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Submitted: 20 December 2024, Revised: 27 July 2025, Accepted: 20 August 2025

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Policy & Governance Review
ISSN 2580-4820

Vol. 9, Issue 3, pp. 350-365
DOI: <https://doi.org/10.30589/pgr.v9i3.1195>

Macroeconomic Risk, Idiosyncratic Risk, and Corporate Leverage: Policy Implications for Financial Governance in Indonesia

Abstract

This study examines the influence of macroeconomic and firm-specific risks on the leverage of publicly listed Indonesian manufacturing and non-financial service firms. It also breaks down the divergence between sectors of risk responsiveness, which, in the capital structure literature for emerging markets, remains mostly uninvestigated. Using a sample of 99 publicly listed firms on the Indonesia Stock Exchange (IDX) from 2010 to 2019, we apply an Instrumental Variable (IV) and system-GMM estimator to control for endogeneity. The findings suggest that increasing macroeconomic risk and reducing firm-specific risk induces leverage, especially among service firms. These results also have policy implications for guiding firms in aligning their finance strategies to the sectoral risk they face and for assisting in formulating tailored policies that maintain robustness in the form of financial industry stability and corporate growth.

Keywords:

Leverage; macroeconomic risk; idiosyncratic risk; EBIT volatility; inflation volatility; system-GMM

Introduction

The leverage decisions of a corporation are central to its financial policy, and they affect the ability of the firm to grow, invest, and survive cyclical downturns. These choices have a huge impact on firm value, the cost of capital, and long-term survival (Myers, 2001; Frank & Goyal, 2009). Korteweg (2010) finds that leverage indeed

affects factor productivity. These choices are influenced by both macroeconomic risks (to which the corporation is exposed, such as inflation and financial uncertainty) and firm-specific risks (to the extent of earnings volatility and the severity of sensitivity to business cycles). Despite substantial research on leverage determinants, we have limited knowledge on how

macroeconomic and firm-specific risks impact leverage differently across industries, especially in an emerging economy context such as Indonesia.

It is important for both local entrepreneurs and policymakers to know how firms change their capital structures under risk at home. Although there have been studies that looked into the determinants of leverage, there are only a few that consider the risk factors that connect macroeconomic and specific risks connected with a company on leverage with the prospective varying sector in emerging markets such as Indonesia. We fill this gap by comparing the risk sensitivities of manufacturing and service enterprises.

However, the literature on capital structure and dynamics of risk still lacks consideration of sectoral differences in risk sensitivity, and this seems to be a limitation of the existing literature, especially in the Indonesian context. Relatively, service firms in developed economies are more susceptible to macroeconomic shocks and more dependent on short-term financing, in contrast to manufacturing firms that are more financially stable (Caglayan & Rashid, 2014). However, no systematic research has been conducted on the presence of such patterns in Indonesia.

Previous studies in Indonesia (Yudanto & Setiawan, 1998; Elok, 2017) have shown that macroeconomic factors influence company performance, particularly in resource-based and export-oriented corporations. However, relatively little attention has been paid to how macroeconomic and firm-specific risks influence capital structure decisions. This study attempts to bridge this gap by addressing two important research questions. (1) What is the impact of macroeconomic and firm-specific risk on corporate leverage in Indonesia? (2) Are these effects heterogeneous between the manufacturing and service industries?

These two industries were chosen because of their unique features and the recent growth of the service sector. By connecting sector-specific financial behavior to public policy implications, this study offers new empirical evidence on the capital structure used in emerging markets. These results may assist Bank Indonesia and OJK in implementing industry-based credit and risk management policies. Finally, the findings of this study assist firms in designing efficient financing policies and have regulatory implications for policymakers.

Studies of Capital Structure, Macroeconomic and Firm-Specific Risk Capital Structure Theories

Modigliani and Miller (1958), built the basis for capital structure theory as they developed the brilliant theory of, under perfect capital market, the value of the firm is irrelevant to its capital structure. This theory

has generated a great deal of academic interest and inspired empirical research on its violations in the real world. The literature emphasizes firm-specific factors affecting company leverage, such as profitability, firm size, tangibility of assets, and growth prospects reported by firms (Titman and Wessels, 1988; Rajan and Zingales, 1995). In an Indonesian context, Moosa and Li (2012) and Widarti and Sudana (2014) also observed these patterns indicating that the firm-specific factors have a substantial impact on the capital structure decision. Together, these studies emphasize the importance of internally driven factors in financing decisions.

