International Journal of Cyber and IT Service Management (IJCITSM)
Vol. 6, No. 1, April 2026, pp. 10−24
E-ISSN: 2808-554X | P-ISSN: 2797-1325, DOI:10.34306

Unveiling the Hidden Risks of Capital Inflows on Non-Financial Firm Performance in Indonesia

Hesti Werdaningtyas[1*], Noer Azam Achsani[2], Anny Ratnawati[3], Tony Irawan[4]
[1, 2, 3, 4]School of Business, IPB University, Indonesia
[1]hesti_w@bi.go.id, [2]achsani@gmail.com, [3]aratna@apps.ipb.ac.id, [4]tony.irawan82@gmail.com
***Corresponding Author**

Article Info

Article history:

Submission July 28, 2025
Revised August 20, 2025
Accepted December 15, 2025
Published December 22, 2025

Keywords:

Capital Inflows
Foreign Debt
Non Financial Corporation
System Generalised Methods
Firm Level Analysis

ABSTRACT

The limited research on the impact of external debt on financial system stability at the micro level creates a clear need for further investigation. The positive contributions to the relevant discourse of this study lie in its attempt to address that gap by conducting a comprehensive micro panel data analysis, covering the performance of 523 individual Non-Financial Corporations (NFCs) in Indonesia, based on panel data. Additionally, this study employs advanced **methodology,** utilising a dynamic model and System-Generalised Methods of Moments (Sys-GMM) estimation. The research have tackled endogeneity issues using GMM estimators to ensure the robustness of our findings. The **results** indicate that different capital flows exert varying impacts on corporate performance. In particular, private external debt inflows and Portfolio Investments (PI) have a positive influence on the financial stability of firms. Conversely, direct investment in manufacturing firms and corporate credit growth have a significant impact on corporate financial stability. From a macroprudential policy perspective, the **findings** highlight the importance of monitoring corporate vulnerabilities, as it may pose risks to the banking sector. **These insights** provide valuable guidance for policymakers in developing more effective external debt management strategies to ensure financial stability.

1. INTRODUCTION

Global GDP and inflation prospects improved in May 2025, leading to renewed strength in capital inflows to Emerging Markets (EMs) amid improving global risk appetite. EMs continue to eke out further gains, but the range of possible outcomes is very wide, and there is a risk of a renewed period of EMs outflows [1–3]. Indonesia has experienced significant foreign capital inflows, with foreign financing accounting for approximately 21% of the economy. NFCs, which encompass a diverse range of businesses from manufacturing to services, have the potential to act as a sector that can transmit external risks to the domestic economy due to their relatively high dependence on external factors [4]. Fluctuations in capital flows can impact corporate vulnerabilities and consequently affect banking [5].

The impact of various capital flows on financial system stability requires more in-depth examination in existing research, particularly in macroeconomic analysis [6]. The small number of studies using dynamic panel data and macro-financial linkage approaches at the micro level indicates this shortcoming [7]. Previous research has mainly focused on analysing the impact of capital flows on economic growth and volatility at

the country level [8, 9]. While [10] highlights aggregate effects, our research expands on this by analysing specific corporate responses by sector, thereby revealing previously unexamined micro-level risk channels. Recognising the paucity of previous research, this study highlights the importance of conducting a more in-depth examination of the impact of capital flows on financial system stability.

Figure 1. SDGs 8 and SDGs 9

This study investigates how capital inflows, including external debt, affect corporate financial stability in Indonesia. The research fills a key gap by analysing micro-level panel data from 523 NFCs, capturing performance variations and sectoral differences. It also aligns with SDGs 8 on inclusive and sustainable economic growth [11, 12] and SDGs 9 on resilient industry, innovation, and infrastructure [13] as shown in Figure 1. Methodologically, this study applies a dynamic Sys-GMM model and offers a rare empirical linkage between firm-level financial risk (Z-score) and macro capital inflow dynamics, bridging corporate finance and macroprudential policy.

This study also contributes to the literature by tackling endogeneity issues using GMM estimators to ensure the robustness of our findings. Despite growing attention to macro-financial linkages, few studies have examined how firm-level financial stability is influenced by disaggregated capital inflows in emerging economies, such as Indonesia [14]. The findings are expected to enhance understanding of the relationship between capital inflows, firm performance, and financial stability. Policymakers can gain useful information from this kind of research, especially in optimising private external debt policy in Indonesia.

2. LITERATURE REVIEW

The literature review contains descriptions of theories, findings and other research materials obtained from the reference materials used as the basis of the research. Key theoretical and empirical studies that investigate the relationship between foreign capital flows and firm performance across different economic contexts. Particular attention is given to the type and maturity of capital inflows, such as Foreign Direct Investment (FDI), Portfolio Investments (PI), and Short-Term Capital Flows, and their varied implications on firm-level outcomes, credit allocation, and financial market performance [15].

