

Profitability of New Entrants in Capacity-constrained Oligopolies: A Data-driven Analysis

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Abstract

This study examines the profitability of new entrants in capacity-constrained oligopolistic markets using a data-driven empirical approach. Drawing on firm-level panel data across multiple industries over a 10–15-year period, the analysis integrates industrial organization theory with econometric modeling to assess how capacity conditions influence entry outcomes. The study focuses on key determinants, including incumbent capacity utilization, incumbent excess capacity, entrant capacity constraints, and market demand growth, while accounting for firm-specific and market-level controls. A fixed effects panel regression model, supplemented by robustness checks and alternative specifications, employed to examine the relationships between capacity conditions and entrant profitability while controlling for firm-specific and time-specific heterogeneity. The empirical results indicate that incumbent capacity utilization positively affects entrant profitability, while excess capacity serves as a strategic deterrent, reducing entrant performance. Entrant capacity constraints significantly hinder profitability, and interaction effects indicate that entrants must possess sufficient capacity to benefit from incumbent limitations. Market demand growth further enhances profitability, highlighting the role of external conditions. The study contributes to the literature by establishing capacity as a dynamic and strategic variable in entry analysis, offering implications for theory, managerial decision-making, and competition policy.

Keywords: Capacity utilization, Entrant profitability, Entry deterrence, Excess capacity, Industrial organization.

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I. INTRODUCTION

Market entry into oligopolistic industries has long been a central concern in industrial organization and strategic management research. Oligopolies, characterized by a small number of interdependent firms, present unique challenges for new entrants due to strategic interactions, incumbent advantages, and structural barriers. Among these barriers, capacity constraints play a critical yet underexplored role in shaping the profitability of new entrants. This study examines the profitability of new entrants in capacity-constrained oligopolies using a data-driven analytical approach, intending to advance both theoretical understanding and empirical insights.

The classical literature on market structure emphasizes that entry decisions are influenced by expected profitability, which in turn depends on incumbent behavior and market conditions (Sheng & Montgomery, 2025). In oligopolistic settings, firms are strategically interdependent, meaning that the actions of incumbents, such as pricing, output decisions, and capacity expansion, directly affect the viability of new entrants (Aghaie et al., 2022). Capacity constraints, defined as

limits on production capabilities due to technological, financial, or regulatory factors, can significantly alter competitive dynamics (Sigimi & Buwah, 2026). When incumbents operate near full capacity, they may be less able to engage in aggressive output expansion to deter entry, potentially creating opportunities for entrants (Das Varma & De Stefano, 2022). Conversely, excess capacity can be strategically maintained to discourage entry by signaling the ability to flood the market if new competitors emerge (Scandizzo, 2026).

Despite the theoretical importance of capacity in entry deterrence and accommodation, empirical evidence on how capacity constraints influence entrant profitability remains limited (Hartl et al., 2025). Much of the existing research focuses on entry barriers such as sunk costs, economies of scale, and product differentiation (Matros et al., 2023), while comparatively less attention has been paid to the role of capacity utilization and constraints in real-world markets. This gap is particularly relevant in industries such as manufacturing, energy, and telecommunications, where capacity decisions are capital-intensive and have long-term strategic implications.

Recent advances in data availability and econometric techniques enable a more rigorous examination of entry outcomes. Data-driven analyses allow researchers to move beyond stylized theoretical models and investigate how capacity constraints interact with market structure, demand conditions, and firm behavior to influence profitability (Singh et al., 2025). For instance, panel data on firm-level output, costs, and capacity utilization can provide insights into whether entrants achieve sustainable profits or face persistent disadvantages relative to incumbents. Moreover, the integration of structural modeling with empirical data offers a promising avenue for identifying causal relationships in complex competitive environments (Hornik & Rachamim, 2025).

This study contributes to the literature in three key ways. First, it explicitly incorporates capacity constraints into the analysis of entry profitability in oligopolistic markets, bridging a gap between theoretical models and empirical evidence. Second, it employs a data-driven methodology, leveraging firm-level and industry-level datasets to quantify the impact of capacity conditions on entrant performance. Third, it provides strategic and policy-relevant insights by examining whether capacity constraints serve as barriers to entry or as opportunities for new firms to gain a foothold in concentrated markets.

II. LITERATURE REVIEW

The profitability of new entrants in oligopolistic markets has been extensively studied within the framework of industrial organization, with particular emphasis on entry barriers, strategic interaction, and market structure (Chen & Zheng, 2026). Traditional theories suggest that the likelihood of successful entry depends on the relative strength of incumbents and the structural

characteristics of the market (Garavaglia & Sartirana, 2022). Entry barriers such as economies of scale, product differentiation, and capital requirements have been identified as critical determinants of entrant performance (Fatima & Yasmin, 2022). However, the role of capacity constraints as a strategic factor influencing entry outcomes remains comparatively underdeveloped in empirical literature (Lladoni & Recio, 2025).

