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Intercorporate loans and tunneling under uncertainty: Empirical evidence from Indonesia

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Abstract

Intercorporate loans are often used in business groups, especially those with pyramidal ownership structure, which is a characteristic common among Indonesian companies. Intercorporate loans in business groups can be beneficial but also presents a number of risks on agency issues, such as in acquisition of rights of minority shareholders by tunneling. This study aimed to identify the factors influencing tunneling through intercorporate loans in public companies in Indonesia. The study was conducted on companies listed on the Indonesia Stock Exchange, excluding banks and financial institutions. A period of uncertainty was observed during the global financial crisis period of 2008. The data were analysed using logistic regression analysis. The results are as follows: A pyramidal ownership structure, family ultimate controller, and foreign ultimate controller had positive influence on intercorporate loans tunneling.

Introduction

Intercorporate loans are loans and guarantees provided by one company to another, generally affiliated with a business group, but sometimes to companies that are not part of the group (Naskar & Vaidya, 2019). Intercorporate loans are often performed in business groups in East Asian countries. For example, when external capital market doesn't grow well, internal capital market (such as intercorporate loans) is business groups can be an alternative source of funding reducing the information assymetry issue between managers and external investors (Abigail & Dharmastuti, 2022; Ghose et al., 2025; Huang, 2019; Kushwaha & Dixit, 2024; Naskar & Vaidya, 2019). Intercorporate loans can improve loan efficiency in several ways. Loan providers have more information on related borrowers within business groups than on unrelated parties, and this information can be used to determine the risk characteristics of investment projects, or to force borrowers to abandon bad investment projects at an early stage. Intercorporate loans can be performed by related parties due to the close relationship between lenders and borrowers, thereby improving efficiency. Credit monitoring by internal parties can reduce asymmetry risk compared to extending credit to outsiders. Therefore, loans to related parties are more beneficial for lenders and borrowers alike because they reduce information asymmetry and increase incentives (Ghose et al., 2025; Kushwaha & Dixit, 2024).

Intercorporate loans are often used within business groups and are efficient transactions because they reduce information asymmetry and increase incentives between companies within the group (Kushwaha & Dixit, 2024). However, intercorporate loans can be exploited by the controlling majority shareholder, who possesses more information than minority shareholders. This practice is known as 'tunnelling' and results in losses (expropriation) for minority shareholders (Solarino & Boyd, 2020). Intercorporate loans have several benefits as well as large risk on agency issues, such as acquisition of rights of minority shareholders (expropriation) by tunneling (Naskar & Vaidya, 2019). Tunneling involves the controlling shareholder diverting company resources from the company's profits for their own advantage (Solarino & Boyd, 2020; Wulandari & Setiawan, 2023). In tunneling, majority shareholders tend to increase their own welfare by acquitting, enjoying

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private benefits from their control and harming minority stakeholders (Ma et al., 2023; Sari & Baridwan, 2014; Solarino & Boyd, 2020; Wulandari & Setiawan, 2023). Evidence of tunneling in business groups has been found in various countries, whether developed or developing countries. Tunneling can have an impact on financial distress (He et al., 2021; Naskar & Vaidya, 2019), negatively impact financial performance (Batubara & Supatmi, 2022; Gamasti & Supatmi, 2023) and market performance (Abigail & Dharmastuti, 2022; Gamasti & Supatmi, 2023). Tunneling potentially happens in public companies in Indonesia because Indonesian public companies are generally business groups which adopt pyramidal ownership structure (Wulandari & Setiawan, 2023).

A pyramidal ownership structure is a multi-layered system of ownership in which a controlling entity (usually a family, government or group) holds sway over a network of companies (Aguilera et al., 2025). This structure enables the controlling entity to exercise control over a company despite owning a smaller proportion of its shares (Aguilera et al., 2025; Budiyanti et al., 2018; Chandera, 2025; Lin & Yeh, 2020; Mindzak & Zeng, 2018; Mindzak, 2019).The pyramidal ownership structure enables the owners to perform "tunneling" which is transferring resources from companies whose stocks are partially owned by the public to other companies (whether those whose stocks aren't sold for the public or sold for the public). The resources can be moved to another section within a pyramidal structure as desired by controlling shareholders in a business group. Pyramidal ownership structure enables a controlling owner to have high control rights, but low cash flow rights, so tunneling will have small impact on controlling shareholders (Solarino & Boyd, 2020).

Empirical evidence related to tunneling activities (Batubara & Supatmi, 2022; Bian & Kuo, 2023; He & Xu, 2020; Mandell, 2021; Solarino & Boyd, 2020; Wulandari & Setiawan, 2023) and its impacts (Abigail & Dharmastuti, 2022; Batubara & Supatmi, 2022; Gamasti & Supatmi, 2023; He et al., 2021; Naskar & Vaidya, 2019) have been presented by several studies. Empirical literature has explained related loan tunneling and its influencing factors (Solarino & Boyd, 2020; Wulandari & Setiawan, 2023). However, research gaps remain.

