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Does Market Concentration Always Empower Firms? Evidence from City-Tier Differences in Urban China

Zehao Lin

Department of Economics, The Ohio State University, Columbus, USA
lin.4528@buckeyemail.osu.edu

Abstract. China's rapid urbanization has led to stark regional disparities in market structure, institutional capacity, and regulatory enforcement across cities. While classical industrial organization theory posits a positive link between market concentration and firm-level pricing power, this relationship may be moderated by spatial and institutional heterogeneity. However, existing empirical studies often assume uniform institutional environments, overlooking the potential variation across city tiers in China. Therefore, this paper aims to examine how the relationship between industry concentration and firm-level pricing power varies across urban contexts. Using panel data of Chinese A-share listed firms from 2017 to 2021, the study constructs city–industry-level Herfindahl–Hirschman Index (HHI) and firm-level Lerner indices to capture market structure and pricing behavior. Fixed-effects regressions are conducted separately for first-tier and non-first-tier cities to account for regulatory and economic heterogeneity. Results demonstrate that in first-tier cities, higher industry concentration is significantly associated with lower pricing power, possibly due to stronger competition and regulatory oversight. In contrast, no significant relationship is found in non-first-tier cities. These findings highlight the importance of urban complexity and localized governance in shaping firm conduct, challenging the traditional assumption that concentration uniformly enhances market power. The study provides policy insights for designing tier-sensitive competition strategies.

Keywords: Market power, Herfindahl–Hirschman Index, Lerner index, Urban heterogeneity, City-tier structure

1. Introduction

China's rapid urbanization has led to pronounced regional disparities in industrial agglomeration, regulatory enforcement, and institutional quality across cities [1, 2]. Typically, first-tier cities exhibit higher industry concentration and stronger regulatory frameworks, whereas non-first-tier cities are characterized by fragmented markets, limited factor mobility, and weaker institutional foundations [3, 4]. Although classical industrial organization theory suggests greater market concentration enhances firm-level pricing power [5, 6], recent studies indicate this relationship is not uniformly positive and may depend significantly on local institutional environments [7].

Current literature largely overlooks how city-specific governance and regulatory intensity influence the relationship between market concentration and pricing power, creating a critical

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research gap [8]. Emerging evidence emphasizes that spatial structure and urban hierarchy significantly affect firm behavior, innovation incentives, and competitive dynamics [9, 10]. Despite sector-level studies in China suggesting a positive correlation between industry concentration and market power [11, 12], little research explicitly examines city-tier heterogeneity in this context.

This paper aims to address these limitations by empirically examining how the concentration–pricing power relationship varies systematically across first-tier and non-first-tier Chinese cities. Utilizing panel data of Chinese A-share listed firms from 2017–2021 and employing fixed-effects regressions separately by city-tier, the study highlights the crucial role of urban and institutional heterogeneity. Findings from this analysis can offer insights to formulate differentiated competition policies and regulatory strategies tailored to China's diverse urban landscapes.

2. Literature review

2.1. Relationship between industry concentration and market power

The Herfindahl–Hirschman Index (HHI) is a widely adopted metric for quantifying market concentration, while the Lerner index captures firm-level market power by measuring the markup of price over marginal cost [3, 4]. Traditional industrial organization theory posits a positive link between concentration and pricing power, assuming that fewer competitors enable firms to exert greater control over prices. Empirical studies from China's airline and banking sectors support this view, showing that increased HHI is associated with higher Lerner indices, indicating stronger pricing power [8, 9]. However, recent research challenges the universality of this relationship. In particular, it argues that market concentration does not inherently lead to monopolistic outcomes, especially in environments with intense competition, strong regulatory oversight, or high efficiency dispersion among firms. Such findings highlight the importance of incorporating institutional context when analyzing the concentration–power relationship [10].