Other studies have analyzed corporate capital structure changes in economic cycles. Hackbarth et al. (2006) and Levy & Hennessy (2007) that a firm's borrowing ability is a pro-cyclic phenomenon, given macroeconomic states. Moreover, industrial factors also play an essential role, as indicated by Larry and Silvia (2019), Hall et al. (2004), and De Jong et al. (2008).

Macroeconomic Risk and Company Leverage

The literature accepts that macroeconomic risks, such as inflation, interest rate risk, and general economic uncertainty, clearly determine firms' decisions regarding capital structure. These risk exposures are frequently realized through "financial fragility" effects, in which negative macroeconomic shocks impact the net worth of firms, thus hindering their ability to pledge collateral and increase the required risk premiums charged by external finance providers. Therefore, companies may react by modifying their borrowing behavior.

Gertler and Hubbard (1993) stress that macroeconomic risks are pervasive, and that firms can only partially insure idiosyncratic risks. They find that firms are more likely to issue equity than debt when macroeconomic volatility is high, so as not to pass on risk to debtholders. Bhamra et al. (2010) added more weight to this argument

by showing that changes in macroeconomic conditions have a big impact on how firms fund themselves, to the extent that firms become more conservative in their leverage decisions when the economy is weak. This is one reason why leverage is pro-cyclical: lending goes up during booms and goes down during busts.

Other studies have shown how firms opportunistically react to increases in macroeconomic risk. Baum et al. (2010) offer empirical proof that firms reduce capital investments considerably with a high level of risk when financial constraints increase. Simultaneously, companies tend to accumulate cash reserves as a cushion against future shocks. Bartram (2002) also noted that liquidity is related to interest rate risk, another instance of the relationship between firm action and macroeconomic uncertainty.

The link between inflation risk and leverage is also a specific concern. Hatzinikolaou et al. (2002) show further that changes in inflation have a statistically negative impact on the level of corporate debt. Similarly, Baum et al. (2009) find that high macroeconomic volatility forces the short-term leverage of many U.S. non-financial firms to a much lower level. Caglayan and Rashid (2014) extended this analysis to both public and non-public manufacturing firms in the U.K., concluding that firms become more cautious about financial distress and thus reduce their borrowing during volatile economic periods.

Taken together, these studies underscore the importance of incorporating macroeconomic risk into corporate financing analysis. While previous research has mostly focused on developed economies, our findings suggest that firms across different contexts may respond to macroeconomic uncertainty in comparable ways. However, the degree of response may vary based on market maturity and institutional framework. This study aims to build on that foundation by examining the Indonesian context, where macroeconomic

volatility remains a prominent feature of the business environment

Idiosyncratic (Firm-Specific) Risk and Company Leverage

The relationship between firm-specific risk and leverage has been widely studied and has yielded mixed and sometimes contradictory results. Some researchers argue that increased business risk, typically proxied by cash flow or earnings volatility, increases the likelihood of financial distress or bankruptcy. Consequently, firms with high volatility may choose to minimize their use of debt to avoid the higher costs associated with default. Titman and Wessels (1988) observed a negative relationship between earnings volatility and leverage, a finding reinforced by Crutchley and Hansen (1989), who found that income volatility significantly reduces corporate leverage in U.S. manufacturing firms. Similarly, Baum et al. (2009) demonstrate that idiosyncratic risk has a significantly negative effect on optimal short-term leverage, particularly for highly leveraged and smaller non-financial firms. MacKie-Mason (1990) also reported that firms facing greater uncertainty are less likely to use debt in their capital structure.

However, other studies have presented different results. Wald (1999), for example, found no consistent relationship between firm-specific risk and leverage across countries, with U.S. and German firms showing some sensitivity while firms in France, Japan, and the U.K. exhibited little to no impact. These findings suggest that the institutional context and market structure may moderate the relationship between risk and capital structure.

