

# Credit Risk Analysis of Indonesia Nickel Industry from Bank Financing Perspective

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## Abstract

At the beginning of 2023, local banks observed increased demand for loan facilities to finance the purchase of new nickel transportation vessels, such as tugboats and barges. Loan repayments are expected to come from payments made by mining companies to shipping companies, underscoring the urgent need for a comprehensive credit risk analysis of Indonesia's nickel industry. Research found that market risk of nickel is highly influenced by China, the largest buyer, driven by demand from the stainless-steel industry and the rapidly expanding EV industry. Commodity risk analysis shows from 2018 to 2023, nickel prices exhibited annual volatility of 50%. A stress test indicated that if nickel prices dropped to USD 13,011.50/ton, companies would be unable to meet debt obligations. Financial risk analysis shows in year of 2022 both ANTM and INCO recorded good financial conditions with healthy profit margin and decent financial ratio including CR (above 1.0 times), DER (below 220%), and DSCR (above 1.0 times).

**Keywords:** Credit Risk, Indonesia Nickel Industry, Commodity Risk, Market Risk

## 1. Introduction

The rising demand for nickel in last few years, which has significantly boosted the need for barge transportation services, has prompted shipping companies in Indonesia to acquire new vessels for nickel transport. This trend has, in turn, led to a surge in investment loan applications to local banks for financing the construction or purchase of these vessels.

Investment loan facilities for vessel purchases by shipping companies are typically provided for terms ranging from three to seven years. The loan repayments are funded through payments received from nickel transportation services rendered by shipping companies to mining companies. Consequently, it is crucial to analyze the business performance and associated risks of nickel mining companies operating in Indonesia, as they serve as the primary source of loan repayment.

Global nickel market experiences significant price volatility from 2018 to 2023 driven by supply-demand dynamics, geopolitical factors, and evolving global policies on green energy. These fluctuations have a direct impact on the profitability and financial stability of businesses in the nickel industry. For this reason, banks must carefully assess the performance of companies in the sector to avoid financing businesses with declining profitability or unsustainable operations.

Moreover, tugboats and barges require substantial investments. Loans for such assets involve high amounts and long-term repayment periods. Without assessing the creditworthiness and business prospects of the borrower, banks risk defaults that could result in significant financial losses.

Indonesia has the largest nickel reserves globally (Yoesgiantoro et al., 2022). Mining locations are in several regions; Central Sulawesi, South Sulawesi, South-East Sulawesi, North Maluku, Maluku, Papua

and West Papua. Nickel ore is transported by sea to smelter plants located in Banten, North Maluku, South Sulawesi, Central Sulawesi and South-East Sulawesi. Smelter plants are usually located on seashore and already equipped with special port.

According to Irwandy Arif (2023), Indonesia is home to eleven major nickel mining companies. However, only a few Indonesian nickel mining companies are publicly listed at the Indonesia Stock Exchange (IDX). This limited listing creates challenges in evaluating the business performance of the Indonesian nickel industry due to restricted access to annual financial reports.

The business performance of Indonesian nickel mining companies is regarded as a representative indicator of the overall performance of the country's nickel industry. Therefore, analyzing the performance of these companies provides a comprehensive overview of the industry. The findings from this analysis will serve as a critical reference for making informed decisions regarding the provision of loan facilities.

By analyzing the credit risks tied to the nickel industry's business performance, banks can identify potential risks early. This approach helps mitigate the likelihood of loans turning non-performing, thereby protecting the bank's financial stability and ensuring sustainable lending practices.

## 2. Literature Review

David Humphreys (2018) predicted a significant shift in the mining industry's customer base towards Asia. This transition would mark a departure from the previous dominance of developed countries, which consumed approximately half to two-thirds of the world's minerals, to a scenario where emerging economies account for three-quarters of global mineral consumption. China, the largest mineral consumer, is at the forefront of this shift, consuming nearly half of the world's minerals. Furthermore, the widespread adoption of electric vehicles is expected to dramatically increase the demand for materials in the transport sector by 350–700% between 2015 and 2050, driven primarily by rising requirements for copper, silver, nickel, lithium, cobalt, and steel (Watari et al., 2019).

Lu et al. (2023) highlighted that Indonesian nickel products play a pivotal role in the global supply of nickel components, making any cost fluctuations in Indonesia a significant factor for the overall cost structure of nickel products. The gradual implementation of Indonesian nickel policies could lead to a moderate increase in the prices of related nickel products. Additionally, Ma et al. (2022) found that the stability of the global nickel ore trade network is highly sensitive to potential disruptions in key

trading and producing countries, such as Indonesia, the Philippines, and South Africa.

