

## Into Sustainable and Equitable Nickel Downstreaming in Indonesia: What Policy Reforms are Needed?

Bahlil Lahadalia<sup>1</sup>, Chandra Wijaya<sup>2</sup>, Teguh Dartanto<sup>3</sup>, Athor Subroto<sup>4</sup>

### Abstract

*Nickel downstreaming offers a significant improvement in Indonesia's economy, yet regions housing industrial sites face challenges in unemployment, tax revenue, community involvement, and environmental degradation. To achieve sustainable and equitable goals, the downstreaming policy needs to be reformed. This study identifies the needed reforms for nickel downstreaming in Indonesia using regulatory impact assessment, supplemented by expert judgments. In the short term, the government needs to revise the revenue sharing scheme for local governments and establish a downstream fund management institution. In the long term, the government can provide additional capital injection to the fund management institution, downstream to be able to provide support for more productive local investment and implement technology transfer requirements for foreign investors to get incentives.*

**Keywords:** *downstreaming, policy reform, regulatory impact assessment.*

### Introduction

Downstreaming is one of the main strategies of the Indonesian government to encourage reindustrialisation and structural transformation such as Japan and South Korea (Tang, 1998; Rodrik, 2013; Choi & Levchenko, 2021). Through downstreaming in Indonesia, especially nickel downstreaming, the government attempts to increase added value, investment, GDP, exports and job creation.

The significance of the policy heightened after the enactment of the Mineral and Coal Law in 2009 (Desdiani et al., 2023). This law prioritised the transformation of mineral resources into value-added activities, initially imposing a ban on raw mineral exports. However, this restriction was later relaxed until the introduction of a significant revision, Law No. 3 of 2020 on Mineral and Coal. This revision shifted the focus to the downstreaming policy, emphasising the promotion of added value in mining products before exportation. The approach involves prohibiting raw material exports and encouraging downstream mining industries.

The downstreaming policy has significantly impacted the Indonesian economy. At the national level, it has led to a noteworthy increase in export value. Export of nickel derivative products surged from US\$3.3 billion in 2017 to US\$33.8 billion in 2022, a substantial growth that provides the central government with increased access to foreign currency. Furthermore, nickel downstreaming has attracted foreign investors. In nickel rich regions such as Morowali and Central Halmahera, FDI reached nearly US\$8 billion

---

<sup>1</sup> School of Strategic and Global Studies, University of Indonesia, Indonesia

<sup>2</sup> Faculty of Administrative Science, University of Indonesia, Indonesia

<sup>3</sup> Faculty of Economics and Business, University of Indonesia, Indonesia

<sup>4</sup> School of Strategic and Global Studies, University of Indonesia, Indonesia

and US\$3.2 billion, respectively in 2022 – a huge rise since export ban in early 2020. Importantly, this transformative policy has reshaped the GDP structure of those regions, now relying less on consumption, thus fostering a more productive economic structure and driving overall economic growth.

However, current nickel downstreaming lacks full equity and sustainability. Partnerships between investors and local MSMEs are under-optimised, with a tendency for investors to collaborate with external businesses in regions like Morowali. The absorption of local labour and empowerment of the local community remains suboptimal. Additionally, the low educational levels in nickel downstreaming areas, primarily at the primary school level, hinder the development of the local workforce. Job creation impact is suboptimal especially in Morowali, where migrants, not locals, predominantly fill the created positions. Environmental concerns arise from increased air and water pollution due to inadequate waste treatment, paralleling findings on industrialization in China by Liu & Bae (2018).

Hence, aligning with the Sustainable Development Goals (SDGs), it is imperative that nickel downstream policies prioritise justice and sustainability. Beyond the SDGs, sustainable development underscores the significance of Environmental, Social, and Governance (ESG) norms, a focal point for companies supporting sustainable development efforts (Chen, 2023). Notably, countries adhering to stringent ESG reporting criteria tend to perform better in the SDGs Index, emphasising the pivotal role of effective ESG reporting policies in driving sustainable economic growth (Plastun et al., 2020).

Given the less-than-ideal impact of current downstreaming, this study aims to identify the reforms for downstreaming policies. The primary objective is to provide policy recommendations for enhancing the equity and sustainability of downstreaming, in both the short and long term. We use regulatory impact assessment as a framework and ask a panel of industrialisation experts with multi-criteria analysis to find out the required reforms. The next section will dive into detail about our method, followed by the result and discussion.

## **Literature Review**

A policy will indeed benefit one group and potentially harm others, especially in the context of industrial and trade policies (Gasiorek et al, 2019; Lamp, 2018). This requires the government to continue to make improvements in accordance with the principles of good governance through systematic policy evaluation (Kirkpatrick & Parker, 2004). Furthermore, according to Kirkpatrick & Parker (2004), such systematic evaluation can be achieved by using regulatory impact assessment (RIA). OECD (2008, 2012, 2020) defines RIA as a comprehensive structured evaluation process of the potential economic, social, and environmental impacts of new or amended regulations.