2.2. Regional market structure and firm behavior

Regional spatial characteristics significantly shape firm behavior, particularly in transitional economies like China. Factors such as labor mobility, urban density, and infrastructure connectivity influence how firms compete and innovate [6, 7]. In regions with dense economic activity and integrated labor markets—such as the Yangtze River Delta—market dynamics are often shaped less by structural concentration and more by agglomeration effects and strategic interactions. Moreover, urban hierarchies reflect differences in consumer behavior, regulatory expectations, and institutional maturity. Research suggests that firms operating in first-tier cities, facing more sophisticated consumers and tighter oversight, behave differently from those in lower-tier cities. Thus, the city-tier structure serves as a critical moderator of how local market conditions affect firm conduct and performance [11].

2.3. National-level assumptions in international studies and their limitations in the Chinese context

Most international studies on market concentration and firm power adopt a national-level perspective and assume institutional homogeneity across regions [12]. While this approach may suit advanced economies with relatively uniform regulatory environments, it overlooks the institutional fragmentation common in large developing countries. In contrast, recent Chinese research emphasizes the significance of subnational variation. Differences in local governance, bureaucratic

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efficiency, and enforcement capabilities lead to divergent market conditions even within the same industry or policy regime [13]. This strand of literature underscores the need for spatially disaggregated analysis that captures how institutional heterogeneity and city-tier classification shape firm behavior, particularly in transitional settings where formal and informal rules coexist.

3. Data and variable description

This paper utilizes an unbalanced panel dataset of Chinese A-share listed companies from 2017 to 2021. Core firm-level information, including financial indicators, industry classification, and geographic location, is obtained from the CSMAR database [14]. To reflect city-level market structure, the HHI is calculated annually for each city and industry combination. Firm-level pricing power is measured using the Lerner index. To capture spatial heterogeneity, cities are categorized into two tiers shown in Table 1 according to their administrative status and economic prominence. Nineteen major metropolitan areas, including Beijing, Shanghai, Guangzhou, and Shenzhen, are classified as first-tier cities, while all remaining cities are considered non-first-tier. Year fixed effects are included to control for macroeconomic fluctuations and nationwide policy changes. Additional control variables may be incorporated in robustness checks depending on data availability.

Table 1. Variable definitions

City Tier	Sample Size	HHI Coefficient
First-tier	16,023	–4.272
Non-first-tier	13,657	–1.086

4. Empirical methodology

To estimate the impact of industry concentration on firm-level market power, this study adopts a fixed-effects regression model as follows:

$$\text{Lerner}_{it} = \alpha + \beta \cdot \text{HHI}_{it} + \lambda_t + \varepsilon_{it} \quad (1)$$

In this specification, Lerner_{it} denotes the Lerner index for firm i in year t, capturing the degree of market power. HHI_{it} represents the Herfindahl–Hirschman Index computed at the city–industry level, reflecting local market concentration. The term λt captures year fixed effects to control macroeconomic fluctuations and policy shocks, and ε_{it} is the idiosyncratic error term.

To examine heterogeneity across urban contexts, the sample is divided into two subgroups based on city classification: first-tier and non-first-tier cities. Instead of including interaction terms between city tier and market concentration, this paper adopts a subgroup regression approach to enable direct and intuitive comparisons. Separate regressions are estimated for each city group, and the estimated coefficients on HHI are compared in terms of magnitude, direction, and statistical significance.

5. Empirical results and discussion

5.1. Descriptive statistics

Preliminary descriptive statistics shown in Table 2 indicate that the average Lerner index is higher among firms in first-tier cities than in non-first-tier cities, implying greater firm-level pricing power

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in more developed urban environments. However, the HHI appears relatively similar across city tiers, suggesting that the level of industry concentration does not vary substantially between them. This divergence implies that differences in pricing power are unlikely to be driven solely by structural concentration. Instead, institutional, regulatory, and spatial factors—such as enforcement capacity, market sophistication, and inter-firm competition—may play a more significant role in shaping firm behavior across urban contexts, warranting further investigation through subsample regression analysis.