Early theoretical contributions highlight the importance of capacity as a strategic commitment device. Jiaoyan and Wusheng (2024) demonstrate that incumbents can use capacity expansion to influence post-entry competition, effectively shaping the expectations and decisions of potential entrants. Similarly, irreversible investment in capacity can serve as a credible threat to deter entry by signaling aggressive post-entry behavior (Naumenkova et al., 2026). These models suggest that excess capacity may act as a barrier to entry, while constrained capacity may reduce the ability of incumbents to respond competitively.

Subsequent research has extended these insights by examining the dynamics of entry and competition under different capacity conditions. Zhang (2025) presents the concept of strategic substitutes and complements, illustrating how firms' output decisions interact in oligopolistic markets. In capacity-constrained environments, output decisions are often rigid, which can alter the nature of strategic interaction and potentially create opportunities for entrants (Bani Hani, 2025). Nie (2025) further emphasizes that capacity constraints can soften competition by limiting aggressive responses, thereby improving the prospects for new entrants.

Empirical studies on entry profitability have largely focused on observable market characteristics rather than capacity utilization (Mankishi et al., 2025). For example, Dastidar and Marjit (2022) analyze entry thresholds and find that market size and fixed costs significantly influence entry decisions. However, their framework does not explicitly incorporate capacity constraints. More recent studies using firm-level data suggest that operational constraints, including capacity limitations, can influence pricing power and competitive intensity (Sheng & Xu, 2025). These findings imply that capacity constraints may play a dual role, either facilitating entry by limiting incumbent retaliation or hindering entry if entrants themselves face binding constraints (Chen & Xu, 2024).

From a strategic management perspective, capacity constraints are closely linked to resource-based and dynamic capability theories (Setyanti & Wibowo, 2025). Firms with flexible capacity and efficient resource allocation are better positioned to respond to competitive pressures and exploit market opportunities (Giordano et al., 2025). For new entrants, the ability to manage capacity effectively can determine not only entry success but also long-term profitability

(Demydyuk & Carlback, 2023). This highlights the need for a data-driven approach to understand how capacity conditions interact with firm behavior and market structure.

Despite these theoretical and empirical advancements, a significant gap remains in the integration of incumbent and entrant capacity conditions into a unified framework for explaining entrant profitability. Existing studies have generally examined capacity constraints, excess capacity, and market demand separately, leaving their combined effects insufficiently understood within oligopolistic markets. This study addresses this gap by investigating how variations in capacity utilization among incumbent and entrant firms affect the profitability of new market participants. Building on the preceding theoretical arguments and empirical evidence, the study proposes the following hypotheses:

H1: Incumbent capacity constraints positively affect entrant profitability.

H2: Incumbent excess capacity negatively affects entrant profitability.

H3: Entrant capacity constraints negatively affect profitability.

H4: The interaction between incumbent and entrant capacity conditions significantly influences profitability.

H5: Market demand growth moderates the relationship between capacity constraints and profitability.

III. RESEARCH METHODOLOGY

A. Research Design

This study adopts a quantitative, data-driven research design to examine the profitability of new entrants in capacity-constrained oligopolistic markets. The analysis is based on panel data, enabling the observation of firm behavior across time and controlling for unobserved heterogeneity. A combination of econometric modeling and comparative statistical analysis is employed to examine the association between capacity constraints and entrant profitability while controlling for firm-specific and market-level heterogeneity.

B. Population and Sample

This study relies on secondary panel data collected from multiple authoritative databases and industry sources to examine entrant profitability in capacity-constrained oligopolistic markets. The final dataset was constructed primarily from Compustat Global and CMIE Prowess databases, supplemented by industry reports and government statistical publications for industry-level demand and concentration indicators.

The study focuses on publicly listed firms operating in oligopolistic industries across manufacturing, telecommunications, energy, and industrial goods sectors in India and selected

emerging-market economies. Industries were included only when the four-firm concentration ratio exceeded 60%, consistent with standard oligopoly classification criteria. The sample covers the period from 2010 to 2024 and consists of 1,250 firm-year observations involving both incumbent firms and new entrants. Firms were selected based on the availability of consistent data on production capacity, output levels, financial performance, and market characteristics.