In contrast to negative or inconclusive findings, a third group of studies reported a positive association between firm-specific risk and leverage. Wu and Chiou (1992) found that firms may increase debt levels as business risk rises, possibly as a mechanism to reduce agency

costs and discipline management. Ramirez (1991) suggested that while business risk initially discourages borrowing, beyond a certain leverage threshold, firms with higher risk might continue to accumulate debt. Mueller (2008) argues that firms facing high idiosyncratic risk may find equity issuance prohibitively costly, prompting them to turn to debt financing instead. Supporting this, Heyman et al. (2008) find that smaller private firms in Belgium, particularly those facing higher credit risk, tend to rely more on short-term borrowing.

These divergent findings highlight the complexity of understanding the sensitivity of leverage to firm-specific risk. The inconsistency across countries, firm sizes, and methodological approaches underscores the need for context-specific research. This study contributes to this discourse by examining the case of Indonesia, an emerging economy with its own institutional characteristics and financial constraints.

Methods

Data Collection

This study is based on secondary data collected from the financial reports of listed manufacturing and non-financial service companies on the Indonesia Stock Exchange (IDX) from 2010 to 2019. Sample selection was performed according to specific inclusion criteria to maintain the homogeneity and integrity of the dataset. The selection mechanism is in line with the typically applied criteria-based filtering in empirical corporate finance studies on panel data (Baum et al., 1995; Baum et al., 2009). This approach is often referred to as non-random sample selection rather than purposive or judgment sampling, which is typically used in qualitative or interview-based research.

The companies included in this study met the following criteria.

1. Manufacture and non-financial services companies were listed on the Indonesia Stock Exchange (IDX) in 2010 – 2019.

2. Companies categorized under the mainboard index.
3. Companies with full and continuous sets of financial factors for the synthetic years 2010–2019.

The following is a summary of the sample selection process based on these criteria.

Table 1.
Sample Selection Process Based on Criteria

No	Criteria	Quantity
1	Companies listed on the Indonesia Stock Exchange	689
2	Companies excluded from the manufacturing and service (non-financial) sectors listed on IDX (2010–2019)	(114)
3	Public manufacturing and service (non-financial) companies not included in the main board index	(333)
4	Public manufacturing and service (non-financial) companies with data unavailable on CapitalIQ.com	(143)
Total sample meeting criteria		99
Observation years per sample		10

Source: Processed by Author

Non-financial firms are analyzed, and the financial sector is omitted from this work because the operational nature of a financial firm is fundamentally different from that of a non-financial firm. Their leverage ratios also tend to reflect liquidity needs, rather than ordinary corporate financing choices. This would bias the analysis since the capital structure's decisions taken by such companies are only partially equal to those of manufacturing and service firms. This methodology is consistent with previous empirical studies of leverage, which generally omit financial firms to ensure the consistency and comparability of results (e.g., Rajan and Zingales, 1995; Frank and Goyal, 2009).

The study sample is 99 manufacturing and non-financial service companies, out of a population of 575 companies on the Indonesia Stock Exchange (IDX) covering 12 months of the accounting period and classified in the main board index. Following the

application of these selection criteria, 99 companies met the sampling criteria, and we formed a sample of 990 observations from 2010 to 2019. Panel data are employed in this study, which combines cross-sectional data from the company level with scenario data borrowed annually.

Panel data enable the separate estimation of individual company characteristics and time-specific effects. Furthermore, it allows for simultaneous assessment of individual attributes while capturing the temporal dynamics of each variable included in the study (Mahyus, 2016). The use of panel data minimizes bias as it facilitates the identification of changes within single-equation models that combine both time-series and cross-sectional data.

The primary objective of this study is to analyze the impact of macroeconomic risk and firm-specific risk on the debt ratio (leverage) in both manufacturing and service industries.

