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EARLY DETECTION OF THE THREAT OF TRANSFER PRICING PRACTICES IN NICKEL EXPORTS FOR STATE REVENUE

Novaldi Sitindaon, Djoko Andoko, A. Victoria Rahajeng Widyarsih and Diah Ayu Permatasari.
State Intelligence College
Email: aldynovaldi@gmail.com

Abstract

The urgency of transfer pricing supervision in nickel exports lies in the potential for significant loss of tax revenue due to price manipulation practices between affiliated entities. If not addressed, this will weaken fiscal resilience and hinder the financing of national strategic programs. The purpose of the study is to analyze the Early Detection of the Threat of Transfer Pricing Practices in Nickel Exports for State Revenue. The method used is SWOT AHP. The results of the study show that based on the analysis using the Analytic Hierarchy Process (AHP) method, the SO1 strategy obtained the highest score (7.736) and was prioritized as the main strategy in early detection of the threat of transfer pricing in nickel exports. This strategy emphasizes optimizing PMK 172/2023 through the integration of Automatic Exchange of Information (AEOI) and big data processing, thus enabling a more accurate preparation of corporate risk profiles based on global transactions. The SO2 strategy, which integrates e-invoicing systems with AI and machine learning to detect price and volume anomalies, occupies second priority. Meanwhile, the SO3 strategy that focuses on the use of international cooperation is in third place. The highest criteria weight fell on Threat Detection (33.14%) and Incident Response (21.51%), indicating that the main focus in the country's intelligence strategy is prevention and rapid response to potential manipulative practices. The results of the consistency evaluation (CR ≈ 0.0264) showed that the assessment between the criteria was consistent and accountable. Thus, the AHP method has been proven to be effective as a systematic and data-driven decision-making tool in the context of fiscal surveillance and state intelligence strategies in the face of transnational threats.

Keywords– Early detection, transfer pricing, nickel export

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INTRODUCTION

Indonesia has recorded an extraordinary nickel export performance over the past decade, especially after the ban on raw ore exports. UN COMTRADE data shows that Indonesia's nickel export value will reach US$6.82 billion in 2023, dominated by nickel

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matte products and other downstream derivatives (Sari et al., 2021). This industrial transformation from upstream to downstream has not only changed the economic structure of the mining sector but also brought new consequences in terms of governance and tax compliance, especially related to transfer pricing (TP) risks.

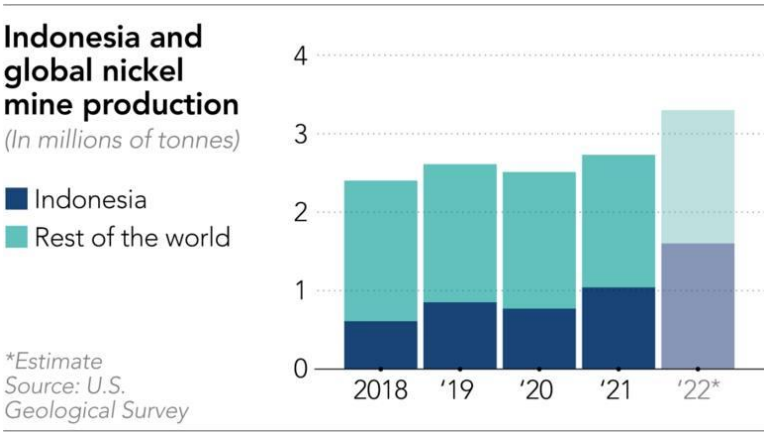


Figure 1 National Nickel Production
Source: US Geological Survey

Data from the US Geological Survey displayed on the global nickel mine production chart shows that Indonesia's nickel production continues to experience significant increases from year to year, especially after 2020. In 2022, Indonesia's estimated nickel production will exceed 1.6 million tons, making it the largest contributor compared to other countries in the world. This spike is in line with the policy of banning the export of raw nickel ore and the acceleration of national downstreaming, which encourages the construction of smelters and cooperation with multinational entities. However, this surge in volume contains potential invisible risks, namely transfer pricing (TP) practices in export transactions between affiliated parties which can reduce the potential for state revenue from the tax sector (Adegboyega et al., 2024).

The increase in nominal export value opens up space for abuse of internal pricing mechanisms between entities in a business group. In the context of industrial globalization, transfer pricing practices are not always illegal, but when used aggressively, TP becomes a means to shift profits to low-tax jurisdictions, which ultimately erodes the potential tax revenues of the country of origin. According to the basic concept, transfer pricing is the determination of prices in transactions of goods, services, or intangible assets between two entities that have a special relationship. If not controlled, this practice allows multinational corporations to circumvent tax obligations through price engineering that appears reasonable but is far from market prices. In the Indonesian context, this is a serious concern, especially in the mining sector which involves many international parties in its supply chain (Eukeria, 2024).

Firdausyah et al. (2024), in their empirical study in *the West Science Journal* , found that TP has a significant influence on tax avoidance in energy mining companies. Tax avoidance practices occur through various channels, including the imposition of

management fees, royalties, and technical services from overseas headquarters or affiliates.