2.1. Theoretical Studies

The Mundell-Flemming model analyses economic policy in the context of countries involved in international trade and finance, and facing international capital mobility. In the context of countries experiencing financing shortages, the Mundell-Fleming theory is very relevant to this study because it shows how capital inflows can help close the domestic savings deficit, also known as the savings-investment gap. Countries with low domestic savings need foreign capital inflows to finance their investment and economic growth [16].

2.2. Capital Flows and Firm Performance in Emerging Economies

[17] conducted a firm-level study on Turkish companies using Swamy's random coefficient model. Their findings reveal that while FDI and PI as a percentage of GDP do not significantly influence firm profitability, short-term capital inflows and other investment flows have a statistically significant effect on firm performance. This highlights the sensitivity of firm profitability to the maturity and nature of capital flows rather than their sheer volume [18].

Similarly, [2] explored the dynamic relationship between foreign capital inflows and stock market performance in Nigeria using the ARDL Bounds Testing approach. The study finds no evidence of a long-run relationship between FDI, PI, and stock market performance. However, in the short run, FDI shows no significant effect, whereas PI exerts a positive and statistically significant impact, indicating that foreign PI may contribute to market liquidity and investor sentiment, albeit temporarily [19, 20].

2.3. Misallocation Effects of Short-Term Capital Flows

[21] examine the credit allocation effects of short-term capital inflows in China. Their empirical analysis shows that short-term debt inflows disproportionately channel credit toward low-performing firms, leading to significant inefficiencies in the financial system. Conversely, short-term equity inflows demonstrate more cautious behavior, with evidence suggesting delayed support for credit growth among high-performing firms. These findings underline the destabilizing potential of speculative capital and the importance of monitoring credit allocation mechanisms.

2.4. Capital Controls and Firm-Level Outcomes

[22] assess the macroeconomic and microeconomic implications of capital control policies in Chile. The study concludes that while capital controls suppress overall investment and output, they also enhance export activity, increase the proportion of exporting firms, and boost Total Factor Productivity (TFP) [23, 24]. The positive outcomes are particularly strong among capital-intensive and export-oriented firms, suggesting that capital controls may offer targeted benefits under certain structural conditions [25, 26].

2.5. The Role of Foreign Debt in Firm Performance

Digging deeper, [27] found that capital inflows have a significant impact on asset growth and financial stability. [28] found that capital inflows alleviate financial constraints and foster industrial growth in developing countries. This research highlights that capital inflows boost corporate debt, size, and revenue, potentially increasing banking risks. The hypothesis is that capital inflows, including foreign debt, have a significant impact on corporate financial stability [29].

[30] investigate the relationship between debt financing and firm performance during the pre-crisis and post-crisis periods. Their results indicate a significant negative effect of leverage on firm performance, even when controlling for endogeneity. However, firms with some degree of foreign debt financing outperform those relying solely on domestic borrowing. Furthermore, the scale of foreign financing has a robust and positive effect on firm-level performance metrics. [31] present complementary evidence from Pakistan, where both short-term and long-term debt negatively affect firm profitability. Nonetheless, internal firm characteristics such as sales growth and size have a compensatory positive effect, reinforcing the view that capital structure decisions must account for firm-specific dynamics.

The literature converges on the notion that the impact of foreign capital flows on firm performance is complex and contingent upon the nature of the flows, their duration, and the domestic financial environment. While certain types of capital inflows can enhance firm productivity and market efficiency, others may lead to resource misallocation or heightened financial vulnerability. Policymakers and firms alike must therefore consider both macroprudential frameworks and firm-level strategies to optimize the benefits of international capital mobility [32].

2.6. Indonesian Foreign Debt Policy

Due to fluctuations in demand and external factors, global capital flows can lead to financial instability and recessions [33]. Based on theoretical insights, regulation is necessary to prevent excessive short-term debt and the use of risky financial instruments. Bank Indonesia's Regulations No. 16/21/PBI/2014 and No. 16/22/PBI/2014 promote prudent management of exchange rate, liquidity, and debt risks [34]. Requirements, Maintaining a hedging ratio of at least 25% for net foreign exchange liabilities, Keep a liquidity ratio of at least 50% for net foreign exchange liabilities, Achieving and maintaining a credit rating no lower than one level below investment grade. Corporations must provide Bank Indonesia with accurate and timely reports on their foreign exchange activities and debt management.