Research Variables and Operational Definitions

Table 2.
Research Variable

No	Variable	Reference	Operasional Definitions
Dependent Variable			
1	Leverage	Caglayan & Rashid (2014)	Ratio of short-term debt to total assets.
Independent Variables			
2	Firm-Specific Risk	Cahyono & Chawla (2019)	Volatility of EBIT normalized by total assets, representing fluctuations in firm earnings.
3	Macroeconomic Risk	Hatzinikolaou et al. (2002)	Volatility of inflation, where higher standard deviation indicates greater risk.
Control Variables			
4	Revenue	Caglayan & Rashid (2014)	Ratio of total revenue to total assets.
5	Investment	Caglayan & Rashid (2014)	Ratio of fixed asset investments to total assets.
6	Cash	Caglayan & Rashid (2014)	Ratio of cash and cash equivalents to total assets.

Source: Processed by Author

Research Model

To examine the impact of risks on the leverage of publicly listed manufacturing and service (non-financial) companies, the following model was employed:

$$Lev_{it} = \lambda_0 + \lambda_1 Lev_{it-1} + \lambda_2 Sales_{it} + \lambda_3 Cash_{it} + \lambda_4 Inv_{it} + \lambda_5 \sigma_{it-1}^{firm} + \lambda_6 \sigma_{it-1}^{macro} + \lambda_7 \sigma_{it-2}^{macro} + f_i + \varepsilon_{it} \quad (1)$$

Where,

- Lev : Ratio of short-term debt to total assets for company i in year t .
- Lev_{it-1} : Level of leverage of company i in the previous year.
- $Sales_{it}$: Sales-to-assets ratio.
- $Cash_{it}$: Cash-to-assets ratio
- Inv_{it} : Fixed asset investment-to-assets ratio
- σ_{it-1}^{firm} : Company Specific Risk (Idiosyncratic Risk)
- σ_{it-1}^{macro} : Macroeconomic Risk
- f_i : Company Fixed Effect
- ε_{it} : error term

The next estimation uses a modified model to test the differences in leverage sensitivity to risk between publicly listed manufacturing companies and non-financial service companies.

$$Lev_{it} = \phi_0 + \phi_1 Lev_{it-1} D_i^{mfr} + \phi_2 Lev_{it-1} D_i^{js} + \phi_3 Sales_{it} D_i^{mfr} + \phi_4 Sales_{it} D_i^{js} + \phi_5 Cash_{it} D_i^{mfr} + \phi_6 Cash_{it} D_i^{js} + \phi_7 Inv_{it} D_i^{mfr} + \phi_8 Inv_{it} D_i^{js} + \phi_9 \sigma_{it-1}^{firm} D_i^{mfr} + \phi_{10} \sigma_{it-1}^{firm} D_i^{js} + \phi_{11} \sigma_{it-1}^{macro} D_i^{mfr} + \phi_{12} \sigma_{it-2}^{macro} D_i^{mfr} + \phi_{13} \sigma_{it-1}^{macro} D_i^{js} + \phi_{14} \sigma_{it-2}^{macro} D_i^{js} + \varepsilon_{it} \quad (2)$$

Where,

- (D_i^{mfr}) : Dummy variable for manufacturing firms.
- (D_i^{js}) : Dummy variable non-financial service

The non-financial service dummy equals one if the company is categorized as a non-financial service company, and zero otherwise.

Estimation Techniques

Since f_i captures the effects of unobserved, time-invariant firm-specific factors in Equation 1 that may correlate with the regressors in the model, using ordinary least squares (OLS) would produce biased results. Additionally, coefficient estimates would become inconsistent due to the correlation between the lagged dependent variable and f_i . Although the instrumental variable (IV) approach can produce consistent coefficients in the absence of serial correlation, the estimates may be inefficient because the IV estimator utilizes only a subset of the available moment conditions.

The GMM technique offers an effective solution to the outlined issues by utilizing all linear moment conditions specified by the model. One of its key advantages is its robustness to non-normality of the dependent variable (Blundell and Bond, 1998). Additionally, the GMM estimator incorporates additional instruments during the estimation. According to Antoniou et al. (2006), if the residuals (ε_{it}) are not serially correlated, the first-differenced residuals ε_{it} are likely to be orthogonal to historical values of the dependent and explanatory variables. Consequently, second and higher lags of these variables can be used as valid instruments for ε_{it} .