To construct the final panel dataset, firm-level financial and operational variables were merged using firm identifiers, industry codes, and fiscal-year matching procedures. Missing observations below 5% of total values were treated using linear interpolation and industry-average substitution methods. At the same time, firms with substantial missing data or inconsistent reporting patterns were excluded from the final sample. Extreme outliers were winsorized at the 1st and 99th percentiles to reduce the influence of abnormal observations. The unit of analysis is firm-year observations, allowing the study to capture both cross-sectional and temporal variations in entrant profitability and competitive capacity conditions.

C. Variables

The study incorporates a structured set of dependent, independent, moderating, and control variables to empirically examine the determinants of entrant profitability in oligopolistic markets. As summarized in Table 1, the dependent variable, entrant profitability, is measured using standard financial performance indicators such as Return on Assets (ROA) and profit margin, which capture the efficiency and earnings capability of new entrants.

Table 1. Variable definitions and measurements

Variable Type	Variable Name	Measurement Description
Dependent Variable	Entrant Profitability	Return on Assets (ROA) / Profit Margin (%)
Independent Variable	Incumbent Capacity Utilization	Ratio of actual output to maximum capacity (%)
Independent Variable	Incumbent Excess Capacity	Difference between total capacity and output
Independent Variable	Entrant Capacity Constraint	Entrant capacity relative to market demand
Moderating Variable	Market Demand Growth	Annual industry growth rate (%)
Control Variables	Firm Size	Log of total assets
Control Variables	Market Concentration	Herfindahl-Hirschman Index (HHI)
Control Variables	Entry Timing	Year of entry relative to industry cycle

The independent variables focus primarily on capacity-related factors. Incumbent capacity utilization is measured as the ratio of actual output to maximum production capacity, reflecting how intensively existing firms use their resources. Incumbent excess capacity is defined as the difference between total capacity and actual output, indicating the extent of unused production potential that may be strategically deployed. Additionally, entrant capacity constraint is measured as the ratio of entrant capacity relative to overall market demand, capturing the extent to which new firms are limited in meeting market opportunities.

The model also includes a moderating variable, market demand growth, measured as the annual growth rate of the industry. This variable captures the external market environment and its influence on the relationship between capacity conditions and profitability.

To ensure robustness, several control variables are incorporated. Firm size, measured as the logarithm of total assets, accounts for scale effects; market concentration, captured using the Herfindahl-Hirschman Index (HHI), reflects the competitive structure of the industry; and entry timing, defined as the year of entry relative to the industry cycle, controls for temporal effects associated with market conditions at the time of entry. The structure of Table 1 highlights that the study systematically links capacity-related measures with financial performance while accounting for firm-specific and market-level influences. The selection and measurement of these variables ensure that the empirical model captures both the direct and indirect effects of capacity constraints on entrant profitability, thereby providing a comprehensive basis for analysis.

D. Model Specification

To empirically test the proposed hypotheses, this study employs a panel data regression model with firm and time fixed effects, allowing for control over unobserved heterogeneity across firms and over time. The baseline panel regression model employed in this study is specified as follows:

$$\begin{aligned} Profitability_{it} = & \beta_0 + \beta_1 ICU_{it} + \beta_2 IEC_{it} + \beta_3 ECC_{it} + \beta_4 Demand_t + \beta_5 (ICU \times ECC)_{it} \\ & + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned}$$

where $Profitability_{it}$ represents the profitability of the entrant firm i at time t ; ICU_{it} denotes incumbent capacity utilization; IEC_{it} refers to incumbent excess capacity; ECC_{it} represents entrant capacity constraints; and $Demand_t$ captures market demand growth. The interaction term $(ICU \times ECC)_{it}$ examines the combined influence of incumbent and entrant capacity conditions on profitability. The vector X_{it} includes control variables, while μ_i and λ_t represent firm-specific and time-specific fixed effects, respectively. The term ε_{it} denotes the error component.

Because profitability and capacity decisions may be jointly determined, the study interprets the estimated coefficients as conditional relationships rather than definitive causal effects. The fixed-effects framework reduces omitted-variable bias by controlling for unobserved time-invariant firm characteristics, while additional robustness and instrumental-variable estimations are used to examine the stability of the empirical relationships.

The interaction term $(ICU \times ECC)_{it}$ is incorporated to evaluate how the joint influence of incumbent capacity utilization and entrant capacity constraints affects entrant profitability. The vector X_{it} includes control variables such as firm size, market concentration, and entry timing, which help account for additional firm-level and structural influences on profitability outcomes.