1. Firstly, previous studies have identified the impact of ownership concentration and foreign ownership on the tunneling of related-party loans in Indonesia (Wulandari & Setiawan, 2023). However, these studies did not distinguish between control and ownership in the context of pyramidal ownership, a prevalent ownership structure among Indonesian business groups. It is important to include pyramidal ownership because controlling shareholders who have substantial control rights but limited cash flow rights over the companies they control are incentivised to expropriate through tunnelling. However, controlling shareholders whose cash flow ownership aligns with their control rights will act against their own self-interest. This encourages the principal owner to reduce or refrain from expropriation (Aguilera et al., 2025; Lin & Yeh, 2020).
2. Secondly, previous studies (Solarino & Boyd, 2020; Wulandari & Setiawan, 2023) measured foreign ownership based on ownership concentration (direct cash flow rights). Ownership concentration differs from control (ultimate foreign controller). Foreign investors with a high degree of control incentivise shareholders to acquire company resources, particularly during unstable macroeconomic conditions.
3. Thirdly, previous studies (Wulandari & Setiawan, 2023) did not consider institutional ownership. Institutional investors with minority shareholdings strive to defend their rights in the event of expropriation, which can lead to more transparent governance. They are generally straightforward, unsophisticated individual investors who are unaccustomed to analysing the detailed situations and conditions of their business sectors. Non-controlling institutional ownership (e.g. by insurance companies, banks, investment firms, and other institutions) is expected to be more effective in encouraging increased oversight of management performance.

This motivated researchers to conduct further research focusing on related-loan tunneling in Indonesian business groups, taking into account the variables of pyramidal ownership structure (where cash flow rights and control are separated) and foreign ultimate control. Despite the

implementation of several corporate governance measures, weaknesses in the regulatory framework still facilitate the potential for related-loan tunnelling. This study therefore aims to examine the factors influencing tunneling through intercorporate loans in public companies in Indonesia. The research questions (RQs) can be formulated as follows:
RQ1. Does ownership structure influence intercorporate loan tunneling?
RQ2. Does governance influence intercorporate loan tunneling?

Literature Review and Hypotheses Development

According to agency theory (Khandelwal et al., 2023), there are two agency issues in corporate governance. The first is agency conflict which emerges from principal-agent conflict (agency issue I). The second is agency conflict which emerges from conflict of interest between principals (agency issue II). The main agency issue isn't only agency issue between shareholders (principal) and managers (agent), but also between minority shareholders and controlling shareholders. Agency issue II, majority shareholders and minority shareholders, can emerge due to resources transfer between companies which mainly causes loss in minority shareholders (Khandelwal et al., 2023; Solarino & Boyd, 2020; Supatmi et al., 2019). The actions are defined as propping and tunneling (Aguilera et al., 2025; Solarino & Boyd, 2020). The term of propping is usually performed by controlling shareholder to support the company in financial difficulty/bankruptcy, increasing efficiency by reducing information asymmetry between creditors and debtors. Tunneling is related to the efforts of controlling shareholders of a parent company to exploit minority shareholders by syphoning economic resources of the company (Aguilera et al., 2025).

In the context of business groups, tunneling occurs when controlling shareholders transfer assets or profits between companies within the business group to the detriment of minority shareholders (Bian & Kuo, 2023; Mandell, 2021; Wulandari & Setiawan, 2023). Such practices include: price manipulation of goods or services exchanged, selling assets below market value (Solarino & Boyd, 2020), excessive executive compensation (Bian & Kuo, 2023; Sari & Baridwan, 2014; Solarino & Boyd, 2020), large loans granted without expectation of repayment (He & Xu, 2020; Solarino & Boyd, 2020), and collateral for loans taken by controlling shareholders or their related entities (Zhang et al., 2020), which can potentially pose financial risks to the company. Tunneling can impact financial distress (He et al., 2021), and company performance and value (Mandell, 2021). Existing literature (Lin & Yeh, 2020; Naskar & Vaidya, 2019) provides evidence of internal capital markets among group companies, which aim to support weaker group members financially. During times of crisis or uncertainty, external capital markets are difficult to access. In such situations, larger companies with higher profits and tangible assets provide group loans to other companies with lower profitability, higher leverage and fewer tangible assets. When a company within a business group experiences financial constraints, other group members provide loans to mitigate the impact on the business group (Kabbach-de-castro et al., 2022). However, internal capital markets can pave the way for tunneling and inefficiencies that are detrimental to minority shareholders (Qian et al., 2019). Tunneling is generally influenced by ownership structure and governance (Aguilera et al., 2025).