The price of nickel on the London Metal Exchange (LME) has been highly volatile, with Indonesian government policies being a significant influencing factor (Lim et al., 2021). Notably, Indonesia's export bans on nickel ore in 2014 and 2019 appeared to drive up LME nickel prices, causing considerable disruption in the LME nickel market.

Several Indonesian publicly listed companies have obtained credit ratings from independent rating agencies such as S&P, Moody's, and Fitch. However, it is important to distinguish between credit rating and credit risk. A credit rating serves as a comparative measure, assessing which borrower is more likely to meet their obligations (Weissova et al., 2015). While credit ratings are valuable tools for evaluating credit risk, they represent only one aspect of comprehensive credit risk measurement.

According to Indonesian Financial Services Authority Regulation Number 18/POJK.03/2016 on the Implementation of Risk Management for Commercial Banks (2016), "Credit Risk is the risk due to the failure of other parties to fulfil obligations to the Bank, including credit risk due to debtor failure, credit concentration risk, counterparty credit risk, and settlement risk".

Indonesian Bankers Association (2015) recommended Five Pillars framework for identifying credit risk: the collateral pillar, management pillar, financial pillar, natural resources pillar, and business environment pillar. Conducting a thorough credit risk analysis is essential to understanding the nature of the risk, including its characteristics and severity. This process involves a detailed examination of uncertainties, risk sources, potential consequences, and the likelihood of occurrence.

## 3. Research Method

The study will involve the collection of both quantitative and qualitative secondary data from various sources, including related studies, journals, literature, government regulations, and companies published annual reports. The analysis will focus on the business performance of two public listed nickel companies in Indonesia: PT Vale Indonesia Tbk (INCO) and PT Aneka Tambang Tbk (ANTM). The annual reports of these companies from January 1, 2018, to December 31, 2022, will be examined.

### Financial Risk Analysis

- a. *Net Profit Margin (NPM)* measures the profitability of the company as the percentage of net profit a company obtains from revenue or sales.

- b. **Current Ratio (CR)** measures company's ability to pay short-term obligations or those due within one year, calculated by dividing total current assets by total current liabilities.
- c. **Debt to Equity Ratio (DER)** assesses company financial leverage and it is calculated by dividing its total liabilities by shareholder equity.
- d. **Debt to Service Coverage Ratio (DSCR)** evaluates company available cash flow to pay its existing debt commitments.

### Business Environment Risk Analysis

**Market analysis** examines global nickel market condition, including market size, growth potential and future trends.

**Commodity Risk** is analyzed by measuring the volatility of London Metal Exchange (LME) nickel prices in the period of 2018 to 2023.

**PESTEL analysis** is used to examine Indonesia nickel industry business environment from aspects of politics, economic, social, technology, environment and legal.

**Porter's Five Forces** will analyze the competitiveness of Indonesia nickel industry.

**Operational risk analysis** will assess risks that arise from internal processes, people, systems, and external events affecting the industry's performance

### Scenario Analysis

**Stress Test** is carried out using scenario if the price of LME nickel drops from the average nickel price in 2022 to calculate DSCR. The percentage of price drops derived from the result of price volatility calculation. It captures how the price drop affects repayment capacity of the company.

## 4. Results and Discussion

### Profitability Analysis

INCO and ANTM recorded increasing profit during period of 2018 to 2022, despite of Covid-19 pandemic. INCO revenue stream solely from nickel, while ANTM's comes from nickel, precious metal and bauxite. Both companies benefited from rising nickel prices and increasing demand of nickel.

TABLE I

NET PROFIT MARGIN (NPM)

COMPANY	2022	2021	2020	2019	2018
INCO	16.99%	17.39%	10.83%	7.34%	7.79%
ANTM	8.32%	4.84%	4.20%	0.59%	3.46%

### Liquidity Analysis

INCO and ANTM consistently recorded Current Ratio (CR) above 1.0 for five consecutive years, indicating strong liquidity, as their total current assets were sufficient to cover their total current liabilities.

TABLE II

CURRENT RATIO (CR)

COMPANY	2022	2021	2020	2019	2018
INCO	5.66	4.97	4.33	4.31	3.60
ANTM	1.96	1.79	1.21	1.45	1.54

### Leverage Analysis

Debt-to-Equity Ratio (DER) for both companies remained below 220% from 2018 to 2022, suggesting that neither company heavily relied on borrowed funds compared to internal resources for financing their operations.

