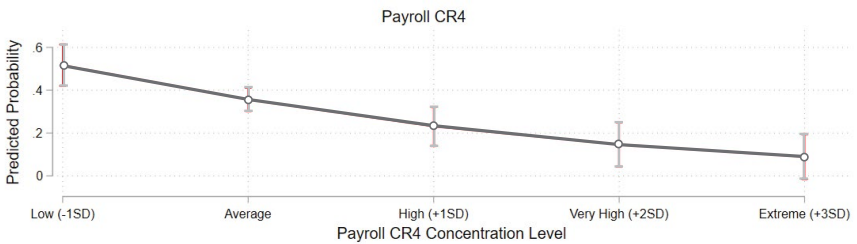
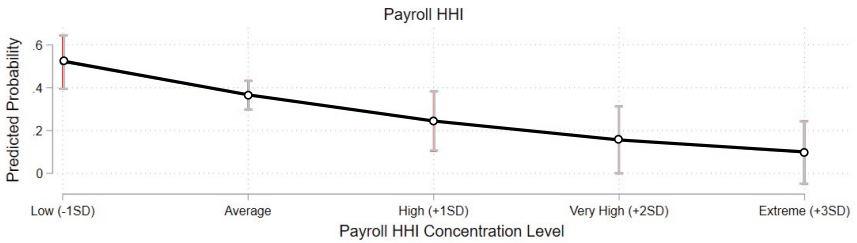
Local Labor Market	Revenue HHI
Information and Communication—BARMM	1.000
Financial and Insurance Activities—BARMM	1.000
Real Estate Activities—BARMM	1.000
Professional, Scientific and Technical Activities—Zamboanga Peninsula	1.000
Administrative and Support Service Activities—BARMM	1.000
Other Services Activities—Eastern Visayas	1.000
Other Services Activities—SOCCSKSARGEN	1.000
Mining and Quarrying—Zamboanga Peninsula	0.998
Mining and Quarrying—Western Visayas	0.969
Mining and Quarrying—Bicol Region	0.906
Arts, Entertainment and Recreation—Eastern Visayas	0.898
Real Estate Activities—Cagayan Valley	0.878
Real Estate Activities—Caraga	0.875
Transport and Storage—BARMM	0.874
Manufacturing—Eastern Visayas	0.843

ANNEX 4. Predicted probabilities of new union activity by payroll concentration

Probability of New Union Registration, by Payroll Concentration

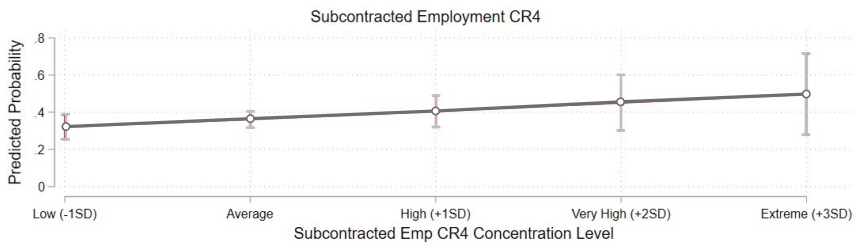
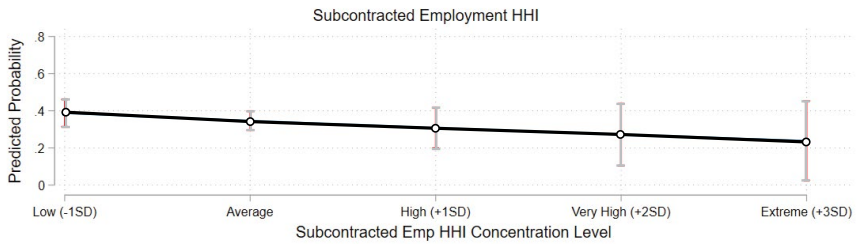


Probability of New CBA Registration, by Payroll Concentration

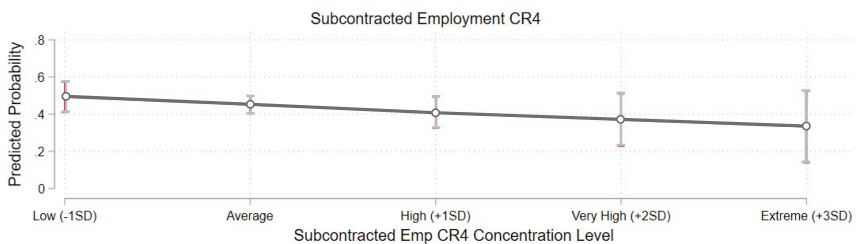
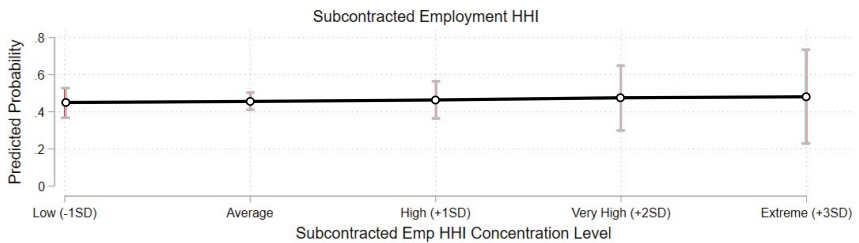


ANNEX 5. Predicted probabilities of new union activity by subcontracted employment concentration

Probability of New Union Registration, by Subcontracting Concentration



Probability of New CBA Registration, by Subcontracting Concentration





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