The Influence of Ownership Structure on Intercorporate Loans Tunneling

The tunneling of intercorporate loans can be primarily influenced by pyramidal ownership structures within business groups (Oh & Choi, 2025). Such a structure involves the indirect ownership of a company through another company, whether public or private (Lin & Yeh, 2020). Pyramidal ownership structure enables an owner to have small cash flow (usually identical with the portion of invested capital) can have large control right (Mandell, 2021). The condition allows controlling shareholders to transfer their wealth, or get special benefits through transactions between controlling shareholders and the controlled companies, but has small impact on the controlling shareholders (Solarino & Boyd, 2020).

Previous studies (Naskar & Vaidya, 2019; Sari & Baridwan, 2014; Solarino & Boyd, 2020; Wulandari & Setiawan, 2023) discover that there are many ways controlling shareholders transfer

significant proportion of resources from a company where the controlling shareholders have small cash flow rights to another company where they have large cash flow rights. Using pyramidal, controlling owners can control several public companies which have many minority shareholders, and: (a) can transfer resources out of companies in a business group; (b) purchase goods from companies in the business group with prices below market prices; (c) sell company assets from themselves or related parties under market prices; or (d) transfer the most beneficial portion of resources from a company to another company in the business group (Solarino & Boyd, 2020).

In a small company, if the company owner is a single founder or family, then there is no agency issue. When the company grows, the company registers to capital market and sells its stocks to the public to increase capital from outside of the family (Wulandari & Setiawan, 2023). In that condition, there are owners from outside of the family and agency issues start to occur. Founders and family owners exert significant informal control over the organisation's operations. Founders play a significant role in decision-making processes and are associated with equity financing, radical corporate strategy and firm performance (Lyu & Chen, 2022). Family control can mitigate agency problems by aligning ownership with management. However, it can also increase the likelihood of expropriation by non-family minority shareholders. Owner-centric corporate control enables insiders to exert greater control over the company, but also creates opportunities for them to appropriate wealth from other shareholders. Family controllers transfer a significant proportion of a company's free cash flow to another company where they have substantial cash flow rights and control, despite having few cash flow rights in the original company.

Foreign ownership can be viewed as an effective mechanism which can complete today's governance structure to prevent managements from maximizing private benefits (Wulandari & Setiawan, 2023). The presence of foreign investors in developing countries can encourage more open governance and accelerate reforms. Those coming from institutional environments in developed countries can encourage transparent governance practices in developing countries. They are also more resilient to emerging local issues (Ghose et al., 2025; Wulandari & Setiawan, 2023). Share ownership by foreign investors (who do not control the company) improves good governance; however, when foreign investors do control the company, it creates incentives for tunneling activities (Wulandari & Setiawan, 2023). The hypotheses in this study are formulated below.

H_{1a}: Pyramidal ownership structure has positive influence on tunneling through intercorporate loans.

H_{1b}: Family ultimate controller has positive influence on tunneling through intercorporate loans.

H_{1c}: Foreign ultimate controller has positive influence on tunneling through intercorporate loans.

The Influence of Corporate Governance on Tunneling through Intercorporate Loans

The ownership of independent commissioners and non-controlling institutions is some of the governance mechanisms which potentially control Intercorporate loans tunneling beside regulation factor (Abigail & Dharmastuti, 2022). Studies by (Solarino & Boyd, 2020) emphasize the importance of the independence of boards of companies to provide effective monitoring on acquisition activities such as tunneling. The independence of boards of commissioners of companies is required to protect investors' interests. Effective activities of boards of commissioners of companies prevent abuse of power by managers and company controllers. However, other studies (Huang, 2019) find that the independence of board of commissioners isn't effective in controlling tunneling.

Institutional ownership is shareholding by government, financial institutions, incorporated institutions, foreign institutions, trust fund and other institutions at year end (Solarino & Boyd, 2020). There are two theoretical approaches which can be used to explain the influence of institutional ownership on itercorporate loans tunneling (Kushwaha & Dixit, 2024). First, the efficient monitoring hypothesis approach which states that individual investors or insiders with low shareholding (minority) tend to utilize or borrow the voting power on majority institutional shareholders to monitor management performance. The second approach is the conflict of interest hypothesis. Unlike the first hypothesis, this hypothesis state that majority institutional investors

tend to compromise or side with the managements and ignore the interests of minority shareholders. (Kushwaha & Dixit, 2024) argue that the bigger the shareholding by non-controlling institutions, the more effective the control mechanism on management performance.

The hypotheses in this study are formulated below.

H_{2a}: The proportion of independent commissioners has negative influence on tunneling through intercorporate loans.

H_{2b}: Non-controlling institutional ownership has negative influence on tunneling through intercorporate loans.

Research Methods

This study used secondary data from available data of company group structure in companies' annual report, companies' financial statements, issuer profiles, company websites and companies' prospectus reports. Data of ultimate controllers in business group was obtained from top 100 business groups in Indonesia with the largest total income in 2012 available in Globe Asia magazine. The top 100 largest business groups in Indonesia make a significant contribution to the nation's economy, impacting GDP, employment and various sectors. The company samples in this study were 108 companies or 648 data for 2007-2012, collected by purposive sampling using several stages.