Although the Arellano-Bond difference GMM estimator is superior to many other estimation methods, it is prone to issues with weak instruments. To mitigate this, Arellano and Bover (1995) recommend using first-difference instruments for level equations and level instruments for first-differenced equations. Blundell and Bond (1998) further proposed that including lagged first differences and levels in the instrument set can reduce potential sample bias.

The system GMM approach effectively handles individual heterogeneity while

maintaining variation across firms. This is achieved by estimating the model at both levels and first differences using lagged differences as instruments for level equations. Moreover, diagnostics such as the Arellano-Bond test for autocorrelation and the Hansen J-statistic test for instrument validity will be employed to ensure the robustness and reliability of the estimation results.

The main hypothesis of this study is that an increase in risk in the previous period has a significant and negative effect on corporate debt usage, and the impact of previous-period risk on leverage will differ between the two sectors.

Results and Discussion

Descriptive Analysis

The data were sourced from the financial statements of publicly listed companies on the Indonesia Stock Exchange (IDX). These financial statements can be accessed through the IDX website as well as via CapitalIQ for additional financial data.

We note that the average leverage of service firms is greater than that of manufacturing firms.

This finding is understandable since debt is the main source of external financing for service firms. It is also observed that service firms' leverage has greater variance than that of manufacturing firms.

Moreover, there is a large difference in the sales-to-total assets ratio between the manufacturing and service industries. The mean of sales to total assets is 1.131 for manufacturing firms, and 0.09 for service firms. This ratio is also much more volatile for manufacturers than for service firms.

The levels of cash and cash equivalents to total assets do not vary greatly between the two. The average cash-to-total assets ratio for manufacturing companies is 11.3 percent, whereas that for service companies is 11.6 percent. Moreover, manufacturing firms generally have a higher level of investment than service firms.

Estimation Results – Leverage of Publicly Listed Companies

The next step in the analysis is to evaluate the influence of firm-specific and macroeconomic risks on the leverage of publicly listed manufacturing

Table 3.
Descriptive Statistics

Variable	Company	Statistic				
		Obs	Mean	Std. Dev.	Min	Max
Leverage Ratio	All	990	0.306	0.171	0.013	1,093
	Manufacturing	490	0.289	0.155	0.27	0.706
	Service	500	0.323	0.185	0.013	1,093
Sales Ratio	All	990	1,039	0.749	0.008	5,407
	Manufacturing	490	1,131	0.925	0.008	5,047
	Service	500	0.95	0.493	0.332	3,105
Cash & Equivalent Ratio	All	990	0.115	0.103	0.001	0.632
	Manufacturing	490	0.113	0.116	0.001	0.632
	Service	500	0.116	0.088	0.001	0.445
Fixed Assets Investment Ratio	All	990	0.05	0.046	0.001	0.336
	Manufacturing	490	0.057	0.045	0.001	0.291
	Service	500	0.044	0.047	0.001	0.336
Idiosyncratic Risk	All	990	0.01	0.013	0.0003	0.2469
	Manufacturing	490	0.009	0.007	0.001	0.077
	Service	500	0.01	0.016	0.001	0.247
Macroeconomic Risk		990	0.1798	2:47	1,348	9,906

Source: Conducted by author using STATA 15, 2021

Table 4.
Result of Model 1

Variable	Coefficient (Std. Error)
levt1	0.400*** (0.0626)
sales	0.0652*** (0.0167)
cash	-0.240*** (0.0667)
inv	-0.0431 (0.110)
riskfirm	1.206*** (0.397)
riskmacro_L1	0.000203 (0.000870)
riskmacro_L2	-0.00196* (0.000994)
Constant	0.135*** (0.0228)
Diagnostic Test	
Observation	988
Companies	99
AR(2)	1.58
p Value	0.114
J-statistics	44.3
p Value	0.09

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

and non-financial service companies in Indonesia. This model is estimated using the Generalized Method of Moments (GMM) as it includes a lagged dependent variable among its explanatory variables.