Furthermore, Soegiarto and Nisa (2025) in their research emphasized that the incentive to *tunnel* or transfer resources from subsidiaries to parent entities is the main driver of TP aggressiveness in Indonesian mining companies in the 2019–2023 period. This shows that TP is not only a technical accounting problem, but also a corporate strategy issue that can harm national fiscal.

In terms of regulation, Indonesia has actually taken progressive steps. The Ministry of Finance has issued PMK No. 172/2023 as a refinement of the TP policy, emphasizing the obligation of local and parent documentation, and regulating advance pricing agreements (APA) as a dispute prevention measure. This regulation adopts the arm's length principle in accordance with OECD guidelines, namely fair prices as transactions are carried out by independent parties (Wealth, E., Smulders, SA, & Sebele, F. 2023).

However, the comprehensive regulation does not guarantee effective implementation. Challenges arise in the form of limited human resources in the Directorate General of Taxes (DGT), technical understanding of the mining industry, and minimal integration of cross-border transaction data. According to the IBFD analysis (2021), there is still inconsistency in the implementation of APA and ambiguity in the interpretation of fair prices in strategic mineral transactions such as nickel (Scurfield, 2016).

In practice, TP audits often encounter obstacles in assessing the fairness of transfer prices, especially when companies refuse to provide comparable data or when the global market lacks independent price references, as is the case with nickel matte. In this situation, Das Sein points out the reality that mining companies can exploit data and regulatory gaps to set transfer prices that benefit them (IMF. 2020) .

On the contrary, Das Sollen demands that all transactions between entities within the group must reflect objective market prices, as per the spirit of the OECD Guidelines. This is where the gap between reality and expectations lies, especially when tax authorities do not yet fully have early detection tools for price manipulation in the nickel supply chain.

The increase in the number of smelters from only 2 units in 2014 to more than 30 units in 2025 reflects the progress of nickel downstreaming, but at the same time expands the potential for transfer pricing risks. Transactions between entities within one group, both for nickel matte processing, logistics, and finished product exports, are becoming increasingly complex and difficult to monitor in real time (Christensen, J. (2009). This complexity creates opportunities to hide profits in the form of commission markups between affiliated companies, royalties to overseas subsidiaries, or underinvoicing of exports. This is exacerbated by the limitations of fiscal authorities in obtaining cross-border information quickly and comprehensively.

On the other hand, there is still a lack of research related to the formation of a benchmarking database specifically for nickel matte products and their derivatives. This

makes it difficult for authorities to apply the Comparable Uncontrolled Price (CUP) method accurately in the TP audit process. Not only that, the big data and artificial intelligence (AI) systems owned by the DGT are not yet optimal in conducting predictive analysis of suspicious transactions. The lack of data integration between technical ministries (ESDM, BKPM) and the DGT hinders the efficiency of early detection and prevention of price deviation practices. In fact, Law No. 36 of 2008 concerning Income Tax has expressly regulated that all affiliated transactions must use the arm's length principle, and deviations from this principle can be subject to fiscal correction. Unfortunately, more specific sectoral regulations for mining have not been developed much until now (Cooper et al., 2017).

This condition poses a serious threat to national fiscal resilience. The potential loss of tax revenue from TP practices on nickel exports could reach billions of rupiah, which would certainly erode the country's ability to fund strategic programs. If state revenues decline due to aggressive TP practices, key sectors such as national defense and security, infrastructure development, and public welfare will also be affected. National resilience in a broad sense will be weakened when fiscal independence is disrupted (Kabala, E., & Ndulo, M. 2018) .

Therefore, the urgency of strengthening early detection of TP in the nickel export sector cannot be postponed. Synergy is needed between the Directorate General of Taxes, the Ministry of Energy and Mineral Resources, the BPKP, and even the Corruption Eradication Commission (KPK) in forming an integrated risk-based supervision system. Efforts that can be taken include increasing the technical capacity of tax auditors, forming cross-sectoral TP teams for strategic commodities, digitizing affiliated transaction reporting, and international data exchange cooperation through the Automatic Exchange of Information (AEOI). With these steps, Indonesia will not only strengthen tax revenues, but also build a strong foundation for sustainable development and economic sovereignty in the era of globalization. Transfer pricing is not just a taxation issue, but also part of the struggle to maintain fiscal sovereignty and national economic justice.

RESEARCH METHODS

In this study, the method used is a descriptive qualitative method, which aims to systematically and factually describe how early detection strategies can be formulated in dealing with the threat of transfer pricing practices on Indonesian nickel exports. Data collection techniques are carried out through library research and literature review. As explained by Soerjono Soekanto (1998), this method is very relevant for digging up secondary data from official documents, tax laws and regulations, academic journals, tax audit reports, and mining sector policies. In addition, Bambang Waluyo (1996) emphasized that this approach allows researchers to study normative and empirical aspects, especially in the context of international tax regulations and national nickel industry governance.