This study used measurement of tunneling through intercorporate loans which is the difference between related party other payables and related party other receivables (RPT, related party transaction) and total asset (He et al., 2021; Huang, 2019; Solarino & Boyd, 2020; Wulandari & Setiawan, 2023). Other receivables (ORTA, other receivable per total assets) were measured from lending to related parties by releasing receivables. Other payables (OPTA, other payable per total assets) were measured from borrowing from related parties by releasing payables. Pyramidal ownership structure was measured from the difference between control rights and cash flow rights. Family and foreign ultimate controllers were obtained from the data of top 100 business groups in Indonesia in Globe Asia magazine. The proportion of non-controlling institutional ownership was measured from total shares owned by non-controlling institutions divided by total shares. Independent commissioner was measured from the proportion of commissioners not affiliated with controlling owners to total boards of commissioners.

The research was conducted during the period of uncertainty surrounding the 2008 global financial crisis, covering the years 2007–2012. Uncertainty is characterized by a lack of information and knowledge in decision-making (Hilbert & Darmon, 2020; Temouri et al., 2020). During a crisis, uncertainty increases, external capital markets are underdeveloped, and companies are encouraged to use internal capital markets (such as through related party loans) within their business groups as an alternative funding source to mitigate information asymmetry. Financial crisis was a dummy/binary (distinguishing) variable which differentiated crisis and non-crisis periods. The crisis periods in this study were global financial crises in 2008 and 2009 and were coded as 1, while the periods before the crises (2007) and after the crises (2010-2012) was called normal period and were coded as 0.

Table 1. Variable and Measurement

Variable	Measurement	Sources
Intercorporate loans tunneling	Difference between related party other payables and related party other receivables	(He & Xu, 2020; Huang, 2019; Solarino & Boyd, 2020; Wulandari & Setiawan, 2023)
Ownership Structure		
Pyramidal structure	Difference between control rights and cash flow rights (CFRL) = CR-CFR Control rights (CR) = Direct cash flow rights + Indirect cash flow rights	(Jiang et al., 2010; Oh & Choi, 2025)

Variable	Measurement	Sources
	Direct cash flow rights = % ownership on the behalf of oneself Indirect cash flow rights = Total minimum ownership in every ownership chain Cash flow rights (CFR) = Direct control rights + Indirect control rights Direct control rights = Percentage of ownership on the behalf of oneself Indirect control rights = Multiplication of % ownership in every ownership chain	
Family ultimate controller	Dummy (1 = family ultimate controller owner, 0 = others). Data of family ultimate controller was obtained from top 100 business groups in Indonesia with the highest total income in 2012 from Globe Asia magazine.	(Lin & Yeh, 2020)
Foreign ultimate controller	Dummy (1 = foreign ultimate controller owner, 0 = others). Data of foreign ultimate controller was obtained from top 100 business groups in Indonesia with the highest total income in 2012 from Globe Asia magazine.	(Lin & Yeh, 2020)
Corporate Governance		
Independent commissioner	$\frac{\text{Unaffiliated commissioners}}{\text{Total boards of commissioners}} \times 100\%$	(Bian & Kuo, 2023; Huang, 2019)
Non-controlling institutional ownership	$\frac{\text{Shares of non} - \text{controlling institutions}}{\text{Non} - \text{controlling total shares}} \times 100\%$	(Bian & Kuo, 2023; Huang, 2019)
Control Variable		
Size	Size= Total asset logarithm	(Bian & Kuo, 2023; Solarino & Boyd, 2020; Wulandari & Setiawan, 2023)
Leverage	$\frac{\text{Total liabilities}}{\text{Total assets}} \times 100\%$	(Bian & Kuo, 2023; Solarino & Boyd, 2020; Wulandari & Setiawan, 2023)
Tobins'q	$\frac{\text{Stock market value} + \text{debt market value}}{\text{Total capital}}$	(Tarighi et al., 2022)
Industry	Dummy industry was based on data of industry code in Indonesia Capital Market Directory (ICMD)	(He et al., 2021)
Free cash flow	$\frac{\text{Operational cash flow} - \text{Net capital expanse} - \text{Net loan}}{\text{Total Asset}}$	(Bian & Kuo, 2023)
Crises	Dummy (1= global financial crises 2008 and 2009, 0= periods before the crises (2007) and after the crises (2010-2012) were called normal periods)	(Purwanto, 2020)

The analysis method in this study was a logistic regression analysis model using the following equation:

$$TUN_{it} = \beta_0 + \beta_1 Pyramidal_{it} + \beta_2 DFam_{it} + \beta_3 DAsing_{it} + \beta_4 KIN_t + \beta_5 KI_{it} + \beta_6 DCrises_{it} + \beta_7 Size_{it} + \beta_8 LEV_{it} + \beta_9 Tobinq_{it} + \beta_{10} Dindustry_{it} + \beta_{11} FCF + \varepsilon \quad (1)$$