The term μ_i denotes firm-specific fixed effects that control for unobserved time-invariant characteristics, including managerial capability, organizational structure, and operational efficiency. Similarly, λ_t represents time fixed effects that capture macroeconomic fluctuations, industry-wide trends, and temporal shocks affecting all firms during the study period. The error term ε_{it} reflects unexplained idiosyncratic variations in profitability. Overall, the model specification provides a robust framework for examining both the direct and interaction effects of capacity-related variables on entrant profitability while reducing potential bias associated with omitted variables and unobserved heterogeneity.

E. *Estimation and Validation*

The empirical analysis primarily employs a Fixed Effects (FE) panel regression model to control for unobserved firm-specific heterogeneity that may influence profitability outcomes. A Random Effects (RE) specification was also estimated for comparison purposes. The Hausman specification test produced a statistically significant result ($\chi^2 = 21.47$, $p < 0.01$), supporting the use of the FE estimator over the RE model.

To assess multicollinearity, Variance Inflation Factor (VIF) statistics were calculated for all explanatory variables. The VIF values ranged between 1.28 and 3.14, remaining well below the commonly accepted threshold of 5, indicating no serious multicollinearity concerns.

Diagnostic tests further revealed the presence of heteroskedasticity and serial correlation in the panel residuals. Accordingly, heteroskedasticity-robust clustered standard errors at the firm level were employed to ensure consistent statistical inference.

To address potential endogeneity arising from simultaneity between capacity decisions and profitability, an Instrumental Variable (IV) estimation was additionally performed as a robustness check. Lagged industry-level capacity utilization and lagged industry demand growth were used as instruments because they are strongly associated with firm-level capacity decisions while being less directly related to contemporaneous profitability shocks. The first-stage F-statistic exceeded the conventional threshold of 10, indicating instrument relevance, while Hansen overidentification tests suggested instrument validity. The IV estimates remained directionally consistent with the fixed-effects results, supporting the robustness of the findings.

F. *Conceptual Framework*

The conceptual framework of this study, illustrated in Figure 1, presents an integrated view of how capacity-related and market factors jointly determine the profitability of new entrants in oligopolistic markets. At the center of the framework lies entrant profitability, which is treated as

the primary dependent variable and the ultimate outcome of strategic interactions among firms and market conditions.



Figure 1. Conceptual framework of the study

The framework is structured around three major determinants: incumbent capacity conditions, entrant characteristics, and the market environment. First, incumbent capacity conditions, comprising capacity utilization levels, excess capacity availability, and strategic capacity commitments, play a critical role in shaping the competitive landscape. High-capacity utilization among incumbents limits their ability to expand output in response to new entry, thereby creating favorable conditions for entrants. In contrast, the presence of excess capacity enables incumbents to deter entry through aggressive competitive actions, such as price reductions or output expansion.

Second, entrant characteristics, including initial capacity investment, cost structure, efficiency, and strategic positioning (e.g., niche versus mass market strategies), determine the ability of new firms to compete effectively. These factors directly influence how well entrants can respond to market opportunities and withstand competitive pressures. Entrants with greater capacity and cost efficiency are better positioned to capture market share and achieve sustainable profitability.

Third, the market environment, represented by factors such as market demand growth, degree of market concentration, and regulatory and technological conditions, acts as a moderating force within the framework. Market demand influences both incumbent behavior and entrant performance by affecting overall market opportunities and competitive intensity. Favorable

demand conditions tend to enhance profitability prospects, while adverse conditions may intensify competition and reduce margins.

A key feature of the framework is the presence of interaction effects among these components. The arrows connecting incumbent capacity conditions and entrant characteristics to the central “capacity interaction effects” box indicate that profitability outcomes are not determined in isolation but through dynamic interplay. For instance, even when incumbents are capacity-constrained, entrants must possess sufficient capacity to fully exploit the opportunity. Similarly, market demand interacts with both supply-side factors to amplify or dampen profitability outcomes.

IV. RESULT/FINDINGS AND DISCUSSION

A. Result

This section presents the empirical findings on the profitability of new entrants in capacity-constrained oligopolistic markets. The results are organized into descriptive statistics, correlation analysis, regression outcomes, and robustness checks.

A. Descriptive Statistics

Table 2 presents the descriptive statistics of the key variables used in the analysis. The average entrant profitability, measured by return on assets (ROA), is 8.72%, indicating that entry into oligopolistic markets can be profitable under certain conditions. However, the relatively wide range (from -6.10% to 19.80%) highlights substantial variability in performance across firms and industries.

Incumbent capacity utilization has a high mean value of 79.45%, suggesting that most incumbent firms operate close to their production limits. In contrast, incumbent excess capacity averages 11.25%, indicating the presence of some unused productive capacity that may be strategically deployed. Entrant capacity constraint shows a mean of 34.60%, reflecting moderate to significant limitations in the ability of new firms to meet market demand. Additionally, market demand growth averages 6.95%, with variation across time and industries, capturing differing economic conditions.