To analyze the data, two main analysis tools were used, namely SWOT Analysis and Analytical Hierarchy Process (AHP). SWOT Analysis was used to identify the

strengths, weaknesses, opportunities, and threats faced by the government in conducting early detection of transfer pricing practices in the nickel export sector. Meanwhile, AHP Analysis was applied to prioritize supervisory strategies and fiscal policies, based on certain criteria such as audit effectiveness, availability of comparative data, human resource capacity, legal certainty, and international cooperation. The combination of these two approaches allows the formulation of a holistic and structured early detection strategy, covering internal dimensions (DGT capacity, data infrastructure, TP regulations) and external dimensions (complexity of the global supply chain, nickel price dynamics, and multinational corporate compliance).

RESULTS AND DISCUSSION

A. Perspective Of The Threat Of Transfer Pricing Practices In Nickel Exports For State Revenue

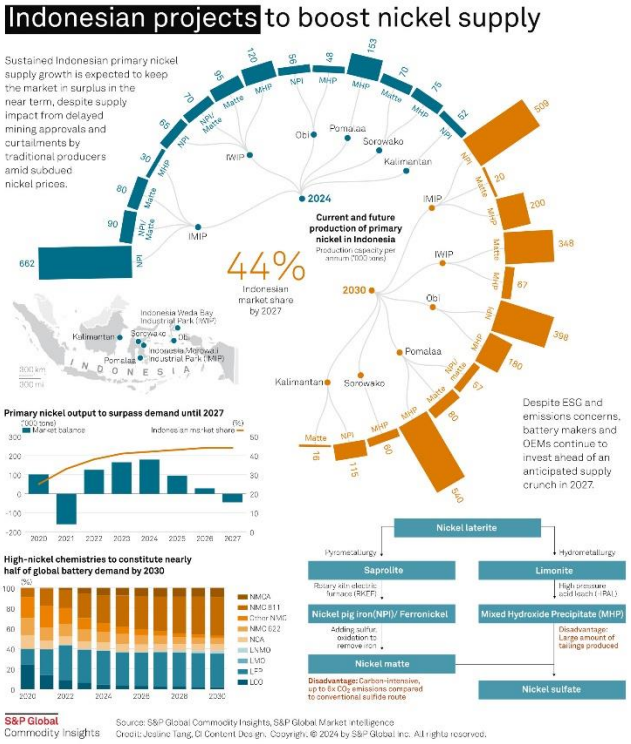


Figure 1 Indonesia Project to Boost Nickel Supply

Source : S&P Global Commodity Insights

This figure from S&P Global Commodity Insights shows that Indonesia is expected to control 44% of the world's primary nickel production market share by 2027, making it a central actor in the global nickel supply chain. The increase in mining projects in regions such as Kalimantan, Sulawesi, and Maluku shows that nickel production expansion is very aggressive. However, this production dominance does not necessarily guarantee the optimization of state revenues if transfer pricing (TP) practices are not detected and monitored strictly. The potential for TP arises because most of these projects

are run by multinational companies or joint ventures involving cross-country affiliated entities (Müller, CEG et al. 2017) .

In the context of exports, TP practices can occur when entities in Indonesia sell nickel to foreign affiliates at prices below market value (underinvoicing), or charge disproportionate royalties, technical services, or management fees. With a complex and dispersed project structure, as seen in the figure, and the involvement of many foreign parties, the space for price manipulation and shifting profits to low-tax jurisdictions is increasing. This is certainly a real threat to Indonesia's tax revenues and export foreign exchange (Sikka et al., 2013) .

The threat of TP is also exacerbated by the nickel investment pattern that not only produces nickel matte, but also downstream products such as Mixed Hydroxide Precipitate (MHP) and nickel sulfate used in the battery industry. These products are often exported to affiliates in the global EV industry ecosystem, making price fairness audits very complicated without transparent market benchmarking. If not monitored comprehensively, export values will be recorded as low, even though the real added value is absorbed by foreign entities. (Silberstein, 2009).

Furthermore, the graph “Primary nickel output to surpass demand until 2027” shows that Indonesia will continue to export nickel even though global supply exceeds demand. This imbalance could be a pretext for exporters to lower selling prices internally which in the context of TP, can be used to avoid taxes under the pretext of market pressure. In fact, many companies actually continue to sell to overseas affiliates with hidden margins that are difficult for fiscal authorities to track.

Therefore, although the graph shows Indonesia's progress in controlling the global nickel market, from a fiscal perspective, this situation demands an early detection system and sector-specific transfer pricing regulations. The government must immediately strengthen TP risk analysis on all nickel and derivative exports, including with a big data-based approach, integration of cross-agency reporting systems, and international cooperation to obtain accurate and legitimate cross-border transaction comparison information.