Where:

TUN_{it} = Intercorporate loans tunneling (1=tunneling, 0=others)
$Pyramidal_{it}$ = Control rights – Cash flow rights
$DFam_{it}$ = Family ultimate controller
$DAsing_{it}$ = Foreign ultimate controller
KIN_{it} = Non-controlling institutional ownership
KI_{it} = Proportion of independent commissioners
$DCrises_{it}$ = Dummy crisis (1=crisis, 0=normal)

Sizeit = Company size
LEVit = Leverage
Tobinqit = Business growth opportunity
Dindustry = Dummy industry
FCF = Free cash flow
β = Intercept and slope
ε = Error

Hypothesis testing was performed by Wald test to replace t-test in OLS-based linear regression. Independent variable had positive influence on tunneling if sig value, Wald test <0.05 (5%), regression slope (β) and t-test values were positive. Model fit testing was based on Cox & Snell R Square, Nagelkerke R Square, and Hosmer and Lemeshow test scores. Cox and Snell's R Square is a measurement which tries to imitate R2 measurement in multiple regression based on likelihood estimation techniques with maximum value less than 1 (one) so that it's difficult to interpret. Nagelkerke's R square is a modification of Cox and Snell coefficient to ensure that the values vary from 0 (zero) to 1 (one). This is performed by dividing Cox and Snell value by the maximum value (Hair et al., 1998). If the value of Hosmer and Lemeshow goodness-of-fit test statistics ≤0.05, then there is no significant difference between the model and the observed value, so that the goodness-of-fit model is not good because the model can't predict the observes value.

Results and Discussion

Descriptions of Tunneling and Non-Tunneling Sample Data

The research variable data was grouped based on samples with a tunneling indication and samples with a non-tunneling indication. The first group comprised data with an RPT below zero, meaning that related party other payables were smaller than related party other receivables. The second group comprised data with an RPT greater than or equal to zero, meaning that related party other payables were greater than related party other receivables. Table 2 presents detailed descriptions of the variable data based on samples with tunneling and non-tunneling indications.

Table 2. Description of Variables Tunneling and Non-Tunneling

Panel A: Tunneling Indication[a]						
	RPT	Pyramidal	DFAM	DASING	KI	KINS
N	215		152	57		
(%)	(33.18%)		(23.46%)	(8.8%)		
Mean	-0.036	6.785	0.704	0.264	0.367	10.662
Median	-0.004	0	1	0	0.4	9.567
Std. Deviation	0.104	11.582	0.458	0.442	0.173	11.310
Minimum	-0.002	0	0	0	0	0.000
Maximum	-1.120	44.648	1	1	0.800	63.800
Panel B: Non-tunneling Indication[b]						
	RPT	Pyramidal	DFAM	DASING	KI	KINS
N	433		250	135		
	(66.82%)					
Mean	0.024	5.453	0.579	0.313	0.375	17.805
Median	0.000	0	1	0	0.3333	8.062
Std. Deviation	0.096	10.582	0.494	0.464	0.182	9.188
Minimum	0.000	0	0	0	0	0.000
Maximum	1.304	31.385	1	1	0.800	49.588

Note: [a]RPT <0, [b]RPT ≥0
Source: Processed secondary data, 2025

The tunneling activity of intercorporate loans found in this study was 33.18%, a little lower than previous studies (Juliarto et al., 2013; Chizema et al., 2020) which shows 50-65% of tunneling

activity of intercorporate loans. The percentage of total non-tunneling observation samples (66.82%) was bigger than tunneling group (33.18%). The average intercorporate loanss on total asset (RPT) in the tunneling group was -0.036, the maximum was -1,120, showing that intercorporate loanss were higher than total assets, the minimum was -0,002. The average intercorporate loanss (RPT) for the group without tunneling indication was 0.024, the maximum was 1.304 and the minimum was 0.

A pyramidal ownership structure enables controlling shareholders to have higher control rights than cash flow rights. The average difference between control rights and cash flow rights of pyramidal ownership structure in the group with tunneling indication (mean=6.785%) was higher than the pyramidal ownership structure in the group with non-tunneling indication (mean=5,453%). Companies with larger difference between control rights and cash flow rights had a chance of controlling shareholders acquitting the rights of minority shareholders through intercorporate loans, while the acquisition of minority rights had small impact on controlling shareholders.

Total companies with family final controllers which had intercorporate loans tunneling indication was 152 companies or 23.46% of total companies with family controllers in the samples. It showed that related arty loan tunneling activity often happened in companies with family controllers. High control gave controlling shareholders (majority family) power which could be misappropriated in the acquisition of minority rights by intercorporate loans.

Total companies with foreign ultimate controllers which had intercorporate loans tunneling indication was 57 or 8,8% of total companies with foreign controllers in the samples. It showed that intercorporate loans tunneling activity also could happen in companies with foreign controllers. Foreign ownership may become a control mechanism (Juliarto et al., 2011), but when foreign ownerships became controllers, the power of controlling (foreign) shareholders could be misappropriated in the acquisition of minority rights by intercorporate loans.