2.7. Capital Flows in Indonesia

Capital flows refer to financial transactions that occur in the context of foreign investment. FDI refers to investments made by non-residents in companies located in Indonesia. PI on the liability side includes transactions for acquiring securities issued by residents to non-residents. Other Investments (OI) on the liability

side encompass transactions involving the receipt of loans and other obligations from non-residents. Private external debt refers to the external debt of residents (excluding the government and central bank) to non-residents (Metadata, Bank Indonesia 2020).

3. METHODOLOGY

3.1. Empirical Model: Capital Inflow on Non-Financial Corporation

The study applies a two-step Generalised Method of Moments (GMM) dynamic panel regression estimator, using lagged explanatory and dependent variables as instruments [35]. This method effectively resolves endogeneity, controls individual fixed effects, and provides unbiased causal estimates. It also accommodates unbalanced panel data with varying time periods and observation frequencies. Furthermore, instrument validity tests such as the Sargan and Hansen tests ensure the reliability and robustness of the instruments used. The GMM framework is particularly suitable for financial studies with potential simultaneity bias and dynamic relationships, allowing this research to generate consistent estimates and deeper insights into the effects of capital inflows on corporate financial stability [36].

These advantages make GMM dynamic panel regression a valuable tool in economic and financial research requiring complex panel data analysis. Given the study's focus on capital inflows and financial stability, the analytical approach adopted in this research draws upon deep expertise in financial economics, macroprudential policy, and econometrics. The use of the System GMM estimator reflects the authors' application of rigorous quantitative methods commonly used in empirical finance to address endogeneity, dynamic behavior, and heterogeneity across firms. This econometric framework enables a robust assessment of the link between capital flow volatility, corporate performance, and macro-financial stability aligning with Indonesia's ongoing macroprudential reforms and global financial integration dynamics. Based on the model specifications used, refer to the [37] model, with modifications:

$$S_{it}^{NFC} = \alpha_0 + \alpha_1 S_{it-1}^{NFC} + \alpha_2 CF_t + \alpha_3 X_{it}^{NFC} + \alpha_4 XM_{it} + \alpha_5 DFD_t^{NFC} + \alpha_6 Cl_{it} \times DSector_{it} + \varepsilon_{it} \quad (1)$$

The model forms the basis for analyzing how capital inflows influence the financial stability of NFCs in Indonesia [38]. By combining firm, macroeconomic, and sectoral variables, it captures key financial linkages. The model is modified by introducing interaction terms between net capital inflows and individual economic sectors namely the primary, manufacturing, trade, construction, and other sectors. This approach aims to more deeply explore how the effects of capital inflows may vary across sectors, given differences in financing structures, degrees of global market exposure, and capital intensity. Incorporating these sectoral interaction variables enables the model to capture the heterogeneity of sectoral responses to fluctuations in capital inflows, an aspect that has not been fully addressed in previous studies. Methodologically, this modification provides an important contribution to the macro-financial linkage literature by emphasizing cross-sector variation in the transmission of capital inflows, thereby offering a more granular understanding of their implications for domestic financial stability. The baseline model specification, with this modification, is as follows Table 1 outlines the variables used to explain variations in corporate stability and capital flow dynamics.

Table 1. Details of the empirical model components

Label	Definition	Hypothesis
S_{it}^{NFC}	Z-score (bankruptcy risk, using [39]). The higher the Z-score, the less the probability of bankruptcy, resulting in a more direct measure of corporate financial stability. $$Z_{score} = \frac{ROA + ETA}{\sigma ROA},$$ where ROA is the return on the asset, ETA is the equity to asset ratio, and σ is the standard deviation.	-
CI_t	Capital Inflows (Foreign Direct Investment, Portfolio Investment, Other Investment, Foreign Debt Non-Financial Corporation).	(+/-)
X_{it}^{NFC}	Corporate performance characteristics (size, growth, efficiency, and liquidity).	(+)

Label	Definition	Hypothesis
XM_{it}	Control macroeconomic variables (Trade, Credit, Inflation, GDP, BI Rate, Interest Differential Rate).	(+/-)
DFD_{it}^{NFC}	Dummy foreign debt policy for Corporations.	(+)
$CI \times DSector_{it}$	CI (Capital Inflows) Interaction Dummy with Primary Sector, Manufacturing, Trade, Construction, and other Sectors.	(+)

Altman's z-score (Z-Score of ROA) and Non-Performing Loans (NPL) are widely used in empirical research as measures of firm stability due to their high correlation with default probability. Altman's z-score, which serves as a proxy for financial distress in firms, is then assumed to impact bank credit risk. The advantage of this model is its applicability to a wide range of companies. Its drawbacks include its inability to predict when a company will go bankrupt and its less accurate use for new companies, which often yield relatively low estimates [40].

3.2. Data

This study utilised data from publicly traded NFCs listed on the IDX, primarily sourced from Bloomberg [41]. Companies with missing data or negative equity were excluded to ensure balanced panel data. The micro panel data analysis, which encompasses the performance of these 523 corporations in Indonesia, enables a more detailed examination. Details of each variable are presented in Table 2.