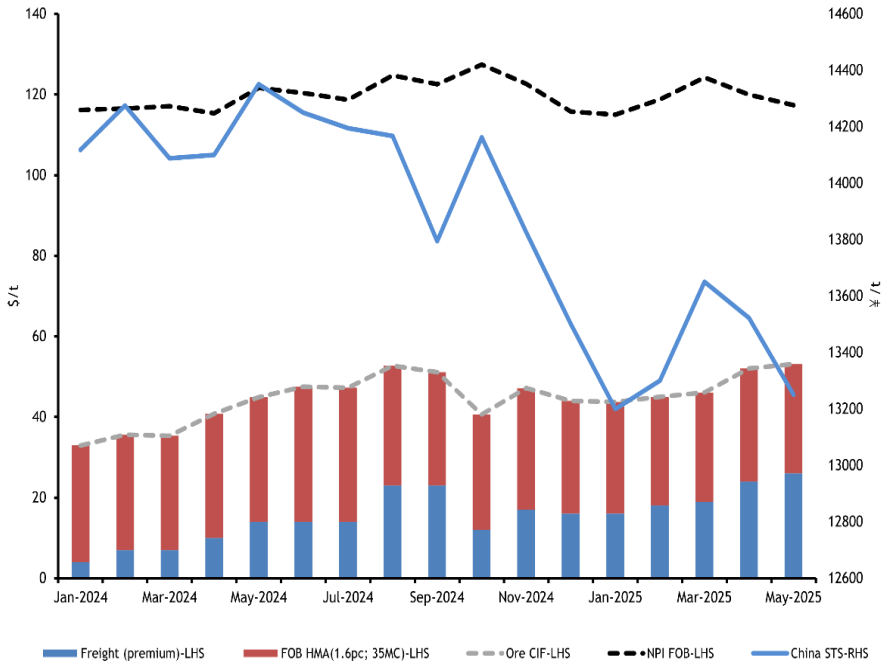


Chart 1 Nickel Price Dynamics
Source: Sundaram, JK 2012

The graph above presents the dynamics of nickel prices and export cost components during the period from January 2024 to May 2025. The left axis (LHS) shows prices in $/ton for various components such as *freight* , FOB HMA (Feeding Ore) prices, and CIF Ore. While the right axis (RHS) displays China's STS prices in Yuan/ton (blue line). This visualization provides an overview of global price fluctuations and the potential risk of price manipulation in the nickel export supply chain, especially in inter-affiliate transactions that are fertile ground for transfer pricing (TP) practices (Sundaram, JK 2012) .

One important element of this graph is the variation in *freight premium* and FOB HMA prices. It can be seen that in the period May–September 2024, there was a sharp spike in shipping costs and FOB values, which was then followed by a significant decline in January 2025. This variation has the potential to be abused by exporters in business groups by inflating freight costs or lowering official export values, so that taxable profits in Indonesia are smaller. This is where TP practices can be hidden in the logistics and transportation cost components (Torres Preciado, EG 2019).

The gray dashed line (Ore CIF) shows the nickel price received in the import destination country, which appears relatively stable compared to fluctuations in shipping costs and FOB. The discrepancy between the export price from Indonesia and the price received abroad indicates the possibility of underinvoicing, where the export value is reported lower than the real price paid by the affiliate abroad. This is a major loophole in the national export tax control system (Skúlason, S., & Hayter, D. 1998) .

The dashed black line (NPI FOB) is relatively stable, reflecting the export value of nickel pig iron. However, the significant difference between the NPI price and the FOB HMA and CIF values can also be used by affiliated entities to conduct internal price arbitrage. This is a concern because the company can claim that the selling price to affiliates is low due to a sluggish market, while the actual profit is still being drawn by foreign entities in the same group.

China STS prices (solid blue line) show an overall downward trend from January 2024 to May 2025. However, sharp fluctuations especially between September 2024 and January 2025 indicate market pressure that can be used as an excuse to disguise affiliated transactions. In TP practices, multinational corporations often use this market trend to justify low prices, even though the transactions are not conducted with independent parties, but entities within the same business group (Tørsløv, TR, Wier, LS, & Zucman, G. 2020).

It is important to note that in this graph, *freight* and FOB values contribute significantly to the total reported export value (Gorede ma, C. 2017) . If companies increase the freight cost component internally (for example by chartering ships from affiliated companies at high rates), then they can reduce the reported profit margin in Indonesia. This is a form of disguised profit shifting that has a direct impact on state revenues from export taxes and corporate income tax (Donnelly, L. 2015) .

Considering the price fluctuations, complexity of cost structures, and potential manipulation of inter-affiliate transaction prices as depicted in this graph, it is important for the country to implement early detection based on international price data, sector-specific TP audits, and the preparation of TP regulations based on strategic commodities such as nickel. Without these efforts, the surge in nickel production and exports could actually become a fiscal irony of large volume, small revenue (Curtis, A., & Todorova, O. 2011).

A. AHP SWOT Analysis

In facing the strategic threat of transfer pricing (TP) practices in nickel exports, the application of a combination of SWOT (Strengths, Weaknesses, Opportunities, Threats) and Analytic Hierarchy Process (AHP) methods is an effective and relevant analysis approach. The country's fiscal supervision strategy, especially through the Directorate General of Taxes (DGT) and related agencies, needs to be structured and data-based to detect early price manipulation practices of transactions between affiliated entities. SWOT analysis provides the ability to map internal and external factors that influence the effectiveness of TP supervision in the increasingly complex and global nickel export sector.