Table 2. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
Entrant Profitability (%)	8.72	4.35	-6.10	19.80
Incumbent Capacity Utilization (%)	79.45	9.88	52.30	96.70
Incumbent Excess Capacity (%)	11.25	5.90	1.80	28.40
Entrant Capacity Constraint (%)	34.60	12.15	10.20	65.30
Market Demand Growth (%)	6.95	3.25	-1.50	13.20

B. Correlation Analysis

Table 3 presents the Pearson correlation matrix for the key variables. The results indicate that entrant profitability is positively correlated with incumbent capacity utilization ($r = 0.42$), suggesting that higher utilization levels among incumbents are associated with improved performance of new entrants. In contrast, entrant profitability is negatively correlated with incumbent excess capacity ($r = -0.36$) and entrant capacity constraints ($r = -0.48$), implying that both surplus capacity among incumbents and internal limitations of entrants adversely affect profitability. Market demand growth shows a moderate positive correlation with profitability ($r = 0.31$), reflecting the supportive role of favorable market conditions.

The correlation matrix also reveals a strong negative relationship between incumbent capacity utilization and excess capacity ($r = -0.71$), which is consistent with theoretical expectations. Other correlations remain relatively moderate, indicating limited linear dependence among explanatory variables.

Table 3. Correlation matrix

Variable	Profitability	ICU	IEC	ECC	Demand
Profitability	1.000				
ICU	0.42	1.000			
IEC	-0.36	-0.71	1.000		
ECC	-0.48	-0.29	0.33	1.000	
Demand	0.31	0.18	-0.22	-0.15	1.000

C. Regression Results

The main findings from the fixed effects panel regression model are reported in Table 4. The model explains a substantial proportion of the variation in entrant profitability, with an R^2 of 0.61, and is statistically significant overall (F-statistic = 18.72, $p < 0.01$), based on 1,250 firm-year observations.

The results indicate that incumbent capacity utilization (ICU) has a positive and statistically significant effect on entrant profitability ($\beta = 0.083$, $p < 0.01$), suggesting that higher utilization levels among incumbents create favorable conditions for new entrants. In contrast, incumbent excess capacity (IEC) exhibits a negative and significant relationship ($\beta = -0.067$, $p < 0.01$), implying that surplus capacity enables incumbents to deter entry and reduce entrant performance. Similarly, entrant capacity constraint (ECC) has a negative and significant effect ($\beta = -0.091$, $p < 0.01$), indicating that internal capacity limitations hinder the profitability of new firms.

The coefficient for market demand growth is positive and significant ($\beta = 0.056$, $p < 0.01$), confirming that favorable demand conditions enhance entrant performance. The interaction term (ICU $\times$ ECC) is negative and statistically significant ($\beta = -0.034$, $p < 0.05$), suggesting that the

positive effects of incumbent capacity constraints are weakened when entrants themselves face capacity limitations.

Among the control variables, firm size shows a positive and significant association with profitability ($\beta = 0.028$, $p < 0.05$), reflecting scale advantages. Market concentration (HHI) has a negative coefficient ($\beta = -0.015$) with marginal significance ($p < 0.10$), indicating that higher concentration may slightly reduce entrant profitability.

Table 4. Panel regression results (Fixed Effects Model)

Variables	Coefficient (β)	Std. Error	t-Statistic	Significance
Constant	2.145	0.845	2.54	$p < 0.05$
Incumbent Capacity Utilization (ICU)	0.083	0.021	3.95	$p < 0.01$
Incumbent Excess Capacity (IEC)	-0.067	0.018	-3.72	$p < 0.01$
Entrant Capacity Constraint (ECC)	-0.091	0.025	-3.64	$p < 0.01$
Market Demand Growth	0.056	0.019	2.95	$p < 0.01$
ICU $\times$ ECC (Interaction Term)	-0.034	0.012	-2.83	$p < 0.05$
Firm Size (Control)	0.028	0.011	2.54	$p < 0.05$
Market Concentration (HHI)	-0.015	0.009	-1.67	$p < 0.10$

Note: Firm-clustered robust standard errors are reported. Hausman test supports the Fixed Effects specification ($\chi^2 = 21.47$, $p < 0.01$). Mean VIF = 2.31. Heteroskedasticity and autocorrelation corrections were applied.

