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Banking Competition On Investment Efficiency of Non Financial Companies in Indonesia

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ABSTRACT

The structure of the banking market influences corporate investment efficiency through credit allocation, where the level of banking competition determines the quality of credit screening and capital allocation. This study aims to examine the impact of banking competition on the investment efficiency of non-financial firms listed on the Indonesia Stock Exchange during the 2013–2023 period. The banking market structure is measured using three key indicators: Top 3 Bank Assets (TOP), the Herfindahl-Hirschman Index (HHI), and the Lerner Index. Data is processed using the Generalized Method of Moments (GMM) with a two-step system estimation and robust standard errors. Additionally, diagnostic tests (AR(1), AR(2), Sargan-Hansen) and robustness checks were conducted by removing dummy control variables. The results show that the TOP and HHI indicators have significantly negative coefficients on investment efficiency, indicating that a more concentrated banking market leads to more efficient corporate investment allocation. Although the Lerner Index also shows a negative coefficient, its influence is relatively weak in supporting the alternative hypothesis. These findings suggest that a more centralized banking structure can enhance credit monitoring mechanisms and improve investment efficiency in Indonesia.

Keywords **:** Investment Efficiency, Banking Competition, TOP, HHI, Lerner, GMM

INTRODUCTION

The banking sector constitutes one of the most critical components of the global economy. Competition within this sector not only affects macroeconomic dynamics but also contributes to overall economic growth (Levine et al., 2000). At the firm level, banking competition influences corporate behavior, particularly in terms of investment efficiency. In Indonesia, the intensity of competition among banks plays a significant role in resource allocation by affecting companies' cost of capital and, consequently, their investment decisions (Degryse & Ongena, 2005). Heightened competition often leads to lower lending rates, thereby facilitating firms' access to affordable credit for funding investment projects. This dynamic benefits firms through reduced borrowing costs and greater lending activity (Leon, 2015; Wang et al., 2020), which in turn stimulates more active engagement in profitable ventures.

Nevertheless, banking competition also introduces potential challenges related to agency problems and corporate governance (Si et al., 2023). For instance, managers may overstate investment returns in financial reports, leading to overinvestment or inefficient capital allocation

(Biddle et al., 2009). Given these contrasting perspectives, researchers seek to adopt an empirical approach to clarify the relationship between banking competition and corporate investment efficiency.

Importantly, prior studies indicate that the impact of banking competition is not universally positive. Claessens and Laeven (2005) argue that while intense competition reduces financing costs, it may also erode bank profitability and weaken incentives to rigorously evaluate investment projects, thus heightening the risk of inefficient investments. Moreover, external factors such as government regulation and economic stability further shape this relationship. Laeven and Levine (2007) emphasize that a regulatory framework supportive of banking competition is essential to ensure efficient capital allocation. In the Indonesian context, government supervision and regulation of the banking sector will be decisive in determining whether competition enhances investment efficiency. Appropriate regulation can prevent excessive risk-taking while safeguarding efficient access to financing.

Building on this body of research, the present study aims to investigate the actual effect of banking competition on the efficiency of corporate investments in Indonesia. Specifically, the study examines whether competition within the banking sector improves or undermines the efficiency of investments undertaken by non-financial firms. Utilizing historical financial data from publicly listed companies in Indonesia, this research seeks to provide empirical evidence on this issue.

LITERATURE REVIEW

Market concentration plays a critical role in shaping competition and regulatory frameworks. Stigler (1950) argued that a high concentration ratio reflects limited competition, enabling firms to raise prices above normal levels. This implies that when only a few firms dominate the market, they may collude or make decisions detrimental to consumers. Hence, examining market concentration is essential to understand competitive dynamics and their implications for the broader economy. Two widely used measures to assess market concentration are the Concentration Ratio (CR) and the Herfindahl-Hirschman Index (HHI).

The key distinction between CR and HHI lies in their measurement approaches and analytical depth. The Concentration Ratio, often expressed as CR4 or CR8, aggregates the market share of the four or eight largest firms, offering a straightforward depiction of industry dominance. Conversely, the HHI squares the market shares of all firms, giving disproportionate weight to larger firms and producing a more nuanced measure of concentration. Bikker and Haaf (2002) highlight that the HHI is more responsive to the distribution of market shares, making it a stronger indicator of market concentration than CR. Consequently, the HHI provides a more accurate reflection of competition in complex markets, where high concentration can create barriers to entry for smaller firms.