The estimation results yield some interesting implications for the determinants of leverage and the effects of firm-specific and macroeconomic risks. The positive and significant value of the coefficient of SBLCT-1 at the 1 percent significance level indicates the long-run nature of leverage decisions. The existence of this persistence effect suggests that companies do not like to move from their borrowing patterns, and the lagged value of leverage has an effect. This is consistent with the hypothesis that firms do not engage in routine capital structure changes because of adjustment costs or signalling reasons.

Concerning firm-level variables, the sales-to-assets ratio is found to be positively and significantly

related to leverage. This relation implies that more sales imply more borrowing, and this could be due to the fact that good sales performance tends to have more access to external finance and is able to negotiate better borrowing terms (prices etc.), for instance, lower interest costs.

This is in agreement with the findings of Bambang et al. (2018) for firms in Southeast Asia, but differs from Caglayan and Rashid (2014), who found a negative relationship for UK firms; that is, higher sales imply lesser utilization of external debt. Furthermore, the cash-to-assets ratio plays an important negative role in explaining leverage, suggesting that firms with more cash holdings have less dependence on external debt financing. These companies have a preference for self-finance rather than external funding, which minimizes their leverage level. Investment, on the other hand, is not significant at the 1% level, indicating that, in this setting, investment spending debt capacity is unlikely to be crucial in a leverage choice decision.

The author further find that the effects of risks on leverage depend on the leverage level; idiosyncratic risks and macro risks have different effects. Firm-level risk (EBIT volatility) influences leverage positively and significantly. This result implies that firms that experience more internal earnings volatility are more likely to take on more debt. This may be indicative of firms trying to plow stability or satisfy financial commitments as there is a period of uncertainty. However, the same is not true for macroeconomic risk. The former is non-significant, but the latter is negative at the 10% level.

This finding suggests that companies react to macroeconomic uncertainty with a lag, and over time, they lower their leverage as macroeconomic uncertainty rises. Such conduct indicates that firms decrease their risk of avoiding financial distress during periods of macroeconomic risk. This evidence is consistent with other investigations such as Gertler and Hubbard

(1993), Hatzinikolaou et al. (2002), Bhamra et al. (2010), Baum et al. (2009), and Caglayan and Rashid (2014), who find that macroeconomic uncertainty has an adverse effect on leverage.

In summary, we find that leverage decisions are determined by past borrowing, firm-specific drivers, such as sales intensity and cash holdings, and differently acting risks. Although firm-specific risk tends to motivate firms to have more debt in times of uncertainty, macroeconomic risk causes them to deleverage as a preventive action. These results help us understand precisely how both manufacturing and service firms react to different types of risks when designing their capital structures.

Estimation Results – Different impact of risks on both sectors

For both sectors, lagged leverage is positive and statistically significant at the 1% level, confirming the findings of the base model. The coefficient for service industry firms is much larger than that for manufacturers, indicating that leverage is more persistent in service industry firms. Taken together, these findings suggest that, compared with manufacturing firms, service firms are more dependent on ST debt to support daily operations, and thus are less likely to make concessions for the use of short-term debt.

Prior to estimating the effects of risks on leverage in the two sectors, we consider the effects of firm-specific variables. The results show that the salesto-assets ratio exerts a positive influence on leverage in both groups, but is significant at 10 % for manufacturing firms and at 5 % for service firms. The larger coefficient and greater level of significance for service firms imply that service firms can afford to take advantage of the opportunity to raise short-term debt when sales are high. This is consistent with previous results that higher sales increase firms' external financing access and the ability to acquire superior borrowing conditions, such as lower interest rates.

Table 5.
Result of Model 2

Variable	Coefficient (Std. Error)
Levt1_mfr	0.417*** (0.111)
Levt1_js	0.509*** (0.138)
Sales_mfr	0.0563* (0.0320)
Sales_js	0.0668** (0.0261)
Cash_mfr	-0.266*** (0.0621)
Cash_js	-0.107 (0.0805)
Invt_mfr	0.344 (0.141)
Invt_js	-0.212 (0.148)
RiskFirm_mfr	-0.0881 (0.624)
RiskFirm_js	1.204** (0.462)
RiskMacro_mfr_L1	0.000547 (0.00129)
RiskMacro_mfr_L2	0.557 (0.617)
RiskMacro_js_L1	-0.000984 (0.00110)
RiskMacro_js_L2	-0.00373** (0.00151)
Constant	0.121*** (0.0286)
Diagnostic Test	
Observation	988
Companies	99
AR(2)	1.62
p Value	0.105
J-statistics	69.09
p Value	0.542