TABLE III

DEBT TO EQUITY RATIO (DER)

COMPANY	2022	2021	2020	2019	2018
INCO	13%	15%	15%	14%	17%
ANTM	42%	58%	7%	67%	69%

### Repayment Capacity Analysis

Debt Service Coverage Ratio (DSCR) assesses a company's ability to meet its debt obligations with available cash flow. INCO maintained a DSCR above 1.0 throughout 2018–2022, demonstrating sufficient cash flow to cover debt commitments. In contrast, ANTM reported a DSCR below 1.0 from 2018 to 2020, signaling challenges in meeting debt obligations during those years, but showed significant improvement from 2021 to 2022.

TABLE IV

DEBT TO SERVICE COVERAGE RATIO (DSCR)

COMPANY	2022	2021	2020	2019	2018
INCO	93.48	94.90	65.04	53.40	5.30
ANTM	17.94	1.44	0.67	0.64	0.95

### Market Analysis

Over 70% of global nickel production is allocated to stainless steel manufacturing (Fahressi Fahalmesta, 2022). As of 2021, China, Indonesia, and India were the top producers of stainless steel worldwide. Meanwhile, global consumption of stainless steel is expected to remain dominated by China until 2030,

followed by other Asian countries, Europe, and the Americas. However, the production ratio is anticipated to shift due to the rapid growth in demand for lithium-ion (LiOn) batteries used in electric vehicles (EV). The share of nickel consumption for batteries is projected to rise sharply, reaching 31% of total nickel demand by 2026, a significant increase from 9% in 2021. Nevertheless, stainless steel industry was still projected to become primary driver of global nickel demand compared to EV.

### Commodity Risk Analysis

Nickel prices exhibited notable fluctuations between 2018 and 2023. Using daily historical data to measure volatility during this period, the following results were observed:

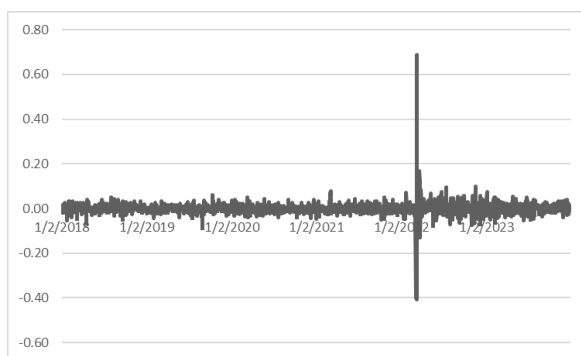


Figure 1: Nickel Price Volatility Period 2018 - 2023

The daily volatility from 2018 to 2023 stands at 0.03 (or 3%), while the annualized volatility rises to 0.50 (or 50%). This indicates a highly volatile commodity market, with significant price fluctuations. Key contributing factors include increasing global market demand, Indonesia's nickel ore export ban policy, and supply chain disruptions caused by the COVID-19 pandemic and the Russia-Ukraine conflict.

### PESTEL Analysis

#### a. Politics

Government of Indonesia policy of export ban was first implemented in January 2014. However, a temporary allowance permitted the export of nickel ore with concentrations below 1.7% between January 2017 and December 2019. From January 2020 onwards, all nickel ore exports were completely prohibited. This policy seeks to strengthen domestic processing capabilities, enhance the value chain of nickel within Indonesia, and drive job creation and economic growth across the country.

#### b. Economic

Indonesia's economic growth is projected to slow to 4.9% in 2023, with a relatively stable outlook over the medium term (World Bank, 2023). This moderation is

supported by robust private consumption as inflationary pressures ease. However, decreased domestic demand and investment are expected to lead to a moderation in imports during 2023. Additionally, export growth is anticipated to slow due to declining global demand and softening commodity prices.

#### c. Social

Nickel processing and refining development plan in Southeast Sulawesi Province has positively impacted income and social aspects. These benefits include increased job opportunities, improved income levels and welfare, and the development and expansion of community micro-enterprises (Tan, 2022).

#### d. Technology

Nickel ore export ban policy has encouraged development of nickel smelter plants that applied recent technology to process nickel, including smelting technology that process high-grade nickel ore (sapolite) to create ferronickel (FeNi), nickel pig iron (NPI), and nickel matte. Furthermore, there is in progress development of plant using leaching technology (hydrometallurgy) to transform low-grade nickel ore (limonite) into nickel sulfate compound.

#### e. Environment

Red floods caused by wastewater from a large nickel mining operation in Southeast Sulawesi have damaged farms and fishing grounds, further impacting local communities (Jacobson, 2023). Meanwhile, government of Indonesia had already imposed some mining regulations including Decree of the Minister of Energy and Mineral Resources Number 1827K/30/MEM/2018 concerning Guidelines for Implementing Good Mining Engineering Principles and Implementing regulation for Mining Law No. 4/2009, i.e. GR No. 78/2010 and MoEMR No. 7/2014 that regulated reclamations and post-mining activities for both IUP-Exploration and IUP-Production Operation holders.