Table 2. Subsample regression results by city tier

City Tier	Sample Size	HHI Coefficient	Std. Error	p-value	Conclusion
First-tier	16,023	–4.272	1.4	0.002	Significant negative
Non-first-tier	13,657	–1.086	1.625	0.504	Not significant

5.2. Subsample regression results

To formally assess the heterogeneous relationship between industry concentration and firm market power across cities, this study conducts subsample regressions based on city tier. The regression outcomes are summarized below:

In first-tier cities, the coefficient on HHI is significantly negative at the 1% level, suggesting that higher industry concentration is associated with lower firm-level pricing power. This is an unexpected but interpretable result, potentially reflecting intense intra-industry competition or stricter regulatory oversight in economically advanced cities. In contrast, the coefficient for non-first-tier cities is statistically insignificant, indicating no meaningful link between market concentration and pricing power in these regions.

5.3. Interpretation of findings

In first-tier cities, the counterintuitive negative relationship between high market concentration and firm-level pricing power can be interpreted through efficiency-driven dynamics and urban economic complexity. Rather than exploiting dominance, firms in economically advanced cities often adopt competitive pricing strategies to retain market share and deter new entrants. Evidence from China's railway industry shows that even in highly concentrated regional bureaus, pricing power varies substantially due to interregional competition and strategic pricing [15]. Moreover, post-WTO internationalization of Chinese markets has intensified advertising competition and consumer awareness, especially in top-tier cities [16]. Firms operating in these environments face globalized standards of communication, branding, and responsiveness, which constrain their ability to exert market power through pricing. These dynamics suggest that urban economic maturity and international market exposure can suppress the expected positive link between concentration and markup power.

Institutional capacity across cities further shapes this relationship. Environmental regulatory enforcement in China is characterized by spatial strategic interactions, whereby cities with stronger governance tend to act more aggressively in policy enforcement to signal regulatory commitment [17]. This logic applies to pricing behavior as well—firms in first-tier cities often operate under stricter antitrust scrutiny and are more exposed to reputational constraints and policy evaluation systems. Additionally, spatial patterns of Chinese cities have evolved considerably due to transportation, administrative divisions, and city-industry integration, influencing capital flows and

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institutional effectiveness [3]. These urban spatial mechanisms interact with regulatory capacity to condition how market structure translates into firm conduct.

6. Conclusion

This paper demonstrates that the relationship between market concentration and firm-level market power varies significantly across urban contexts in China. In first-tier cities, higher industry concentration is associated with lower pricing power, which may be attributed to intensified competition and stronger regulatory enforcement. In contrast, no significant relationship is observed in non-first-tier cities, likely to reflect weaker institutional environments and less effective regulatory oversight. These findings challenge the conventional assumption that market concentration inherently enhances firm power and underscore the critical role of spatial and institutional heterogeneity in shaping industrial dynamics.

Although the analysis provides empirical evidence of city-tier heterogeneity, it does not directly capture specific institutional mechanisms such as local antitrust enforcement intensity, market entry barriers, or informal regulatory practices. Furthermore, the study focuses exclusively on publicly listed firms, which may limit the generalizability of the findings to smaller or non-listed enterprises. Future research could incorporate more granular policy indicators or adopt causal identification strategies to strengthen inference and broaden the scope of applicability.

In light of the findings, a differentiated approach to competition policy is warranted. For first-tier cities, regulatory efforts should emphasize behavioral oversight, including the monitoring of algorithmic pricing, the detection of collusion, and the prevention of dominance abuse. In non-first-tier cities, policy should prioritize structural market reforms aimed at reducing administrative monopolies, enhancing market transparency, and strengthening enforcement capacity. Integrating tailored competition indicators into local government performance evaluations may further align regulatory incentives with national objectives for fostering fair and efficient markets

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