Described as the process of identifying and evaluating the intended impact of a regulation, RIA uses consistent analytical techniques such as cost-benefit analysis (Baldwin et al, 2011). RIA users compare predetermined regulatory objectives and identify policies that can affect the achievement of goals. All available options must be evaluated in the same way, so as to provide information to decision makers and allow them to systematically choose the most effective and efficient option (Suska, 2012). Verico (2018) has tried to assess trade policy, investment, and industrial incentive policy using RIA method.

In order to promote economic transformation, many developed country governments use active state policy interventions for the development of the manufacturing sector as a sector that has a high multiplier effect in the long run. This policy intervention is known as "industrial policy" which refers to active government intervention to encourage

industrialization. This policy was carried out by the United States and Germany in the 19th century and Asian tiger countries such as Japan, South Korea, Taiwan and China in the 20th century (Lin JY & Chang 2009). Downstreaming currently carried out by the Indonesian government is included in this industrial policy because it is characterized by active government policies such as through the ban on nickel ore exports with the aim of promoting economic transformation.

In recent years, along with the increasing use of industrial policies by developed countries, the literature of empirical studies on the impact of these policies has been increasingly published, including those that provide conclusions that under certain conditions these policies are proven to be able to encourage economic progress. Juhasz et al (2022) found that the number of countries' policies classified as "industrial policies" increased rapidly from 228 in 2017 to 1,568 in 2022. Juhasz et al. (2023) mentioned that it is no longer possible to claim that industrial policies are ineffective or counterproductive. These policies have the potential to drive long-term transformational effects. In addition, Lane (2021) showed that the industrial sectors targeted by Heavy and Chemical Industrialization (HCI) in South Korea experienced short-term and long-term growth that persisted even after the policy was no longer actively enforced. Shen et al. (2020), also found that China's policy of limiting exports of rare earth elements (REE) commodities succeeded in significantly increasing domestic processing of REE.

## Method

Public policy evaluation and reform are integral components of the policy cycle. It is imperative to go through the process particularly when policies prove ineffective or yield inefficient outcomes (Dye, 2016). Addressing the impacts on various stakeholders, especially those adversely affected by trade policies, is a central aspect of reform (Gasiorek et al., 2019; Lamp, 2018). Notably, evaluation and reform align with principles of good governance (Kirkpatrick & Parker, 2004a).

In the pursuit of policy evaluation, the regulatory impact assessment (RIA) serves as a systematic approach to critically analyse the positive and negative effects of existing and proposed regulations and non-regulatory alternatives (OECD, 2008; OECD, 2012; OECD, 2020). Employing consistent technical analysis, RIA aids in identifying policies necessary to achieve defined goals (Baldwin et al., 2011), involving six major steps outlined in Figure 1.

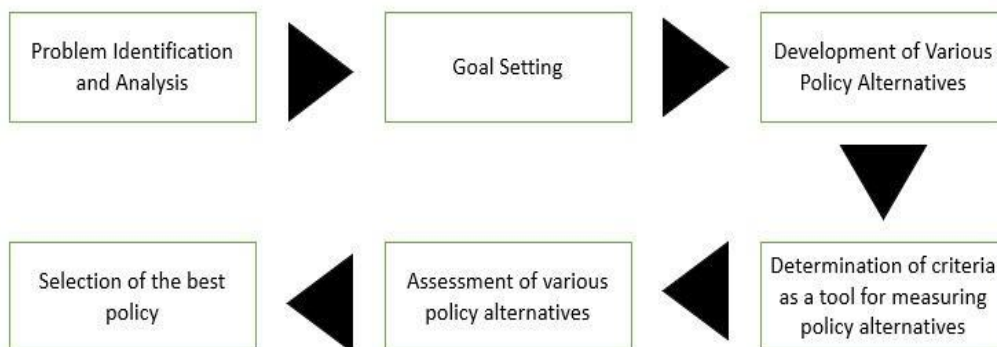


Figure 1. Public policy research framework

To enhance the credibility of the assessment, this research engages experts and employs linear models multi-criteria analysis (MCA) for selecting policy alternatives, given its capacity to consider multiple qualitative options (Dodgson et al., 2009; Gamper &

Turcanu, 2007). In the survey, experts are presented with criteria to assess policies, ranking them, and converting the rankings into weights using a modified Borda count (Emerson, 2013). Criteria are assigned values from  $n$  to 1 based on their ranking.