In this context, strengths can include the existence of domestic regulations such as PMK 172/2023 on transfer pricing, as well as digital infrastructure that has begun to be developed by the Directorate General of Taxes to monitor cross-border transactions. However, weaknesses are also significant, such as limited nickel matte price benchmarking, lack of trained human resources in nickel-producing areas, and regulatory

gaps that do not specifically regulate the mining sector. On the opportunities side, there is potential to expand cross-border tax information exchange (AEOI) cooperation, as well as the use of big data and integration of national export-import systems. Meanwhile, the main threats include the dominance of multinational companies in the nickel industry, the secrecy of affiliate schemes, and global price dynamics that can be misused to justify unfair transfer prices.

The AHP method serves to complement SWOT by providing strategic weighting and priority to each of these factors. Through AHP, policy makers can evaluate which elements are most critical: whether strengthening TP audits, increasing human resource capacity, establishing a reference price center, or intensifying international cooperation. This hierarchical weighting reduces subjectivity in decision-making and strengthens arguments in formulating fiscal policies and preventing the loss of state revenue due to TP practices.

The country's fiscal and economic intelligence strategy in this context also needs to emphasize the importance of data integration between agencies: starting from the Directorate General of Taxes, Customs, Ministry of Energy and Mineral Resources, to the BPKP. With the support of AHP, it can be determined which agency has the most strategic role to be improved in order to detect nickel transaction anomalies between affiliates. Just as drug abuse requires an integrated intelligence system, TP practices also require a cross-sector approach that is based on data, simultaneous supervision, and a deep understanding of the industry structure.

Furthermore, the combination of SWOT-AHP can be used to build an early warning system for TP practices in the strategic commodity sector. This system will be able to identify deviant transaction patterns in real time, especially when associated with global price trends, export volume patterns, and certain business group affiliations. The advantage of this approach is its high measurability, so that the resulting strategy is more accountable and can be used as a basis for revising regulations or targeted fiscal interventions.

This combined approach also supports the development of risk-based policy scenarios. For example, if the analysis shows an increase in underinvoicing to certain countries such as China or South Korea, then countries can prepare responses such as renegotiating export benchmark pricing schemes, or strengthening the Mutual Agreement Procedure (MAP) framework. In addition, the analysis can be used by policymakers to advocate for new regulations that are more specific to strategic mining sectors.

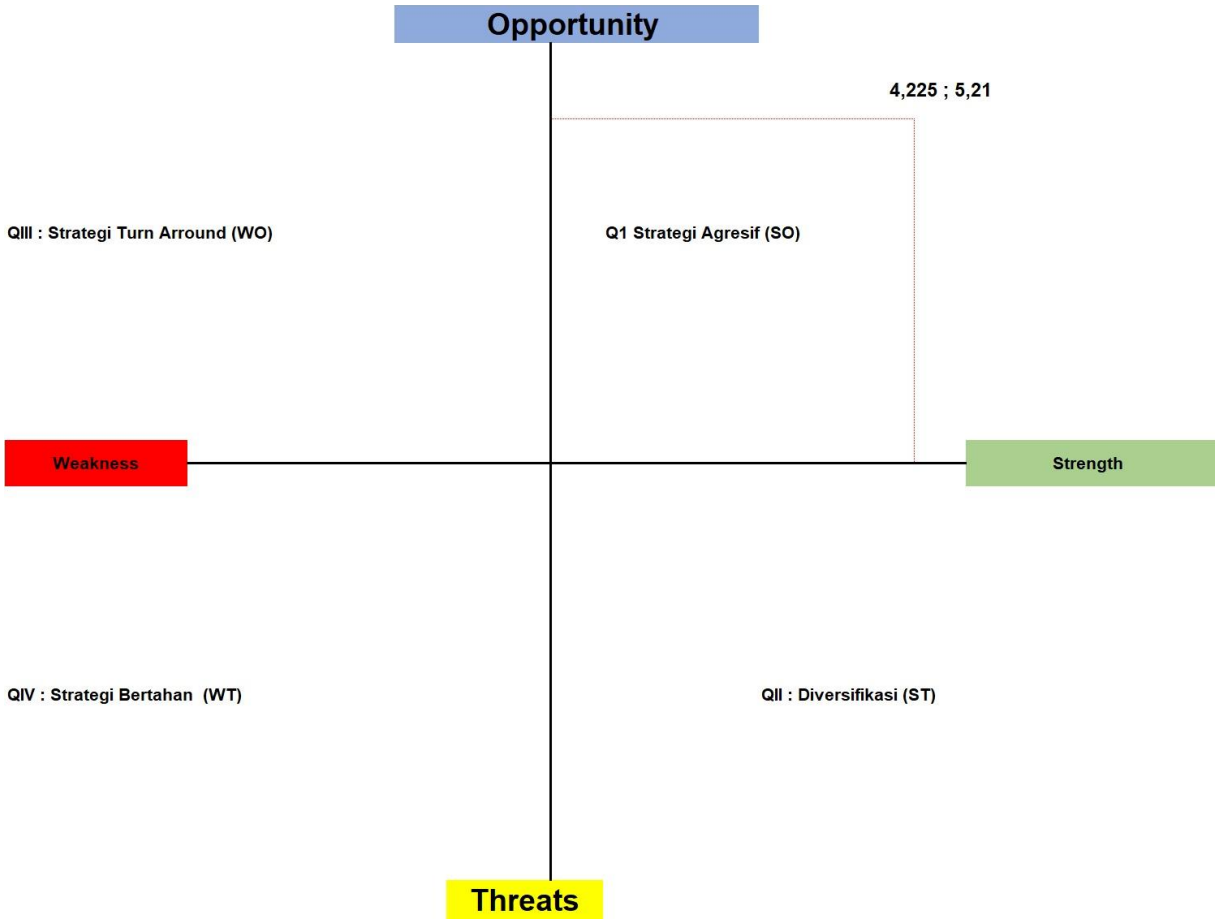
Thus, the integration of SWOT and AHP methods becomes a strategic analysis tool in responding to the threat of transfer pricing practices that can erode state revenues from the high-value nickel export sector. This approach ensures that the monitoring strategy is not only reactive, but also proactive, evidence-based, and measurable. In the context of national fiscal and economic resilience, this method strengthens the state's position in maintaining tax justice, closing revenue leakage gaps, and ensuring that Indonesia's natural resources provide maximum benefits for financing national development and defense.