Underinvestment refers to a condition in which a firm does not allocate adequate resources to acquire a project or asset, despite the potential for substantial economic value or benefits. Myers (1977) explains that underinvestment frequently arises when firms face financing constraints, leading them to abandon projects with positive net present value (NPV) either due to limited capital availability or in an effort to avoid additional risk. This problem is often aggravated by high capital costs or restrictive debt structures that reduce investment flexibility. Greenwald, Stiglitz, and Weiss (1984) argue that underinvestment typically reduces productivity, which in turn diminishes profitability. Over the long term, such inefficiencies can negatively affect firm valuation and reduce attractiveness to investors. Giroud and Mueller (2010) further highlight that in concentrated markets, large firms with stronger market power are able to undertake larger investments, though they may also fall into overinvestment because of reduced competitive discipline. In contrast, firms in highly competitive markets often hesitate to commit to substantial investments due to elevated competitive risks, which can reinforce underinvestment tendencies.

Overinvestment, on the other hand, occurs when firms allocate excessive resources to projects that yield returns below the cost of capital or generate negative NPVs. Stulz (1990) demonstrates that overinvestment harms shareholders by misallocating funds, thereby reducing profitability and weakening stock performance. Moreover, firms that persist in overinvestment without proper oversight often experience declining firm value over time, as inefficient investment decisions exacerbate operational weaknesses.

Marginal cost plays a central role in the calculation of the Lerner Index, as it represents the additional cost incurred in producing one more unit of output. The Lerner Index itself measures a firm's ability to set prices above marginal cost, thereby reflecting its market power. Degryse and De Jong (2006) emphasize that marginal cost is a vital component because it indicates cost efficiency, which directly influences a firm's capacity to generate profits. Put differently, the wider the gap between price and marginal cost, the greater the firm's monopoly power.

Marginal cost also signifies production efficiency, making it essential in evaluating the Lerner Index. Sutton (1991) notes that firms capable of lowering their marginal costs are better positioned to dominate markets by charging prices substantially above production costs. Such pricing power allows firms not only to reduce competition but also to deter potential entrants, underscoring the extent of their monopolistic advantage. The link between the Lerner Index and market concentration is particularly evident when large firms in highly concentrated markets sustain high price levels relative to marginal costs (Bain, 1951).

In the context of banking, competition can positively influence corporate investment. Increased competition among banks enables firms to secure easier access to credit, as banks tend to ease borrowing restrictions or relax credit requirements (Khan & Kutan, 2023; Leon, 2015). This facilitates greater investment activity by firms, encouraging banks to continue lending and thereby supporting further investment. In highly competitive banking environments, firms are less prone to underinvestment, as access to financing becomes more attainable. At the same time, competition pushes banks to improve asset quality through more rigorous credit screening and monitoring (Diamond, 1984; Goetz, 2018). As a result, firms inclined toward overinvestment are

compelled to scale back inefficient projects, which enhances overall investment efficiency. Based on this reasoning, the following hypothesis is proposed:

H1: Banking competition enhances corporate investment efficiency.

METHODOLOGY

Peneliti menggunakan data sekunder yang bersumber dari S&P Capital IQ. Peneliti mengumpulkan data keuangan perusahaan non-keuangan dan data bank komersial dalam jangka waktu dari tahun 2013 sampai dengan 2023. Data yang digunakan mencakup informasi dalam laporan keuangan yang menjadi variabel penelitian ini.

$$investeffi_{i,t} = \gamma 0 + \gamma 1 \times invest_{i,t-1} + \gamma 2 \times growth_{i,t-1} + \gamma 3 \times cash_{i,t-1} + \gamma 4 \times debt_{i,t-1} + \gamma 5 \times size_{i,t-1} + \gamma 6 \times yearlist_{i,t-1} + \gamma 7 \times return_{i,t-1} + \alpha_t + \alpha_j + \varepsilon_{i,t}$$

Table 3.1 Definition Operational Variables

Variable	Definition Operational
invest	$\frac{(T_t + It_t + CIP_t) - (T_{t-1} + It_{t-1} + CIP_{t-1})}{Total\ assets_t}$
growth	$\frac{Market\ Capitalization\ +\ Net\ Debt}{Book\ Value\ of\ Total\ Assets}$
cash	$\frac{Cash\ and\ cash\ equivalent}{Total\ assets}$
debt	$\frac{Bank\ debt}{Total\ assets}$
size	$ln\ ln\ (total\ assets)$
yearlist	ln(*listing years*)
return	$\frac{Net\ income}{Total\ assets}$

Source : Hyunh (2024)