Table 2. Variable and Definition

Variable	Operational Definition	Source
	Independent Variable	
	Financial Stability ([42, 43])	
Z-Score	Measuring individual Corporation Solvency Risk, $\frac{ROA + ETA(\text{Equity/Asset})}{\sigma ROA}$	Bloomberg, processed
	ROA, Net Income to Asset (%), ETA, Equity Capital to Asset (%)	
	σROA (Three years rolling)	
	Dependent Variable	
CI	Capital Inflows	BI, processed (Billion Rp, USD × Exchange Rate average 3 month) % GDP
FDI	Foreign Direct Investment	
OI	Other Investment	
PI	Portfolio Investment	
FD	Foreign Debt	
	Performance Variables (523 NFCs) [42]	
Size	Natural Log Asset of individual Corporation (Billion Rp)	Bloomberg, processed
Growth	Growth of total assets (%)	
Efficiency	Inventory Turnover (Cost of Goods Sold / Average Inventory)	
Liquidity	ICR (Interest Coverage Ratio), EBIT / Interest Expense	
CI × DSector	CI (Capital Inflows) Interaction Dummy with • Primary Sector, • Manufacturing, • Trade, • Construction, • and other Sectors.	
	Variable Dummy Policy for FX Debt and Pandemic ([44–46])	
DFD	Bank Indonesia Policy on Foreign Debt NFC	BI Law
DCovid	Period of pandemic	

Variable	Operational Definition	Source
	Variable Control (Macro) ([47, 48])	
Riil GDP	Growth of GDP real (%)	BPS, processed
Trade	Export and Import to GDP (%)	
Credit	Ratio of Credit to GDP (%)	BI, processed
Inflation	Inflation (% yoy)	CEIC, processed
Exchange Rate	Three-month average exchange rate (IDR/USD)	
Policy Rate	2005Q3–2016Q2: BI Rate; 2016Q3–2021Q4 with BI 7DRR (% p.a)	BI, processed

Table 3 provides a descriptive and explanatory summary of statistics. It shows that over the twelve years from 2010 to 2021.

Table 3. Statistics descriptive

	Correlation with Z-score	**Obs**	**Mean**
Zscore	1.000	20105	3.946
ZScore (t-1)	0.923	19582	3.983
CI/GDP	0.037	25104	3.923
DI/GDP	0.030	25104	2.038
PI/GDP	0.008	25104	1.588
OI/GDP	0.041	25104	0.374
FD/GDP	-0.227	25104	12.728
Size Asset	0.201	20627	7.570
Growth Asset	0.092	18520	12.882
ITO	0.003	18685	36.417
ICR	0.106	19194	45.656
Trade/GDP	0.053	25104	0.593
Credit/GDP	-0.233	25104	32.816
GDP Growth	0.128	25104	4.657
Interest Rate	0.073	25104	5.089
Inflation	0.126	25104	4.295

The descriptive statistics in Table 3 indicate that the Z-score, as a measure of corporate financial stability, maintains a strong correlation with its lagged value, reflecting persistence in firm performance over time. Capital inflow variables such as FDI, PI, and other investments show moderate correlations, suggesting differentiated impacts on firm-level solvency. Meanwhile, the negative association between credit-to-GDP ratio and the Z-score highlights the potential vulnerability of excessive credit growth to financial instability. These patterns justify the use of dynamic modeling approaches to capture the time-dependent and cross-sectional variation in financial behavior among NFCs.

4. RESULTS AND DISCUSSION

As shown in Table 4, the coefficient was estimated using a two-step system GMM difference regression. Additionally, the research conducted post-estimation analyses. To ensure the robustness and validity of the empirical model, several diagnostic tests were performed to confirm that the model met the assumptions of consistency, reliability, and absence of serial correlation in the estimated parameters, including:

- Robustness check.
  The GMM model requires several tests to specify the model in order to provide valid and consistent results, namely a model that does not have serial correlation in the error and instruments used as a whole in a valid model.

- Assess the feasibility of the model by looking at the results of the AR (1) and AR (2) values which are the pvalues for first and second order autocorrelation disturbances.
  The test for AR (1) usually rejects the null hypothesis, but an important indicator is shown by the value

of AR (2). Based on the output of the corporate model above for the CI, FDI, PI, DI and ULN models, it shows that the p-value of AR (1) is significant, the AR (2) value in the GMM system model for the CI, FDI, OI and ULN models is still below alpha 5% while the PI model is above 5%. It is concluded that only in the PI model there is no serial autocorrelation in the error at alpha 5%, the CI, FDI, OI and ULN models do not experience serial autocorrelation in the error at alpha 1%.