Table 1 Swot Early Detection Of The Threat Of Transfer Pricing Practices In Nickel Exports For State Income

STRENGTH	OPPORTUNITIES
• The existence of national transfer pricing regulations such as PMK 172/2023 which strengthens the legal framework. • Availability of digital tax infrastructure based on big data and e-invoices • Bilateral tax cooperation network through Automatic Exchange of Information (AEOI).	• Potential for international cooperation for the exchange of transfer pricing information in the mining sector. • Implementation of AI-based surveillance technology and transaction behavior analysis. • Fiscal oversight momentum amid rising global nickel prices and demand.
WEAKNESS	**THREATS**
• There is no specific market price comparison (benchmarking) for nickel products such as matte and MHP. • Weak coordination between agencies such as the Directorate General of Taxes, Customs and Excise, and the Ministry of Energy and Mineral Resources in TP audits. • Limited regional tax human resources in understanding multinational transfer pricing schemes.	• Cross-ownership structures and global affiliation complexities make it difficult to track transactions. • Underinvoicing and misinvoicing practices in nickel matte exports to certain destination countries. • The price gap between official export values and international market prices.

Source: Data Processed by Researchers, 2024

Based on this analysis, the strategy obtained is SO or Strength Opportunity with the following quadrants and matrices:



SWOT Quadrant 1 Chart

Source: Data Processed by Researchers (2024)

The following are three Strength–Opportunity (S–O) strategies that can be applied in the context of early detection of threats of transfer pricing practices in nickel exports:

1. Optimizing the utilization of PMK 172/2023 through AEOI collaboration and big data processing enables the DGT to compile risk profiles of mining companies based on global transactions and identify TP patterns more accurately.
2. Integration of the e-invoice system with AI and machine learning technology can accelerate the detection of price anomalies and export volumes between affiliates, especially during spikes in nickel demand in the global market.
3. Utilizing international cooperation to synchronize contract data and price comparisons between countries by utilizing digital infrastructure that Indonesia already has will strengthen the national fiscal position in following up on TP practices in a systematic and measurable manner.

In the context of the country's intelligence strategy in dealing with transnational threats from the misuse of kratom plants in Indonesia, the application of *the Analytic Hierarchy Process* (AHP) method is an effective analytical tool to support strategic decision-making systematically and based on data. Researchers use the AHP approach to

evaluate intelligence strategies objectively by considering a number of key criteria that influence efforts to detect and prevent illegal cross-border kratom trade. The criteria used include threat detection, incident response, prediction of potential new threats, kratom circulation risk management, intelligence reliability and accuracy, operational cost efficiency, and ethical considerations in implementing intelligence activities (Saaty, 2008).

The initial step in AHP analysis is to define the main objective, which is to design the most effective intelligence strategy in dealing with the transnational threat of kratom. Next, the researcher creates a hierarchical structure consisting of objectives, criteria, and alternative strategies that may be implemented. After the structure is formed, *a pairwise comparison matrix is compiled* to assess the relative importance between criteria in pairs.

After that, matrix normalization is carried out to obtain the weight value of each criterion quantitatively. The weight is then used to assess each alternative strategy against each previously determined criterion. This stage aims to determine the extent to which a particular strategy is able to meet important dimensions in the intelligence system, especially in the context of monitoring and overcoming kratom abuse.

The final score is calculated by adding the results of multiplying the criteria weights by the assessment scores of each strategy. The final stage is to measure the consistency of the assessment using the consistency ratio (Consistency Ratio/CR) to ensure that the assessment between criteria is not subjective or significantly inconsistent. If the CR value is below 0.1, then the assessment is considered valid and consistent (Saaty, 2008).