Banking market concentration serves as an independent variable, reflecting the degree of interbank competition that may influence corporate investment efficiency. To assess market concentration, researchers employ three primary indicators: the Top 3 Bank Assets (TOP), the Herfindahl-Hirschman Index (HHI) concentration ratio, and the Lerner Index. The TOP indicator measures the proportion of assets held by the three largest banks relative to the total assets of all commercial banks within a country. In the case of Indonesia, this is calculated by summing the assets of the three largest banks—BCA, Mandiri, and BRI—and dividing the total by the annual aggregate assets of all commercial banks. The formula for the TOP ratio is expressed as follows:

$$TOP = \frac{Top\ 3\ largest\ bank\ assets}{All\ bank\ assets}$$

` The HHI-based concentration ratio is an indicator used to evaluate the degree of market concentration and the distribution of market power. A higher ratio reflects stronger market

concentration and lower levels of competition. The formula for calculating the HHI ratio is as follows:

$$HHI = Total \left(\frac{Market\ cap\ (banks)}{Total\ market\ cap\ (banks)\ in\ a\ year}\right)^2$$

The Lerner Index is commonly employed to evaluate a bank's market power within the banking sector, and it is defined by the following formula:

$$Lerner_{it} = \frac{Pit - Mit}{Pit}$$

Then, the marginal cost is calculated through the regression function as follows:

$$MC_{TA_{it}} = \frac{Cost_{it}}{Q_{it}}\left[\beta_1 + \beta_2 \ln Q_{it} + \sum_{k=1}^{3} \phi_k \ln W_{k,it}\right]$$

RESULTS

Table 4.1 Descriptive Statistics

Variabel	Mean	STD	Min	Max
investeffi	0.0152	0.0236	0.0001	0.1347
Lerner	-2.9708	1.2009	-6.4315	-1.7769
TOP	0.5100	0.0164	0.4799	0.5364
HHI	0.4561	0.3564	0.1637	0.9429
size	14.3091	1.9161	4.9143	19.9144
roa	0.0284	0.1857	-3.9211	7.8086
cash	0.0974	0.1177	0	1
debt	0.2113	0.2675	0	5.8771
tobinQ	0.1822	0.4091	-1	5.8414
yearlist	1.5911	0.7104	0	2.3978
state	0.1474	0.1205	0	1
fide	32.7161	0.4100	31.9411	33.2467
gdp	4.3390	2.0728	-2.0655	5.5572

Source : Data Processing (2025)

Table 4.2 GMM Regression Result

	TOP	HHI	Lerner
top	0.284***		
	(0.101)		
hhi		0.016***	
		(0.005)	

lerner			-0.029***
			(0.011)
size	0.000	0.001	0.001
	(0.000)	(0.001)	(0.001)
roa	−0.000	0.011	0.002
	(0.008)	(0.009)	(0.005)
cash	−0.030	0.053***	0.036***
	(0.021)	(0.017)	(0.013)
debt	-0.017	0.016	0.012
	(0.012)	(0.014)	(0.009)
tobinq	0.001	0.001	-0.003
	(0.008)	(0.009)	(0.005)
yearlist	0.003	-0.010***	0.021**
	(0.002)	(0.004)	(0.008)
state	-0.009	0.001	0.008
	(0.006)	(0.001)	(0.008)
fide	0.005	-0.005**	0.014***
	(0.004)	(0.002)	(0.005)
gdp	0.001**	-0.002***	0.017***
	(0.005)	(0.008)	(0.007)
lagged investeffi	1.636***	0.079	0.130**
	(0.317)	(0.075)	(0.062)
Observations	3,625	3,625	3,625
Groups	671	671	671
AR(1) test	0.001	0.000	0.000
AR(2) test	0.485	0.513	0.715
Sargan test	0.670	0.169	0.051
Hansen test	0.709	0.842	0.287
P>|t|	0.005	0.003	0.010

***** p < 0.1 ** p < 0.05 * p < 0.01**

Source: Data Processing (2025)

Tabel 4.3. Result Interpretation

BANKING CONCENTRATION		***INEFFICIENCY***	***EFFICIENCY***
TOP	Increase 1 poin (↑)	Increase 0.284 poin (↑)	Decrease (↓)
HHI	Increase 1 poin (↑)	Increase 0.016 poin (↑)	Decrease (↓)
LERNER	Increase 1 poin (↑)	Decrease 0.029 poin (↓)	Increase (↑)

Source: Data Processing (2025)

Referring to Tables 4.2 and 4.3, the TOP variable shows a significant positive coefficient, suggesting that higher banking market concentration among the three largest banks significantly influences investment efficiency, both by increasing and reducing it. Meanwhile, the HHI variable records a coefficient of 0.016 with a p-value of 0.003 (<0.01), indicating that greater market concentration is associated with higher investment efficiency, though it simultaneously reflects a decline in efficiency. These findings are consistent with hypothesis H1.