- Hansen's test for overidentifying Restriction tests the validity of the variable instrument as a whole. The null hypothesis of this test is that the variable instrument used is valid. The feasibility of the research model to estimate the model is if the chi square probability value has a significance level greater than 0.1 or 0.5 or 0.01 then accept H0 or in other words the variable instrument used is valid.

Table 4. The Sys GMM results

Dependent Var.	**1**	**2**	**3**	**4**	**5**
	FD	**OI**	**DI**	**PI**	**CF**
	Coef./p	**Coef./p**	**Coef./p**	**Coef./p**	**Coef./p**
ZScore (t-1)	0.8570***	0.8220***	0.8358***	0.8235***	0.8420***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CF (FD/GDP)	0.6628**	-	-	-	-
	(0.0187)	-	-	-	-
CF (OI/GDP)	-	0.0191	-	-	-
	-	(0.9050)	-	-	-
CF (DI/GDP)	-	-	0.2559	-	-
	-	-	(0.5836)	-	-
CF (PI/GDP)	-	-	-	0.3143**	-
	-	-	-	(0.0342)	-
CF/GDP	-	-	-	-	0.0917
	-	-	-	-	(0.4206)
CF * D. Manufacturing	-0.024	0.1706	0.9527**	-0.2095	-0.0314
	(0.8831)	(0.3800)	(0.0459)	(0.1527)	(0.8068)
CF * D. Trade & Service	0.0223	-0.0939	0.7421	-0.3351**	-0.1084
	(0.8951)	(0.6638)	(0.1174)	(0.0196)	(0.4183)
CF * D. Construction	-0.0719	0.2768	0.2977	-0.1898	0.0491
	(0.7220)	(0.3522)	(0.5755)	(0.2213)	(0.7334)
CF * D. Other sectors	-0.512	-0.035	0.0671	-0.217	0.0168
	(0.1748)	(0.9189)	(0.9266)	(0.3082)	(0.9360)
D. Manufacturing	1.2209	0.8388***	-1.0671	1.2340***	1.0683**
	(0.5718)	(0.0010)	(0.2756)	(0.0001)	(0.0402)
D. Trade & Service	0.9529	1.2384***	-0.3352	1.7065***	1.6892***
	(0.6688)	(0.0003)	(0.7326)	(0.0000)	(0.0034)
D. Construction	1.43	0.4462*	-0.1447	1.0375***	0.3151
	(0.5926)	(0.0715)	(0.8961)	(0.0056)	(0.5818)
D. Other sectors	7.2241	0.4202	0.2125	0.7341*	0.316
	(0.1514)	(0.1474)	(0.8865)	(0.0971)	(0.7152)
ln(Asset)	0.8650***	0.7783***	0.7892***	0.7359***	0.8168***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Credit/GDP	-0.7308***	-0.2183**	-0.4762***	-0.1164	-0.3209***
	(0.0039)	(0.0358)	(0.0007)	(0.7492)	(0.0033)
Policy Rate	-0.0936	0.0519	0.2612***	-1.2276	-0.0093
	(0.1527)	(0.3192)	(0.0012)	(0.4730)	(0.9039)
Dummy_FD	2.924	-4.3687	3.348	-3.0361	-1.491
	(0.6561)	(0.3504)	(0.5325)	(0.4914)	(0.7593)

Dependent Var.	**1**	**2**	**3**	**4**	**5**
	FD	**OI**	**DI**	**PI**	**CF**
	Coef./p	**Coef./p**	**Coef./p**	**Coef./p**	**Coef./p**
GDP Growth	0.0113	-	-	-	-
	(0.3577)	-	-	-	-
AR (1)	0.000	0.001	0.000	0.000	0.002
AR (2)	0.9492	0.9931	0.9626	0.9554	0.9601
Hansen Test	0.6236	0.8012	0.8844	0.0692	0.1427
No. of Obs.	19572	19572	19572	19572	19572
Explanation:	• Model of the impact of foreign debt (FD) on corporate financial stability.				
	• Model of the impact of other investment (OI) on corporate financial stability.				
	• Model of the impact of direct investment (DI) on corporate financial stability.				
	• Model of the impact of portfolio investment (PI) on corporate financial stability.				
	• Model of the impact of capital inflows (CF) on corporate financial stability.				

Note: Statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Capital inflows, including FDI and PI, play a crucial role in determining corporate financial stability [49]. This result is supported by [50] and [51]. Increased FD and PI often correlate with improved corporate performance, mainly because such inflows are typically accompanied by hedging strategies designed to mitigate associated risks. In Indonesia, since early 2015, the monetary authority has mandated that non-bank corporations employ hedging practices for foreign debt, particularly those denominated in foreign currencies, to manage exchange rate risks effectively. This policy has had a generally positive impact, resulting in lower corporate vulnerability, though the effect is insignificant.