#### f. Legal

Indonesia Law Number 3 of 2020 concerning amendments to Law Number 4 of 2009 concerning Mineral and Coal Mining regulates mining legal area, mineral and coal management plan, re-arrangement of permits in Mineral and Coal business and strengthening policies related to environmental management in mining business activities, including the implementation of reclamation and post-mining.

In 2022, government of Indonesia released Government Regulations in lieu of Law Number 2 of 2022 concerning Job Creation. This law is designed to regulate job creation efforts in Indonesia, addressing the challenges arising from intensified competition and economic globalization. Key areas addressed by this law include: enhancing the investment climate

and business activities, prioritizing employment generation, facilitating, protecting, and empowering Cooperatives and Micro, Small, and Medium Enterprises (MSMEs), streamlining business processes, promoting research and innovation, resolving land acquisition issues, developing economic zones, managing central government investments and expediting national strategic projects, improving government administration, and implementing and enforcing sanctions when required.

### **Porter's Five Forces Analysis**

#### **a. Threats of New Entrants – Medium**

The threat of new entrants includes the substantial capital requirements, access to resources, regulatory complexities, and the presence of established players with significant competitive advantages. The promising outlook of the nickel industry has drawn interest from well-capitalized companies. Many of these firms are pursuing strategic acquisitions of existing mining companies with valid Mining Business Permits (IUPs) or operational smelter facilities.

This approach enables new entrants to quickly establish or expand their presence in the sector by leveraging existing infrastructure and regulatory compliance, bypassing the challenges of starting operations from the ground up. Several public listed companies entering Indonesia nickel companies in 2023 were PT Harum Energy, Tbk (HRUM), PT Resource Alam Indonesia, Tbk (KKGI) and PT United Tractor, Tbk (UNTR).

#### **b. Bargaining Power of Buyer - High**

Under Indonesia's current nickel export ban, nickel can only be sold in processed forms such as nickel matte, ferronickel, Nickel Pig Iron (NPI), and Mixed Hydroxide Precipitate (MHP). The primary buyers of these products are the stainless-steel and EV battery industries. Global stainless-steel consumption remains dominated by China, giving it significant bargaining power as the largest consumer in the global nickel market. This dominance highlights China's critical role in shaping global nickel demand and influencing pricing dynamics.

#### **c. Bargaining Power of Supplier - High**

Indonesia possesses the largest nickel reserves globally and accounted for 30% of the world's nickel production in 2021 (Fahressi Fahalmesta, 2022). Indonesian nickel companies benefit from long-term mining concessions, ensuring a stable supply of nickel for the next 5 to 10 years. These advantages position Indonesia as a dominant supplier in the global nickel market, giving it high bargaining power in the supply chain.

#### **d. Threat of Substitute - Medium**

Nickel plays a vital role in stainless steel production by enhancing the alloy's corrosion resistance, ductility, and toughness. However, concerns about nickel ion release into the human body have spurred the development of nickel-free austenitic stainless steels for medical applications. These alloys use elevated nitrogen content as a substitute for nickel, which not only stabilizes the austenitic structure but also significantly improves the material's mechanical properties, making it suitable for medical use. There is possibility in the future of the substitution of nickel for medical stainless-steel industry

#### **e. Rivalry among Competitors – High**

As of 2020, Indonesia had 292 Mining Business License (IUP) holders and 4 Contract of Work (KK) companies supplying nickel to 11 operational smelters (Kementrian Energi dan Sumber Daya Mineral, 2020). This highlights the high level of competition among nickel companies in the country. Such competition can drive companies to focus on producing higher-quality products to differentiate themselves. However, it also creates opportunities for small-scale companies to be acquired by larger, well-capitalized firms, enabling consolidation and increased efficiency in the industry.

### **Operational Risk Analysis**

#### **a. Process Risks**

Process stage includes 3 (three) key factors: mining operation, processing and refining, and supply chain management.

##### *Mining operations*

Inefficiencies in nickel ore extraction due to aging machinery, inadequate mining techniques, or insufficient investment in technology could lead to reduced production volumes, increased operational costs, and potential environmental damage.

##### *Processing and refining*

High energy consumption and inefficiencies in smelting and refining nickel into usable forms such as nickel matte could lead to several impacts like increasing costs, regulatory penalties for emissions, and delays in product delivery.

##### *Supply chain management*

Dependence on sea transport (tugboats and barges) for moving nickel ore, which is prone to delays due to weather, port congestion, or vessel maintenance issues. It could cause disruptions in the supply chain that lead to missed contractual obligations and financial losses.