With this AHP approach, policy makers can evaluate and choose the most effective and efficient intelligence strategy in combating illegal kratom trade. This analysis also provides a rational and transparent basis for allocating resources, increasing cooperation between agencies, and implementing more accurate and risk-based intelligence operations. In the context of transnational threats, this approach is important to ensure that the country's intelligence strategy is not only reactive, but also proactive and adaptive to global dynamics. To determine strategic priorities using the Analytic Hierarchy Process (AHP), here are the complete steps of the analysis:

1. **Assessment criteria**

- C1: Threat Detection
- C2: Incident Response
- C3: Threat Prediction
- C4: Risk Management
- C5: Accuracy Reliability
- C6: Cost Efficiency
- C7: Ethical Considerations

2. **Pairwise Comparison Matrix between Criteria**

Table 1 Pairwise Comparison Matrix between Criteria

	C1	C2	C3	C4	C5	C6	C7
C1	1	2	3	4	3	5	4
C2	0.5	1	2	3	2	4	3
C3	0.33	0.5	1	2	1	3	2
C4	0.25	0.33	0.5	1	1	2	2
C5	0.33	0.5	1	1	1	3	2
C6	0.2	0.25	0.33	0.5	0.33	1	1
C7	0.25	0.33	0.5	0.5	0.5	1	1

3. Normalization Matrix and Criteria Weight Calculation

Table 2 Normalization Matrix and Criteria Weight Calculation

	C1	C2	C3	C4	C5	C6	C7
C1	0.3497	0.4073	0.3601	0.3333	0.3398	0.2632	0.2667
C2	0.1748	0.2037	0.2401	0.2500	0.2265	0.2105	0.2000
C3	0.1154	0.1018	0.1200	0.1667	0.1133	0.1579	0.1333
C4	0.0874	0.0672	0.0600	0.0833	0.1133	0.1053	0.1333
C5	0.1154	0.1018	0.1200	0.0833	0.1133	0.1579	0.1333
C6	0.0699	0.0509	0.0396	0.0417	0.0374	0.0526	0.0667
C7	0.0874	0.0672	0.0600	0.0417	0.0566	0.0526	0.0667

4. Criteria Weight (Eigenvector)

Table 3 Criteria Weights (Eigenvector)

Criteria	Weight
C1	0.3314
C2	0.2151
C3	0.1298
C4	0.0928
C5	0.1179
C6	0.0513
C7	0.0617

5. Alternative Score Matrix against Criteria

Table 4 Alternative Score Matrix against Criteria

Strategy	C1	C2	C3	C4	C5	C6	C7
SO1	9	7	8	7	8	6	5
SO2	7	8	6	8	7	7	6
SO3	6	6	7	6	6	8	7

6. Weighted Scores Multiplication

Table 5 Multiplication of Weights and Scores (Weighted Scores)

Strategy	Total Weighted Score
SO1	7,736
SO2	7.116
SO3	6.294

7. Strategic Priorities

Table 6 Strategy Priorities

Strategy	Score	Priority
SO1	7,736	1 (Main)
SO2	7.116	2
SO3	6.294	3

8. **Manual Consistency Ratio (CR) Calculation**

Weight (eigenvector) of each criterion:

Table 7 Weights (eigenvectors)

Criteria	Weight (w_i)
C1	0.331434
C2	0.215088
C3	0.129773
C4	0.092832
C5	0.117868
C6	0.051257
C7	0.061748

Use this multiplication result (previously calculated):

Table 8 Weights (eigenvectors)

Criteria	$A \times w_i$
C1	2,509

Criteria	$A \times w_i$
C2	1,528
C3	0.847
C4	0.598
C5	0.901
C6	0.311
C7	0.381

Table 9 Calculate $\lambda_i = (A \times w_i) / w_i$

Criteria	$\lambda_i = (A \times w_i) / w_i$
C1	2.509 / 0.331434 = 7.572
C2	1.528 / 0.215088 = 7.102
C3	0.847 / 0.129773 = 6.527
C4	0.598 / 0.092832 = 6.443
C5	0.901 / 0.117868 = 7.643
C6	0.311 / 0.051257 = 6.068
C7	0.381 / 0.061748 = 6.170

Calculate λmax (average of all λ_i)

$\lambda max=7.572+7.102+6.527+6.443+7.643+6.068+6.1707\approx 6.7907\lambda_{\text{max}} = \frac{7.572 + 7.102 + 6.527 + 6.443 + 7.643 + 6.068 + 6.170}{7}\approx 6.7907$

Calculate CI (Consistency Index)

$CI=\lambda max-nn-1=6.7907-76=-0.20936=-0.0349CI = \frac{\lambda_{\text{max}} - n}{n - 1} = \frac{6.7907 - 7}{6} = \frac{-0.2093}{6} = -0.0349$

Calculate CR (Consistency Ratio)

With **RI for n = 7** is **1.32** :

$CR=CIRI=-0.03491.32\approx -0.0264CR = \frac{CI}{RI} = \frac{-0.0349}{1.32} \approx -0.0264$

CR ≈ 0.0264 → < 0.1

Interpretation: The pairwise comparison matrix **is consistent** and **valid** for use in AHP. This is illustrated as follows:

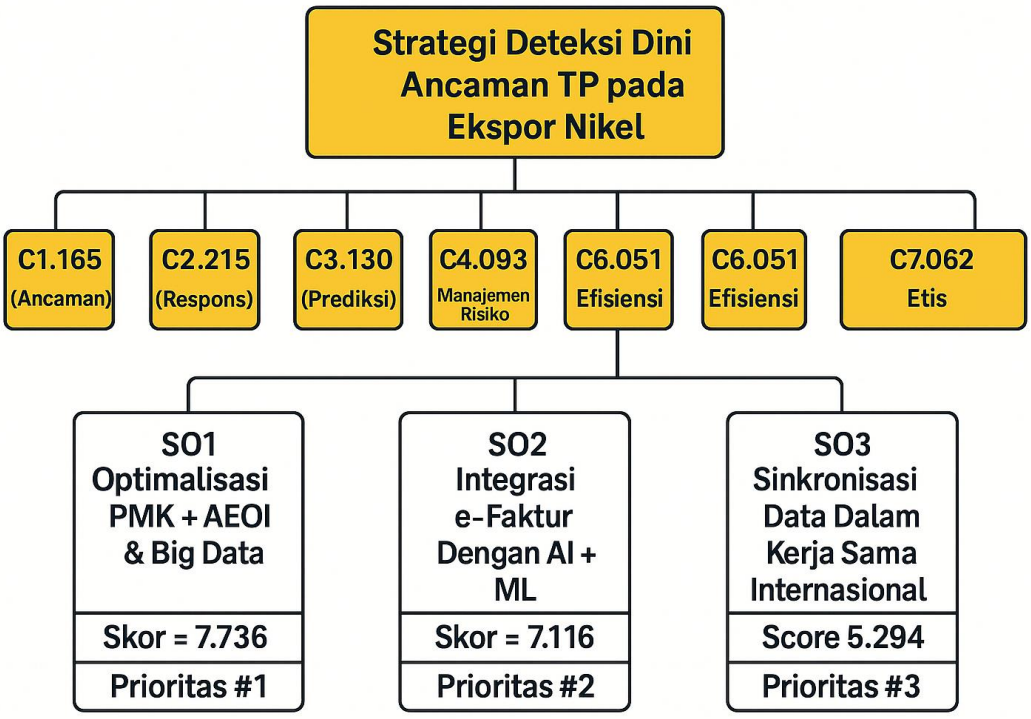


Chart 1 AHP analysis

Source: Data Processed by Researchers (202 **5**)

CONCLUSION

Based on the results of the analysis using the Analytic Hierarchy Process (AHP) method, the SO1 strategy is considered the most effective and prioritized strategy in early detection efforts against the threat of transfer pricing (TP) practices in nickel exports. This strategy received the highest score of 7,736, which indicates its level of effectiveness in meeting various strategic criteria that have been set. The main focus of this strategy is optimizing the implementation of the Minister of Finance Regulation (PMK) No. 172 of 2023 through the integration of Automatic Exchange of Information (AEOI) and the use of big data technology. This step provides the Directorate General of Taxes (DGT) with the ability to compile a risk profile of mining companies based on global transactions and identify transfer pricing patterns more accurately, adaptively, and proactively.

SO2 strategy ranks second with a score of 7,116. This strategy proposes the integration of the e-invoice system with Artificial Intelligence (AI) and machine learning technology to accelerate the detection of price and export volume anomalies, especially in the context of inter-affiliate transactions. The use of AI is able to identify outliers and unusual patterns in real-time, thus supporting fiscal oversight measures that are more responsive to global market fluctuations, especially in the nickel sector which is heavily influenced by international demand.

Meanwhile, the SO3 strategy, which scored 6,294, was in third place. This strategy relies on the use of international cooperation, with the aim of synchronizing

contract data and price comparisons between countries through digital infrastructure that is already available in Indonesia. This strategy emphasizes the importance of openness of information and global transparency in supporting supervision of TP practices, especially through data exchange across fiscal jurisdictions. Although strategic in the long term, the complexity of implementation and dependence on the political will of partner countries are major challenges.

In the AHP analysis, the highest criteria weight is given to Threat Detection (C1) at 33.14%, followed by Incident Response (C2) at 21.51%, and Threat Prediction (C3) at 12.98%. This shows that in the context of fiscal intelligence strategy, the prevention aspect and rapid response to symptoms of manipulative practices are more prioritized than cost efficiency or ethical considerations.

The consistency of the assessment between criteria has also been tested through the calculation of the Consistency Ratio (CR) which produces a value of 0.0264, far below the threshold of 0.1. This indicates that the assessment used in the pairwise comparison matrix has been carried out rationally and consistently, so that the final results are considered valid and can be used as a basis for strategic decision making.

Overall, the application of the AHP method in this context has proven to be very effective in supporting complex and data-driven decision-making processes. Not only does it provide objective strategic priorities, AHP also helps direct the country's fiscal and intelligence oversight policies in dealing with transnational threats systematically, efficiently, and adaptively to global dynamics.

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