Another finding that supports the results is that the debt-to-equity ratio in Indonesia, based on data as of April 2025, remains well below the threshold of 1 or 100 percent, with an aggregate level of 0.57 or 57% as shown in Table 5. This relatively low ratio indicates that most corporations maintain a conservative capital structure, relying more on equity than debt. Such financial prudence reflects firms awareness of external risks and their efforts to sustain long-term solvency. The result also suggests that Indonesian companies continue to prioritize internal financing stability to strengthen resilience against market fluctuations and global financial uncertainty.

Table 5. Debt-to-Equity Ratio NFC

DER						
Debt to Equity Ratio						
Sector	**2023-12**	**2024-06**	**2024-09**	**2024-12**	**2025-03**	**2025-06**
A. Agriculture	0.59	0.58	0.57	0.57	0.56	0.49
B. Mining	0.45	0.43	0.42	0.43	0.39	0.39
C. Manufacturing	0.51	0.54	0.52	0.52	0.54	0.50
D. Electricity, Gas, and Water Supply (EGWS)	0.52	0.45	0.45	0.44	0.49	0.41
E. Construction	0.80	0.75	0.72	0.68	0.67	0.89
F. Trade	0.43	0.45	0.43	0.40	0.40	0.40
G. Transportation	1.22	1.26	1.20	1.15	1.15	1.07
H. Business Services	0.27	0.26	0.27	0.26	0.26	0.34
I. Social Services	0.29	0.30	0.29	0.26	0.23	0.25
J. Others	0.03	0.03	0.02	0.03	0.03	0.07
Grand Total	**0.59**	**0.59**	**0.58**	**0.57**	**0.57**	**0.58**

Source: [41]

Sector-specific analyses reveal that direct investment in the manufacturing sector has a notable impact on corporate stability. The significant positive effect of FDI in manufacturing firms indicates that long-term capital commitment improves solvency, potentially via technology transfer and productivity gains. This finding aligns with previous research indicating that long-term direct investments are crucial for providing additional

capital that companies need. The strategic use of hedging and targeted investments enhances financial resilience in the corporate sector.

Other findings are that corporate performance variables, particularly asset growth, have a significant positive effect on financial stability, indicating that improved asset growth is associated with better corporate performance [52]. Conversely, an increase in the credit to GDP ratio negatively impacts corporate financial stability, underscoring the importance of closely monitoring credit expansion. Interest rate variables have mixed effects on corporate financial stability [53]. The results from robustness tests show that the model performs well in describing corporate vulnerability. Given the significant impact of capital inflows mainly PI and FDI on corporate stability, it is essential to periodically monitor FD and maturing PI from a macroprudential policy perspective [54].

The share of long-term external debt (ULN) remains dominant, which carries important implications. From a prudential perspective, the dominance of long-term corporate external debt reflects a cautious approach to external financing and risk management [55]. A larger proportion of long-term ULN indicates a preference to avoid short-term refinancing risks and funding cost fluctuations driven by global interest rate volatility. This pattern also suggests that firms seek sustainable investment financing, manage debt maturities more evenly, and reduce vulnerability to external pressures such as exchange rate shocks or shifts in global liquidity conditions, as illustrated in Figure 2 and supported by Table 1.

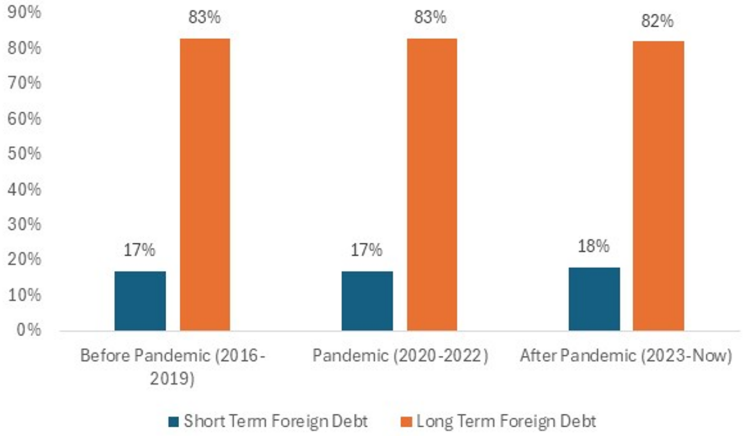

Figure 2. Share of Short-Term and Long-Term External Debt (Modified from External Debt Statistics, Bank Indonesia, 2025)

Corporate external debt (ULN) in Indonesia also demonstrates a high level of compliance with hedging and liquidity ratio requirements as part of prudential principles, as shown in Table 6 which highlights key aspects of external debt among corporations. Corporations remain potential recipients of direct financing through external debt (ULN) although access to such financing has become increasingly constrained over time. Policy efforts are therefore needed to ease corporate access to external debt, including through adjustments to macroprudential foreign exchange regulations or Implementation of Prudential Principles (KPPK).