#### **b. People Risks**

There were issues in the nickel mining site and

smelter plants where they employed insufficiently trained workers and rely on manual labor. That could lead to the risk of strikes or protests over wages and working conditions, work accidents, lower productivity, and operational shutdowns.

### c. System Risks

Since nickel export ban was implemented, new nickel smelter plants were built in Indonesia with various new technology depend on nickel product. Lack of regular machine maintenance and reliance on foreign technology could lead to operational disruption that will affect supply chain.

### d. External Event Risks

Nickel mining in Indonesia is highly scrutinized due to its environmental impact, including deforestation, water pollution, and greenhouse gas emissions. The risk of regulatory penalties, reputational damage, and disruptions due to community protests or legal actions could affect nickel production.

### Stress Test Analysis

The stress test scenario involved calculating the DSCR of INCO and ANTM under a significant drop in LME nickel prices, ranging from 30% to 50% of the 2022 average nickel price (USD26,023.72/ton). Financial data using company's 2022 nickel sales volume (assuming that there was no increased volume because the plants have operated in full capacity) and assumption of exchange rate of IDR/USD15,731.

The results revealed that if LME nickel price fell by 40%, reaching USD15,613.80/ton, ANTM recorded negative DSCR values. Furthermore, if the LME nickel price fell by 50%, reaching USD 13,011.50/ton, both companies recorded negative DSCR values. This indicates that neither company would be able to meet their interest and short-term debt obligations under such conditions.

TABLE V  
STRESS TEST

Price Down (%)	Nickel Price (USD/ton)	Revenue (IDR Billion)	EBITA (IDR Billion)	DSCR (times)
PT Vale Indonesia, Tbk (INCO)				
30%	18,216.10	17,468.54	3,260.05	46.43
40%	15,613.80	14,973.04	764.55	11.53
50%	13,011.50	12,477.53	(1,730.96)	-23.38
PT Aneka Tambang, Tbk (ANTM)				
30%	18,216.10	6,937.56	667.65	2.50
40%	15,613.80	5,946.48	(323.43)	-1.21
50%	13,011.50	4,955.40	(1,314.51)	-4.91

## 5. Conclusion and Recommendation

Key credit risks to consider when financing Indonesia's nickel industry and its derivatives from a bank's perspective include:

### a. Market Risk

China, the world's largest nickel buyer, plays a pivotal role in influencing nickel prices. Global demand is driven primarily by the stainless-steel industry, followed by the growing EV sector, making these industries critical factors for market stability.

### b. Commodity Risk

Nickel prices have shown high volatility, with annualized volatility reaching 50% during 2018–2023. A stress test revealed that if nickel prices dropped to USD 13,011.50/ton, companies would likely be unable to meet their debt obligations, posing a significant repayment risk.

### c. Financial Risk

Represented companies demonstrated strong financial performance from 2018 to 2022. In the latest year of 2022 Net Profit Margin of INCO reached 16.99% and ANTM 8.32%. Both companies consistently recorded increasing profit from 2018 to 2022.

In terms of liquidity, in the year of 2022 ANTM and INCO recorded healthy liquidity, reflected from Current Ratio (CR) above 1.0 times where INCO reached 5.66 times while ANTM recorded 1.96 times. Both were constantly reached CR above 1.0 times from 2018 to 2022.

Both companies also recorded good leverage in 2022 (DER below 220%); INCO reached 17% while ANTM was 42%. In the period of 2018 to 2022 INCO and ANTM never reached DER above 220%.

Regarding repayment capacity, in 2022 INCO and ANTM also showed strong debt repayment capacity (DSCR above 1.0 times); INCO achieved 93.48 and ANTM was 17.94. INCO was consistently reached DSCR above 1.0 times from 2018 to 2022, while ANTM from 2018 to 2020 recorded DSCR below 1.0 times and began to improve it in 2021 until 2022.

The Indonesian nickel industry presents a promising outlook, driven by abundant nickel reserves, favorable financial conditions, and strong future market potential. This growth also extends to derivative businesses, particularly shipping companies involved in nickel transportation, offering significant opportunities for expansion and development.

Some guidance in providing loan facilities to nickel industry derivatives:

### a. Perform Five-Pillar Credit Risk Analysis to

evaluate business performance and financial health comprehensively.

- b. Ensure the borrower has partnerships or binding contracts with financially strong, well-capitalized nickel companies to secure guaranteed payment streams.
- c. To mitigate risks associated with nickel price volatility and industry cycles, avoid extending the tenure of investment loans beyond a prudent period.

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