Observation group with intercorporate loans tunneling indication had lower proportion of independent commissioners (mean=0.367) than the proportion of independent commissioners in the group with non-tunneling indication (mean=0.375). The observation group wth intercorporate loans tunneling indication had lower proportion of independent commissioners than the observation group with non-tunneling indication because higher proportion of independent commissioners made the controlling shareholders more careful in acquitting the rights of minority shareholders, such as by intercorporate loans activity.

Average non-controlling institutional share ownership in the group with tunneling indication (mean=9.883) was lower than non-controlling institutional share ownership in the group with non-tunneling indication (mean=17.805). The observation group with intercorporate loans tunneling indication had lower proportion of non-controlling institutional share ownership than the observation group with non-tunneling indication, because higher proportion of non-controlling institutional share ownership became a control mechanism of intercorporate loans activity, so the controlling shareholders more careful in acquitting the rights of minority shareholders, such as by intercorporate loans activity.

Research Hypothesis Testing

The summary of logistic regression test result is presented in Table 3. Pyramidal ownership structure (PYRAMIDAL) had positive influence on intercorporate loans tunneling ($p=0.072 < 0.05$). The bigger the pyramidal ownership structure, the higher the intercorporate loans tunneling. Regression coefficient score is β (slope) =0.014, meaning that companies which had the opportunity for intercorporate loans tunneling (larger other receivables than other payables) tended to have higher pyramidal ownership structure by $e^{0.014}= 1.014$ or 1.014 than companies which had no intercorporate loans tunneling opportunity (other receivables smaller than other payables), as long as other variables were constant.

Family ultimate controller (DFAM) had positive influence on intercorporate loans tunneling ($p=0.075 < 0.05$). Family ultimate controller was followed by intercorporate loans tunneling. Regression coefficient value (slope) $\beta=0.658$, meant that companies which had the opportunity for intercorporate loans tunneling (other receivables bigger than other payables) had

$e^{0.658}$= 1.930 or 1.930 more likelihood to be companies with family ultimate controllers than companies which had no intercorporate loans tunneling opportunity (other receivables smaller than other payables), as long as other variables were constant.

Table 3. Summary of Result of Logistic Regression Test

	Hypothesis	Parameter		
		β	ϱ	Exp(β)
Constant		-3.802	0.000	0.022
Ownership Structure				
PYRAMIDAL	+	0.014	*) 0.072	1.014
DFAM	+	0.658	*) 0.075	1.930
DASING	+	0.854	**) 0.029	2.350
Governance				
KI	-	0.106	0.831	1.112
KIN	-	-0.017	**) 0.048	0.983
Control Variable				
SIZE		0.385	**) 0.010	1.469
LEV		-0.188	0.430	0.828
TOBINQ		0.000	0.586	0.999
INDUSTRY		0.064	*) 0.057	1.066
FCF		0.000	0.913	1.000
DCRISES	+	-0.105	0.269	0.900
McFadden R-squared		0.042		
Percentage correct		65.30		
Hosmer-Lemeshow (HL) Tests		26.687		
Sig. HL (p)		0.001		

Note: ***) significant at error level 1%, **) significant at error level 5%, *) significant at error level 10%. a) Predictors: (Constant), PYRAMIDAL, DFAM, DASING, KI, KINS, DCRISES, FCF, SIZE, TOBINQ, LEV, INDUSTRY. b) Dependent variable: TUN.
Source: Processed secondary data, 2025

Foreign ultimate controller had positive influence on intercorporate loans tunneling (p= 0.029 < 0.05). Foreign ultimate controller in companies was followed by intercorporate loans tunneling. Regression coefficient value (slope) β=0.854, meant that companies which had the opportunity for Intercorporate loans tunneling (other receivables bigger than other payables) had $e^{0.854}$= 2.350 or 2.350 more likelihood to be companies with foreign ultimate controllers than companies which had no Intercorporate loans tunneling opportunity (other receivables smaller than other payables), as long as other variables were constant.

The regression test (Table 3) didn't find any significant influence of proportion of independent commissioners on intercorporate loans tunneling p=0.831, so the research hypothesis that there was no influence of the proportion of independent commissioners on intercorporate loans tunneling was not proven. Bigger/smaller the proportion of independent commissioners in companies wasn't followed by change of Intercorporate loans tunneling.

Regression test (Table 3) found negative influence of non-controlling institutional ownership on intercorporate loans tunneling (p=0.048 < 0.05). The bigger the institutional ownership in a company, the lower the intercorporate loans tunneling. Regression coefficient value (slope) β=-0.017 meant that companies with had intercorporate loans tunneling opportunity (other receivables bigger than other payables) tended to have $e^{-0.017}$= 0.983 or 0.983 lower institutional ownership than companies without intercorporate loans tunneling, as long as other variables were constant.