Model Statistics:

$$R^2 = 0.61$$

$$F\text{-statistic} = 18.72 \text{ (} p < 0.01 \text{)}$$

$$\text{Observations} = 1,250$$

D. Panel Diagnostics and Model Validation

Several diagnostic procedures were conducted to validate the panel regression estimates. First, the Hausman test confirmed the suitability of the Fixed Effects model relative to the Random Effects specification ($\chi^2 = 21.47$, $p < 0.01$). Second, multicollinearity diagnostics showed acceptable VIF values below the critical threshold, indicating limited linear dependence among explanatory variables.

Third, the Modified Wald test indicated the presence of heteroskedasticity, while the Wooldridge test suggested first-order autocorrelation in the panel structure. To address these issues, robust clustered standard errors were estimated at the firm level. In addition, the IV robustness model produced coefficients that were largely consistent with the baseline FE model, reinforcing the stability of the empirical relationships across estimation techniques.

E. Interpretation

The regression findings provide strong empirical support for all proposed hypotheses. First, H1 is supported, as incumbent capacity utilization exhibits a positive and statistically significant effect on entrant profitability ($\beta = 0.083$, $p < 0.01$). This indicates that when incumbents operate near full capacity, their limited ability to expand output reduces competitive pressure, thereby benefiting new entrants.

Second, H2 is supported, with incumbent excess capacity showing a negative and significant relationship with entrant profitability ($\beta = -0.067$, $p < 0.01$). This confirms that incumbents can strategically use surplus capacity to deter entry and suppress the performance of new firms.

Third, H3 is supported, as entrant capacity constraints have a negative and statistically significant impact on profitability ($\beta = -0.091$, $p < 0.01$). This finding suggests that limited production capacity restricts entrants' ability to scale operations and achieve cost efficiencies.

Fourth, H4 is supported, with the interaction term between incumbent capacity utilization and entrant capacity constraint being negative and significant. This implies that the advantages created by constrained incumbents are not fully realized when entrants themselves face capacity limitations.

Finally, H5 is supported, as market demand growth has a positive and significant effect on profitability ($\beta = 0.056$, $p < 0.01$), highlighting the role of favorable demand conditions in enhancing entrant performance.

F. Graphical Evidence

Figure 2 illustrates the relationship between incumbent capacity utilization and entrant profitability. The upward-sloping pattern indicates a positive association, where higher levels of incumbent capacity utilization correspond to increased profitability for new entrants. This trend suggests that as incumbents operate closer to their production limits, their ability to intensify competition diminishes, thereby creating more favorable conditions for entrants to achieve higher returns.

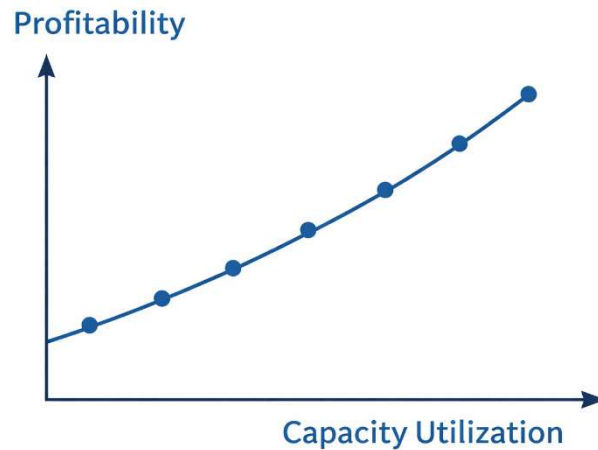


Figure 2. Effect of incumbent capacity utilization on entrant profitability

Figure 3 illustrates the interaction effect between incumbent capacity utilization and entrant capacity constraints on profitability. The graph presents two upward-sloping lines representing firms with high entrant capacity and low entrant capacity, respectively. While profitability increases with higher incumbent utilization in both cases, the slope is steeper for entrants with higher capacity.

The divergence between the two lines indicates that entrants with greater capacity are better able to capitalize on situations where incumbents are capacity-constrained. In contrast, entrants with limited capacity experience comparatively lower gains, even when incumbent utilization is high. This pattern highlights the importance of sufficient entrant capacity in fully exploiting favorable competitive conditions.