Table 6. Hedging Practices Among Publicly Listed Companies

Category	**Corporations Required to Hedge**				**Liquidity Ratio (min 70%)**	
	0–3 Months		**3–6 Months**		**0–3 Months**	
	Hedging	**Not Hedging**	**Hedging**	**Not Hedging**	**Compliant**	**Not Compliant**
Number of Corporations	286 (53%)	234 (47%)	60 (27%)	160 (73%)	2,254 (88.1%)	304 (11.9%)
Outstanding External Debt	USD 28.9 Billion	USD 7.8 Billion	USD 5.8 Billion	USD 11 Billion	USD 138.8 Billion	USD 9.5 Billion
Hedging Value	USD 4.1 Billion	-	USD 808.9 Million	-	USD 5.7 Billion	USD 220.5 Million

The data presented in Table 6 reveal that the majority of publicly listed corporations in Indonesia comply with hedging and liquidity ratio requirements, reflecting a strong commitment to prudential financial management. Firms with higher levels of compliance tend to maintain greater financial resilience against external shocks, particularly exchange rate volatility and interest rate fluctuations. The substantial proportion of corporations that fulfill hedging obligations within a 0–3 month period indicates proactive risk mitigation behavior. These results underscore the effectiveness of Bank Indonesia's prudential policies in promoting sound financial practices while ensuring that corporate debt structures remain sustainable in the face of global financial uncertainty.

4.1. The Role of Control Variables: Assets, Credit, and Interest Rates

The estimation results indicate that corporate stability proxied by the lagged Z-score exerts a positive and significant effect on the current Z-score, confirming the presence of persistence in corporate financial conditions. This finding highlights the path-dependent nature of corporate risk: firms that were financially vulnerable in the previous period tend to remain influenced by that vulnerability, while firms with strong fundamentals are more capable of maintaining resilience. Such persistence implies that firms with low Z-scores face a higher probability of experiencing continued financial stress, both in meeting short-term obligations and in withstanding external shocks such as capital-flow volatility, exchange-rate depreciation, or global interest-rate tightening. Conversely, firms with higher Z-scores tend to exhibit greater financial stability. This dynamic trend further justifies the use of a dynamic panel framework (System GMM), which effectively captures intertemporal risk formation.

The analysis also reveals that asset growth has a positive and significant impact on corporate financial stability, indicating that stronger asset expansion is associated with improved corporate performance. Firm size (lnAsset) consistently exhibits a positive and highly significant effect across all model specifications, underscoring that larger firms generally possess stronger financial structures, broader business diversification, and more stable access to financing.

By contrast, the credit-to-GDP ratio shows a negative and significant effect in several models, suggesting that increases in corporate credit relative to GDP do not necessarily strengthen financial stability and may instead raise the risk of over-leveraging, particularly when not supported by adequate improvements in firm fundamentals.

4.2. Effectiveness of Hedging Policy

Since 2015, Indonesia's monetary authority has mandated NFCs to hedge their foreign currency-denominated external debt. While the hedging variable is not statistically significant in the aggregate model, the significant positive effects of FDI and PI on the Z-score can be interpreted as indirect evidence of the hedging policy's effectiveness, as these capital inflows tend to be accompanied by risk mitigation instruments. This policy plays a key role in limiting exposure to exchange rate fluctuations and enhancing the quality of corporate financial risk management especially among large and publicly listed firms with stronger technical capacity and regulatory compliance.

This finding is consistent with [56], who evaluated the effectiveness of Capital Flow Management (CFM) policies in Indonesia using empirical analysis of various instruments adopted since the financial liberalization era. The study demonstrated that CFM measures such as capital controls, macroprudential tools, and monetary interventions contributed significantly to mitigating capital flow volatility and maintaining macroeconomic stability, particularly during external shocks. [56] also emphasized that the timing of implementation, the combination of instruments, and domestic market conditions are critical to the success of these policies.

From a technical perspective, the empirical framework applied in this study based on the dynamic System GMM approach can be extended beyond Indonesia to other EMs that face similar capital flow and financial stability challenges [57]. The flexible model structure allows the inclusion of additional high-frequency financial variables and can be integrated with big data systems to capture real-time corporate and macroeconomic dynamics [58]. Moreover, combining this econometric framework with machine learning algorithms such as Random Forest, XGBoost, or LSTM networks can enhance predictive capability, uncover non-linear interactions, and support early warning systems for financial vulnerabilities [59]. This adaptability highlights the model's potential contribution to developing AI-driven macroprudential policy tools for emerging economies [60, 61].