Discussion

This study found that pyramidal ownership structure has a positive effect on related loan tunneling (ϱ<0.10). Companies in business groups with pyramidal ownership structure are commonly found

in Indonesia. Companies with concentrated ownership in business groups with pyramida ownership had several advantages, such as: management control, better internal control mechanism and better access to resources), mutually supportive policies between companies within the same groups (Abigail & Dharmastuti, 2022; Ghose et al., 2025; Huang, 2019; Kushwaha & Dixit, 2024; Naskar & Vaidya, 2019). High corporate control and ownership are often associated with effectiveness of legal protection in developing countries. It means that concentrated control and ownership tend to replace weak legal protection (Mandell, 2021; Wulandari & Setiawan, 2023). Beside a number of advantages, concentrated ownership in business groups with pyramidal ownership poses risks on minority shareholders in the form of tunneling. Large control of controlling shareholders in the pyramidal ownership structure (as the agent in agency issue type II) had the potential for misappropriation which harmed minority shareholders (as the principal in agency issue type II). Intercorporate loans in a business group with pyramidal ownership structure had the potential of being used by controlling shareholder to transfer company resources within the business group to only benefit majority shareholders. Current assets were transferred to controlling shareholders using intercorporate loans. Higher control rights than cash flow rights was followed by intercorporate loans tunneling opportunity. Average difference of ownership rights and control rights in pyramidal ownership structure in the group with tunneling indication (mean=6.785) was higher than the group with non-tunneling indication (mean=5.453) (Table 2).

This study found that family ultimate controller has a positive effect on related loan tunneling (ϱ<0.10). In developing countries, due to weak institutional environment, many large companies are under the control of the founders' families (Batubara & Supatmi, 2022; Rusmin et al., 2011; Solarino & Boyd, 2020). If share ownership is spread, individual shareholders can't control the management. Thus, companies can be run according to the managements' wishes. Concentrated family control and ownership will help monitoring company management, so that companies don't need "costly separated mechanisms between management and decision control" (Solarino & Boyd, 2020).

This study found that foreign ultimate controller has a positive effect on related loan tunneling (ϱ<0.10). Foreign ultimate controllers aren't always bad, but the findings of this study showed evidence of risks of the ownership type. Foreign ownership has the potential to be an effective mechanism to complement current governance structure to prevent the management from maximizing the private benefits of intercorporate loans activity (Wulandari & Setiawan, 2023). However, the current study found that when foreign owners became the main controllers of their companies, there was risk of acquisition of minority rights in intercorporate loans tunneling activity.

Although Indonesia has adopted formal provisions, the effectiveness of the implementation is still questionable. PSAK 7 (R2009), for example, has revised PSAK 7 (1994) which requires the disclosure of: 1) transactions, warranties, receivable allowances and debt settlements, 2) disclosure of parties treated equally in normal transactions, 3) recognition of expenses of allowances and eliminations of receivables, 4) classification of the disclosure of related parties, and 5) names of most controlling entities. However, this study found potential intercorporate loans tunneling, which showed inadequate disclosure of related party transactions (e.g. description of transactions under book values (normal)), and only 34.24% of company samples clearly disclosed the names of entities who controlled the group structures the most. The disclosure of normal transactions in the provision of PSAK 7 (R2009) doesn't mean exactly the same, but needs other underlying criteria, for example due to competition, supply chair or mutual support. Thus, not only improvement of regulations for related party transactions, law implementation and enforcement are also important. Compliance and voluntary disclosure should be supported by strong legal protection to become good solutions. Moreover, there should be education for investors, as investors should understand methods to investigate the principle of normalcy (arm's length principle) and ordinary practice of business. Therefore, investors can assess whether the transactions performed by public companies with their affiliated companies contain tunneling elements or not.

Legal framework in Indonesia also hasn't required the discloser of ultimate owners in company group structures. The disclosure of ultimate owner of companies is required to that the

public knows who are at the top of pyramidal ownership. However, legislations, such as Law No. 40 of 2007 on Limited Liability Companies, Law No. 19 of 2003 on State-owned Enterprises (BUMN), PSAK 7 (2009 Revision) and Regulation of Capital Market and Financial Institution Supervisory Agency as the capital market monitoring authority for public companies No. 8 of 1995 haven't required public companies to reveal the ultimate owners of the companies, so the public don't know who are at the top of the pyramidal ownership. The information only can be obtained from company prospectus them the companies make initial public offering (IPO) so the information is available in the Center of Reference of Capital Market in Indonesia Stock Exchange. This information must be published by companies completely according to the provision of Capital Market and Financial Institution Supervisory Agency (Regulation No. IX.C.2: Guideline on the Form and Content of Prospectus in Public Offering). Unfortunately, the disclosure of this information isn't obligated in every company annual report. Actually the disclosure may influence investors' decisions because it shows the real control over companies. Moreover, the lack of transparency of information may also cause other issues, such as a transaction between two parties who, because the information isn't disclosed, can't be recognized as a related party transaction although the transaction happen between two related parties and aren't treated as an arm-length transaction.