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

In the case of the cash-to-assets ratio, the findings indicate a negative impact on leverage, which is significant at the 1% level for the entire sample and significant at the 1% level in the case of manufacturing firms. This implies that a boost in cash holdings allows production firms to finance their activities using a lower debt ratio. Conversely, the negative impact is not significant for service companies, which implies that service

firms have a higher dependency on internal financing but cannot effectively reduce borrowing as manufacturers.

Investigating the impact of idiosyncratic and macroeconomic risks on leverage, a striking sectoral divergence was identified. Macroeconomic risk has a negative and significant impact on leverage in service firms at the 5% level but is not significant for manufacturing firms. This result may indicate that service firms prefer a more conservative financial policy by delevering macroeconomic uncertainty. This result is in accordance with the results of Caglayan and Rashid (2014).

On the contrary, idiosyncratic risk has a significant impact only for service firms at the 5% level and is insignificant for manufacturing firms. This means that service firms react to firm-specific risk, in our case EBIT variability, by raising more debt, perhaps to smooth operations/for working capital purposes. However, manufacturing companies seem to be less responsive to their individual firm-related risks in order to their determining leverage.

To summarize, the findings underscore the key distinctions between the two sectors. Service firms have higher leverage persistence, higher idiosyncratic and market risk sensitivities, and are more sensitive to business risk compared to manufacturing firms; the latter are also more sensitive to cash levels, lowering their reliance on debt with additional levels of cash. This difference is due to the contrasting financing models and risk policies of the firms in the two industries.

Conclusion

The study reveals separate impacts of macroeconomic and idiosyncratic risk and sectoral variation in the leverage sensitivity of Indonesian firms as its main findings. Macroeconomic risk has a negative effect on financial leverage, which is attributed to firms adjusting their leverage during times of high macroeconomic uncertainty

to alleviate financial distress. Conversely, idiosyncratic risk is positively associated and firms tend to add short-term debt if they are exposed to higher EBIT risk, possibly reducing their operating growth. These sectoral differences are substantial because the sensitivity of service firms to macroeconomic and idiosyncratic risks is greater than that of manufacturing firms in Indonesia. A high level of idiosyncratic risk makes it necessary for service firms to issue more short-term debt, whereas an elevated level of macroeconomic risk induces service firms to hedge risk by decreasing leverage in an attempt to stabilize the financial structure.

In addition, the study addresses the contribution of leverage persistence and the effect of the differences between firms. Past leverage has a strong effect on leverage in the current period, showing a remarkable persistence. Company-specific determinants (i.e., sales, cash holdings, and fixed asset investments) have heterogeneous effects on leverage choices. Higher sales are related to a higher use of short-term debt, and cash levels reduce dependence on debt. However, leverage was not significantly affected by FAIs. These results highlight the role of exogenous risk factors and endogenous financial management in leverage strategies across the sections.

Recommendations

Firms must focus on internal and external considerations to determine their capital structures. The internal factors are the benefits and costs of debt, industry characteristics, and firm risk, and they contribute to the process of decisions. There is also a need to consider the relevance of other external factors, such as macroeconomic issues (inflation, interest rates, and fiscal and monetary situations), as they can greatly influence the results of these operations. Companies also need to attempt to approach an optimum level of debt by conducting a full analysis of the long-run profitability of using debt

versus other sources of finance. They also need to examine the possible risks of fiscal stress that derail growth and stability.

Likewise, enhancing financial flexibility is a piece of advice to make it through economic uncertainty. Businesses can also achieve this by stockpiling cash for unexpected working capital needs and diversifying funding sources to reduce reliance on short-term installment debt. This is a strategy that businesses are adopting, so they will be better positioned to address financial issues, minimize risk while maximizing the potential for reward, and be positioned for stability regardless of economic conditions.