In contrast, the Lerner index yields a negative coefficient of -0.029 with a p-value of 0.010, contradicting the results of TOP and HHI. The Lerner measure suggests that as banking market power increases (signaling weaker competition), investment efficiency actually declines (or, paradoxically, improves). This result contradict with H1, and this different directions of these results highlight that the impact of banking competition on the investment efficiency of non-financial firms in Indonesia depends on the measurement indicator applied.

The study employs a two-step Generalized Method of Moments (GMM) approach, a dynamic panel estimation technique effective in mitigating issues of endogeneity, heteroscedasticity, and unobserved individual effects in panel data. This method ensures efficient and consistent parameter estimates even when independent variables are correlated with the error term. The use of a two-step GMM system with robust standard errors further improves the accuracy of estimation, while the Hansen and Arellano-Bond tests confirm that the model is free from second-order autocorrelation and instrument overidentification. This methodological framework is consistent with the recommendations of Arellano and Bover (1995) and Blundell and Bond (1998) for dynamic panel data analysis.

Tabel 4.4. Interpretation GMM Result

Banking Concentration	**Banking Competition**	***Inefficiency***	**Investment Efficiency**
Increase (↑)	Decrease (↓)	Increase (↑)	Decrease (↓)
Decrease (↓)	Increase (↑)	Decrease (↓)	Increase (↑)

Source: Data Processing (2025)

This study presents mixed findings on the impact of banking competition on the investment efficiency of non-financial firms in Indonesia. Greater market concentration (as reflected by higher HHI and TOP values), which indicates weaker competition, is associated with higher investment inefficiency. In contrast, the Lerner Index suggests that increased bank market power (lower competition) reduces investment inefficiency, thereby improving investment efficiency. Degryse and De Jong (2006) argue that banks operating in more concentrated markets tend to adopt more prudent lending practices, which helps prevent risky investments. Consequently, banking competition appears to enhance the investment efficiency of non-financial firms in Indonesia.

Beyond banking market structure, the results also highlight the significant role of firm characteristics. Firm size (a proxy for organizational strength) exerts a positive influence on investment efficiency. Larger firms typically benefit from stronger access to external financing, more effective management practices, and better corporate governance, allowing them to allocate capital more selectively and efficiently. Supporting this, Chen, Guo, and Mande (2013) found that large firms are less prone to overinvestment due to tighter monitoring by capital markets and regulatory bodies.

The cash variable also demonstrates a significant effect on investment efficiency. Firms with higher cash reserves enjoy greater financial flexibility, enabling them to fund investments without depending on external capital. With sound governance, these firms are able to avoid overinvestment in unproductive projects (Jensen, 1986). Similarly, the year-listing variable, which is significantly associated with efficiency, indicates that firms with longer listing histories are more accustomed to market discipline. Breuer, Muller, Rosenbach, and Salzmann (2018) emphasize that corporate reputation and extended market experience strengthen managerial discipline, enhance internal control systems, and encourage more strategic and productive investment decisions.

In addition, financial development (fide) significantly improves investment efficiency. A more advanced financial system increases firms' access to external financing, thereby supporting efficient investment (Levine, 2005; Beck, Levine, & Loayza, 2000). Macroeconomic conditions, proxied by GDP, also play an important role. Higher GDP growth encourages firms to invest more efficiently by generating greater investment demand and new market opportunities. This economic expansion allows firms to be more selective in project choice and to optimize the allocation of resources (Barro, 1991).

Conclusion

This study investigates the impact of banking competition—measured through market structure indicators such as TOP, HHI, and the Lerner Index—on the investment efficiency of non-financial firms listed on the Indonesia Stock Exchange over the 2013–2023 period. The analysis employs the Generalized Method of Moments (GMM) to ensure model validity, with additional robustness checks conducted by excluding dummy control variables, including industry-fixed effects and state ownership. The dataset comprises 678 firms with a total of 3,625 observations.The findings consistently indicate that lower market concentration, or greater banking competition, enhances corporate investment efficiency. Accordingly, higher levels of banking competition are shown to improve the investment efficiency of non-financial firms in Indonesia, supporting the study's hypothesis.

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