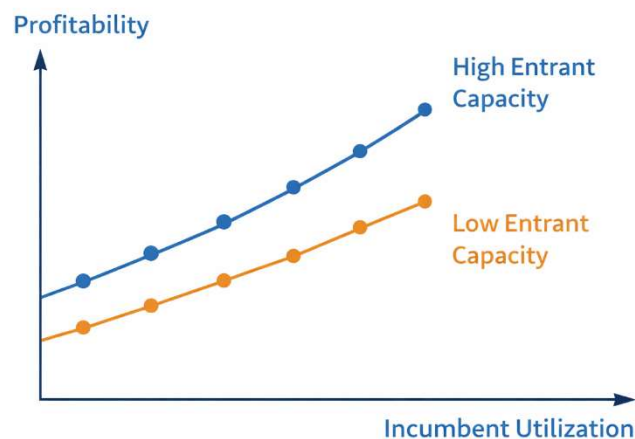


Figure 3. Interaction effect of capacity constraints

G. Robustness Checks

To ensure the reliability and stability of the findings, multiple robustness checks were conducted. First, the model was re-estimated using alternative profitability indicators, including Return on

Equity (ROE) and EBITDA margin, and the coefficients remained consistent in both sign and statistical significance. Second, Random Effects and Instrumental Variable specifications produced results broadly similar to the baseline Fixed Effects model, confirming the robustness of the estimated relationships.

Third, diagnostic tests confirmed the appropriateness of the panel estimation strategy. The Hausman test supported the use of the Fixed Effects model, while VIF statistics indicated no serious multicollinearity concerns. Heteroskedasticity and autocorrelation detected in the residual structure were corrected using firm-clustered robust standard errors.

Finally, sub-sample analyses across manufacturing, telecommunications, and energy industries revealed comparable coefficient patterns, indicating that the findings are not driven by sector-specific effects alone.

H. Findings

The empirical analysis confirms that capacity constraints are a key determinant of entrant profitability in oligopolistic markets. The results show that when incumbents operate under capacity constraints, they create favorable conditions that enable new entrants to achieve higher profitability. In contrast, the presence of excess capacity among incumbents serves as an effective strategic deterrent, limiting the success of entrants. Additionally, capacity limitations faced by entrants themselves significantly reduce their ability to exploit market opportunities and achieve optimal performance. The findings also indicate that market demand conditions play a moderating role, either amplifying or mitigating the effects of capacity constraints. Overall, the results strongly support the theoretical predictions and underscore the importance of capacity as a strategic variable in shaping competitive entry outcomes.

B. Discussion

The findings of this study offer a nuanced and theoretically consistent understanding of how capacity dynamics shape competitive outcomes in oligopolistic markets. At a broad level, the results reinforce the central argument in industrial organization theory that capacity is not simply a passive production constraint but an active strategic instrument used by firms to influence market structure, pricing behavior, and entry outcomes.

First, the positive and significant effect of incumbent capacity utilization on entrant profitability provides strong support for the notion that constrained incumbents are less capable of engaging in aggressive competitive responses. When incumbents operate near full capacity, their ability to increase output, cut prices, or flood the market in response to entry is limited. This creates a temporary “strategic window” that entrants can exploit. This finding aligns with classical entry-

deterrence theory, which suggests that firms with limited excess capacity cannot credibly threaten post-entry price wars. It also complements more recent empirical work emphasizing the importance of supply-side rigidity in shaping competitive dynamics. In this context, high utilization effectively reduces the intensity of rivalry, allowing entrants to establish themselves and achieve positive returns.

In contrast, the negative impact of incumbent excess capacity highlights the strategic role of idle resources in deterring entry and suppressing entrant performance. Excess capacity provides incumbents with the flexibility to rapidly expand output and engage in predatory or limit-pricing strategies when new firms enter the market. The empirical evidence suggests that even the presence of such capacity—irrespective of whether it is fully utilized—can influence entrant expectations and behavior. This supports the strategic commitment view of capacity, where maintaining surplus capacity serves as a credible threat that disciplines potential competitors. The findings therefore confirm that excess capacity acts as a barrier to entry not only structurally but also behaviorally, shaping both actual and perceived competitive intensity.

The strong negative effect of entrant capacity constraints further underscores the importance of internal capabilities in determining market success. Entrants with limited capacity are unable to fully exploit favorable market conditions, even when incumbents are constrained. This result is consistent with resource-based and capability-based perspectives, which emphasize that firm performance depends on the ability to deploy adequate resources efficiently. Limited capacity restricts scale economies, reduces bargaining power, and may lead to higher average costs, all of which undermine profitability. Importantly, these findings shift part of the analytical focus from external market structure to internal firm preparedness, suggesting that successful entry requires not only favorable external conditions but also sufficient internal capacity investment.

The interaction effect between incumbent capacity utilization and entrant capacity constraints provides one of the most insightful contributions of the study. The negative and significant coefficient indicates that the benefits of constrained incumbents are conditional on the entrant's own capacity position. In other words, favorable market conditions created by incumbent limitations do not automatically translate into higher profitability unless entrants possess the capability to respond effectively. This highlights the interdependent nature of competitive dynamics in oligopolistic markets. It also suggests that entry outcomes are shaped by a “double-sided constraint” mechanism, where both incumbent and entrant capacities jointly determine profitability. This finding adds depth to existing literature by moving beyond isolated effects and emphasizing the importance of interaction effects in strategic analysis.