Policymakers and financial regulators can play a significant role in shaping corporate leverage decisions and the systemic stability of financial markets. For instance, great management of long-term leverage would have been done by Bank Indonesia (BI) in strategic control of credit. In better times, loosening credit rules can help kick-start construction, while others require beneficial financing and investment. By contrast, when macroeconomic risk is high, the growth of leverage may be slowed to a level below equilibrium by the rise in credit tightness, which reduces systemic risk. This 'procyclical' method ensures that demand for credit will correspond with the cycle on which the economy is placed and thus help to sustain growth and stability.

These initiatives can be further supported through purposed regulations to cater to firm-specific sensitivities in capital structure decisions by the Financial Services Authority (OJK). For instance, providing tax breaks to firms that emphasize cash efficiency in their capital structures may lead to financial diligence. Similarly, creating policies to limit the risk exposure of highly leveraged firms can also help prevent defaults, especially during economic downturns. These proactive regulations serve not only to stabilize individual firms but also to decrease systemic financial risk.

In addition, the Ministry of Finance (Kemenkeu) and Bank Indonesia have suggested adopting macroprudential monetary and fiscal policies while managing macroeconomic risks. Interest rate reduction for service-dominated sectors that are hard-hit by macroeconomic fluctuations will alleviate financing stress and support the survival of firms. Furthermore, credit support programs, including interest subsidies or industry-specific incentives, may offer liquidity to firms in adverse market scenarios. These actions are necessary to help keep capital flowing and support disruptions in economic activity resulting from this negative shock.

Strengthening internal corporate risk monitoring is crucial for improving financial stability. OJK and commercial banks can increase monitoring by tightening the credit exposure limit for companies with high fluctuations in financial performance. Furthermore, the use of more sophisticated risk assessment models driven by data can allow regulators to better recognize high-risk firms, making interventions to avoid distress more effective. Such a granular approach allows regulations to be targeted and effective.

Finally, the KSSK can pursue industry-specific credit policies in response to the diverging sensitivities of industries to macroeconomic risks. For example, the service sector would be well-served with customized credit arrangements to help ride out uncertainty. Simultaneously, manufacturing industries, with their ability for funding diversification, could benefit from broader financing options for their expansion and innovation. "Properly adjusted credit policies based on sector-specific considerations can construct a more balanced and robust industrial ecosystem, where no one industry bears a disproportionately high risk of economic fluctuations," the release added.

Research Limitations

This study employs inflation volatility as an alternative macroeconomic risk

measure. Nevertheless, using other proxies for macroeconomic risk as a criterion would offer a more thorough insight, as a different proxy may reflect other aspects of the impact magnitude. By way of illustration, Caglayan and Rashid (2014) used two alternative macroeconomic risk proxies and discovered that not only were they both significantly and negatively related to leverage but also that the influence of the two proxies was not necessarily the same.

Possible proxies for macroeconomic risks are the volatility of the BI and Fed rates. The domestic monetary policy uncertainties implied by BI rates directly affect Indonesian borrowing and credit availability. The Fed rate also affects international capital flows and external financing conditions, and its variability reflects the uncertainties in international markets. This would enable us to obtain a more comprehensive picture of leverage sensitivity to monetary policy risks, provide a more in-depth understanding of sectoral heterogeneity, and make the results more robust.

Another limitation is the amalgamation of all production and service sectors in this research. The sectors of these industries have different financial natures, which may lead to different moderation of firm-specific determinants and macroeconomic risks on leverage. Widarti and Sudana (2014) exemplify this by examining manufacturing subsectors, where some firm-specific variables affect leverage differently in certain subsectors. This implies that macroeconomic risk may have different impacts on leverage in the subsector.

Ibnu (2017) observed a bidirectional relationship between financial leverage and the systemic risk ISS of firms listed on the Indonesia Stock Exchange (IDX). However, they only considered the impact of macroeconomic risk on financial leverage at the industry level. It may be interesting to investigate, in the future, how the effect of systemic risk varies across industries due to this limitation. Moreover, further research could delve deeper at the sectoral level to see how specific subsectors in the

industry react to systemic risk. This would provide a deeper and more nuanced understanding of the relationship between leverage and systemic risk.

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