The independent commissioners did not have a significant effect on related loan tunneling ($\varrho<0.10$). This study didn't find any influence of effectiveness of independent commissioners in controlling intercorporate loans tunneling. The monitoring mechanism of boards of independent commissioners weren't effective on intercorporate loans tunneling, as evidenced by insignificant and even positive coefficient. Ineffective monitoring of boards of commissioners showed that the boards of commissioners weren't fully independent. The commissioners were too weak in performing their functions due to several factors such as strong position of directors, poor competence and integrity of commissioners, and commissioners occupying the same position in several companies. A director of a parent company becomes a commissioner in the subsidiary, and a director from a subsidiary becomes a commissioner in the parent company.

This study found negative and significant influence of effectiveness of non-controlling institutional ownership in controlling intercorporate loans tunneling. This result supported previous studies (Kushwaha & Dixit, 2024; Solarino & Boyd, 2020) which state that non-controlling institutional shareholders tend to be active in voting than other shareholders, although they don't have enough power in voting rights. The result of this study suggested the importance of non-controlling institutional shareholders to control controlling shareholders in loan tunneling activities. Distribution of shares between external shareholders, i.e. institutional investors, and shareholders dispersion can reduce agency issues. Institutional ownership by insurance companies, banks, investment companies, and ownership by other institutions will encourage more optimal monitoring on management performance.

Of the six control variables used in this study, two control variables, size of company and industry, were statistically significant control variables on intercorporate loans tunneling. This study found that size of company as a control variable had a positive relation with intercorporate loans tunneling. The finding showed that large companies were more prone to intercorporate loans tunneling. Large companies tend to have better visibility for analysts, but large companies are generally parent companies where controlling owners have large control rights in controlling the parent companies of companies in business groups, so the potential of intercorporate loans tunneling was large, in line with the scale of the companies.

This study found that intercorporate loans tunneling potential was different in every industry. High potential of intercorporate loans tunneling was high in certain industrial sectors, and low in others. For example, growing industrial sector tended to need more sources of fund, whether from business groups or outside of them. If sources of fund from outside of business groups were more costly, tunneling was facilitated. Similarly, in negatively growing industrial sector, the needs for internal sources of fund in business groups would increase to safe member companies from bankruptcy, so this study recommended future researches to examine intercorporate loans tunneling in specific industries.

Conclusion and Implication

The study found the following results: 1) Pyramidal ownership structure had positive influence on intercorporate loans tunneling. 2) Family ultimate controllers had positive influence on intercorporate loans tunneling. 3) Foreign ultimate controllers had positive influence on intercorporate loans tunneling. 4) Independent commissioners had insignificant influence on intercorporate loans tunneling. 5) Institutional ownership had negative influence on Intercorporate loans tunneling. 6) Financial crisis had no significant influence on intercorporate loans tunneling. This study provided empirical evidence that intercorporate loans transaction is a means for tunneling, although regulation framework has improved since Asian financial crisis 1997. Pyramidal ownership and family ownership structures aren't always bad, but this study showed a risk of those types of ownership. This study gave theoretical contribution by providing empirical evidence of influence of pyramidal ownership structure on intercorporate loans tunneling. Pyramidal ownership structure enables controlling owners to have large control rights but small cash flow rights. The difference between control rights and ownership has the potential to be used for intercorporate loans tunneling. It's because acquisition has small impact on controlling shareholders. High control and ownership of controlling shareholders, especially in pyramidal ownership structure, are inevitable, so control mechanism may be improved. Investors may play a role in using available information, encourage information disclosure, so that control mechanism of markets will be more effective.

The contribution of independent variables in explaining the varying changes of variable Y (intercorporate loans tunneling) is only 4.2% (low). The contribution of independent variables in explaining the varying changes of variable Y was low, but reliable (meeting model fit criteria because the Hosmer-Lemeshow test significance is smaller than 0.05) and provided evidence of tunneling. Grace-Martin (2012) in "Can a Regression Model with a Small R-squared Be Useful?" states that small R-squared still can be used. Another reason for low contribution of independent variables in explaining intercorporate loans tunneling was the measurement of variable intercorporate loans tunneling. This study used cut off tunneling if the difference between related party other receivables and related party other payables was > 0 or conversely the difference between related party other payables and related party other receivables < 0. The result was supported by the finding of influence of ownership structure on intercorporate loans tunneling which showed evidence of intercorporate loans tunneling in public companies in. However, cut off $= 0$ was only based on estimation of tunneling potential. Tunneling only happened in higher difference between related party other receivables and related party other payables. The model to determine cut off tunneling can be developed by adopting financial behavior literatures in predicting stock price by separating normal (random) and abnormal (not random) transactions. However, there hasn't been any literature which develops cut off tunneling model as of the time of this study.

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