Building upon these findings, the empirical framework of this study can be utilized to develop digital decision-support applications that assist policymakers and corporations in managing financial stability risks

[62]. By integrating firm-level data and macroeconomic indicators, such systems could provide early warning signals and scenario simulations to forecast the impact of capital flow volatility on corporate solvency. For policymakers, this would enable evidence-based formulation of macroprudential regulations, while corporations could use similar analytical dashboards to optimize debt structure, liquidity, and hedging strategies. The integration of econometric models with application based interfaces supported by machine learning and cloud analytics could thus transform the study's findings into actionable insights for financial governance and risk management in real time [63].

5. MANAGERIAL IMPLICATIONS

At the managerial level, the findings suggest that firms and banks must respond to volatile foreign capital flows with prudent and adaptive risk management strategies. Corporations need to implement effective approaches in managing foreign exchange, capital structure, and liquidity to mitigate potential risks. Firms with foreign currency-denominated debt are particularly exposed to exchange rate fluctuations resulting from capital inflows, making active hedging strategies essential to minimize sudden and substantial exchange rate losses. During periods of large inflows and low interest rates, companies may be tempted to increase leverage; however, management should maintain a balanced capital structure by avoiding excessive borrowing and strengthening the corporate capital base through fiscal incentives or tax reforms that discourage overreliance on debt. Moreover, as capital inflows often increase short-term liquidity, firms must allocate excess liquidity prudently to prevent speculative investments or unproductive expansions. These managerial actions are crucial for enhancing financial resilience and ensuring sustainable corporate growth amid volatile capital movements.

6. CONCLUSION

Net capital inflows, particularly External Debt (FD) and PI, significantly improve corporate financial stability. Higher levels of FD and PI are associated with improved corporate performance, which is consistent with the use of hedging strategies to mitigate risk. Bank Indonesia's policy on External Debt for Non-Financial Companies has a positive effect, resulting in relatively low corporate vulnerability under this policy. Furthermore, FDI impacts the financial stability of manufacturing companies. Given the significant impact of capital inflows, particularly FD and PI, it is crucial to monitor corporate credit-to-GDP ratios from a macroprudential perspective to manage potential banking risks. The estimation results show that corporate financial stability, as represented by the Z-score in the previous period, has a positive and significant effect on the Z-score in the current period, confirming the persistence of corporate financial conditions. Corporate risk depends on its development path: companies that were previously vulnerable are more likely to experience sustained pressure, both in terms of their ability to meet short-term obligations and their resilience to external shocks such as capital flow volatility, currency depreciation, and tightening global interest rates. Conversely, companies with strong fundamentals tend to maintain their stability. This finding also supports the use of a dynamic panel model (System GMM), which is able to capture risk dynamics between periods more accurately.

The findings of this study provide valuable insights for policymakers in developing more effective foreign debt management strategies that promote financial stability and foster sustainable economic growth. From a macroprudential standpoint, authorities should periodically monitor Foreign Debt and Porfolio Investment. This would enable regulators to assess risks more effectively, such as leverage and interconnectedness, and enhance overall monitoring and risk management.

This study investigates the dynamics of capital inflows and their implications for corporate financial stability using data from publicly listed firms. Consequently, the findings may not fully represent the conditions of the entire corporate sector. In addition, the external debt analysis is confined to corporate external debt. To enhance the research potential, the study employs a micro-panel dataset covering the performance of 523 listed companies in Indonesia. This dataset allows for more granular extensions of the analysis, including differentiating corporate performance across sectors and ownership structures (state-owned enterprises versus private firms). Beyond these analytical enhancements, future research could also expand the sample to include large non-listed corporations, for which firm-level banking data are available.

7. DECLARATIONS

7.1. About Authors

Hesti Werdaningtyas (HW) https://orcid.org/0009-0001-2208-7544

Noer Azam Achsani (NA) https://orcid.org/0000-0002-1478-8586

Anny Ratnawati (AR) -

Tony Irawan (TI) https://orcid.org/0000-0002-1980-0812

7.2. Author Contributions

Conceptualization: NA; Methodology: HW and TI; Software: TI; Validation: HW and TI; Formal Analysis: HW and AR; Investigation: HW; Resources: TI; Data Curation: HW; Writing Original Draft Preparation: HW; Writing Review and Editing: NA and AR; Visualization: AR and NA; All authors, HW, NA, AR, and TI, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7.4. Funding

We are grateful to the Department of Economics, School of Business, IPB University, as well as to Muhammad Fazri and Adelia Oktarina from the National Research and Innovation Agency, for their technical support and substantial advice on this paper.

7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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