The positive role of market demand growth further contextualizes these relationships by demonstrating how external conditions amplify or mitigate capacity effects. In periods of strong demand growth, the pressure on capacity increases across the industry, reducing the likelihood of aggressive competitive responses and expanding opportunities for entrants. Conversely, in low-growth or declining markets, even small amounts of excess capacity can intensify competition and erode profitability. This reinforces the idea that market demand acts as a critical moderating factor, influencing both the strategic behavior of incumbents and the performance of entrants. The empirical evidence thus supports a contingent view of competition, where the impact of capacity depends on broader economic conditions.

The control variables also provide meaningful insights. The positive association between firm size and profitability suggests that scale advantages remain important even for new entrants, possibly due to cost efficiencies, better access to capital, or stronger market positioning. The marginally negative effect of market concentration indicates that highly concentrated markets may pose additional challenges for entrants, potentially due to coordinated behavior among incumbents or higher entry barriers. Together, these findings highlight that while capacity is a central determinant, it operates within a broader ecosystem of structural and firm-level factors.

A. Managerial Implications

From a managerial perspective, the results carry several important implications. For potential entrants, the findings emphasize the need to carefully assess both incumbent capacity conditions and their own capacity readiness before entering a market. Entering when incumbents are operating at high utilization levels can provide a strategic advantage, but only if the entrant has sufficient capacity to capitalize on the opportunity. This suggests that capacity planning should be a core component of entry strategy. For incumbent firms, the results highlight the strategic value of maintaining excess capacity as a deterrent mechanism. However, this must be balanced against the costs of underutilized resources, indicating a trade-off between operational efficiency and strategic flexibility.

B. Policy Implications

From a policy perspective, the study raises important considerations regarding market competition and regulation. The use of excess capacity as a strategic barrier may limit competition and reduce market efficiency, particularly if it leads to sustained underutilization of resources. Regulators may need to consider how capacity-related strategies influence entry conditions and whether they contribute to anti-competitive behavior. At the same time, policies that facilitate capacity expansion for new entrants, such as improved access to financing or infrastructure, could enhance market contestability and promote more dynamic competition.

C. Limitations

Despite its contributions, the study has several limitations. First, the analysis depends on the availability and consistency of secondary panel data drawn from multiple commercial and industry sources, which may introduce measurement limitations in capacity-related variables. Although extensive data-cleaning and validation procedures were implemented, some industries lacked fully standardized reporting practices.

Second, while the fixed-effects and instrumental-variable approaches reduce endogeneity concerns, the study does not establish definitive causality because strategic capacity decisions and profitability may evolve simultaneously over time. Third, the dataset primarily covers selected oligopolistic industries and emerging-market firms, which may limit the broader generalizability of the findings to other institutional or competitive environments.

Finally, the use of aggregate industry demand measures may not fully capture segment-level competitive dynamics and localized market variations.

D. Future Research

Future research can build on this study in several directions. One promising avenue is the use of dynamic structural models to capture the evolution of capacity decisions and competitive interactions over time. Another extension could involve examining the role of technological change, which may alter capacity constraints by enabling more flexible or scalable production processes. Further research could also explore heterogeneity among entrants, such as differences between domestic and international firms, or between startups and diversified corporations. Finally, incorporating behavioral factors, such as managerial expectations and strategic signaling, could provide deeper insights into how capacity influences competitive decision-making.

V. CONCLUSION

This study examines the profitability of new entrants in capacity-constrained oligopolistic markets using a data-driven approach. The findings demonstrate that capacity conditions are central to shaping entry outcomes. High incumbent capacity utilization creates opportunities for entrants by limiting competitive responses, whereas excess capacity acts as a strategic deterrent that suppresses entrant profitability. Additionally, entrants' own capacity constraints significantly restrict their ability to exploit market opportunities. The results further show that profitability is influenced by the interaction between incumbent strategies, entrant capabilities, and market demand conditions, with favorable demand amplifying entry success. The study contributes to the literature by establishing capacity as a strategic variable in entry analysis, bridging theoretical and empirical perspectives. It also offers practical insights for firms regarding entry timing, capacity

investment, and competitive positioning, while highlighting policy implications related to market competition. Despite limitations such as data constraints and static modeling, the research provides a foundation for future work on dynamic and technology-driven capacity strategies. However, the findings should be interpreted within the scope and quality limitations of the panel dataset and the selected industries included in the analysis. Overall, the study underscores that capacity dynamics are critical for understanding and managing entry in oligopolistic markets.

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