Additionally, experts provide opinions on policies aiming for equitable and sustainable downstreaming, ranking them against each criterion. These rankings are then converted into significance using the Borda count. After collecting criterion and policy weighting data, we aggregate experts' preferences with the geometric mean (Krejčí & Stoklasa, 2018). This survey specifically targets Indonesian professionals and researchers with a minimum of a master's degree, actively involved in or having published research on industrial policy. Through purposive sampling, responses from 15 experts are obtained, contributing to the determination of optimal short-term and long-term policy alternatives.

## **Result and Analysis**

The initial phase of our research involves problem identification and analysis. This entails mapping existing policies to discern successful implementations. Lessons drawn from these successes enable the identification of policies that have fallen short of their objectives due to suboptimal implementation.

Through this analysis, we can assess gaps in policies, informing recommendations for additional measures that the government should contemplate to achieve subsequent objectives. We find that the set of downstreaming policies can be categorised into three distinct groups based on implementation and achievement:

a. Implemented policies that achieved their objectives

*i.* Nickel ore export ban

In 2009, Indonesia banned raw nickel ore exports to boost domestic economic value. Although partially lifted in 2017, a stricter ban in early 2020, driven by Joko Widodo's political will. The policy significantly lowered domestic nickel prices, attracting foreign investors. Nickel-rich regions like Morowali are reindustrialising as a result, experiencing a significant increase in manufacturing value added, from 14% of GDP in 2010 to 70% in 2020.

*ii.* Tax incentives for downstream nickel processing industry

The government also incentivised investment in the strategic downstream sector through Minister of Finance Regulation No 130 of 2020. The regulation provides a tax holiday, reducing the corporate income tax from 50% for 5 years to 100% for 20 years for investors. Together with the export ban, the policy contributes to a fourfold increase in Morowali's FDI from 2019 to 2022, driven by smelter construction. This increasing investment brings significant positive impacts in Morowali.

b. Implemented policies that have not achieved their objectives

*i.* Cooperation between enterprises and local business

Minister of Investment Regulation No. 1 of 2022 stipulates the obligation for investors receiving tax facilities, to partner with local businesses (subcontracting, franchising, and others) with the goal of regional economic empowerment. Nonetheless, the implementation has not fully achieved the target. Industries tend to partner with small businesses coming outside the region, as in the case of Morowali.

*ii.* Tax revenue sharing from central to local government

Indonesia has a tax revenue sharing scheme to local and central government, regulated in Government Regulation No 55 of 2005 and Minister of Finance Regulation No 86 of 2022. As the biggest contributor to tax revenue, the income tax allocation scheme,

however, only gives 20% of the revenue to local governments, with 8% for the province and 12% for district/city government. Even worse, corporate income tax is not included in the sharing scheme, resulting in local governments receiving a relatively small portion compared to central revenues from investments in the regions.

*iii.* Environmental policy to mitigate the impact of industrial environmental pollution

The Indonesian government has established environmental policies to mitigate the impact of industrial air pollution through Law No. 32/2009 on Environmental Protection and Management, Government Regulation No. 41/1999 providing air pollution control standards and Minister of Environment and Forestry Regulation No. P.20/2018 strengthening regulations related to air quality management. Although these policies are in place, their implementation has not been optimal, mainly due to ineffective law enforcement. Further efforts are needed to ensure consistent law enforcement.

c. Policies that do not exist and need to be developed

i. Policy to enhance local productivity

Achieving equitable outcomes requires empowering the local communities in Morowali. Current policies did not empower local communities since existing local companies are concentrated in low-productivity sectors such as trade. Low worker productivity can be resolved with industry as a labor training to stimulate the formation of local enterprises in productive sectors such as tapping EV battery supply chains. Other policies such as providing hard infrastructure can help export-oriented local enterprises, which provide a large number of jobs and pay above-average salaries due to their relatively high productivity according to World Bank (2021).

ii. Long term policy on technology self-reliance

The equitable distribution of added value from the downstream process is heavily influenced by technology. Currently, foreign investors own the technology, leading to the majority of income accruing to them. To ensure that local communities benefit significantly from the value-added investment, it is crucial to achieve technological self-reliance in the long term. According to ADB research in 2023, there are no FDI spillovers in the manufacturing sector in Indonesia, underscoring the necessity for additional strategies to facilitate technology transfer. Surprisingly, there is still no specific policy in Indonesia regarding technology transfer. Thalib (2016) compared Indonesia's technology transfer regulations to those of China and revealed that Indonesia's regulations have been ineffective in promoting technology transfer, showing a 'tendency' to rely solely on foreign investment.

iii. Promoting national key industry players through financing local business in the productive sector

To encourage businesses in high-productivity sectors with the potential for technological self-reliance, (e.g. in the EV battery ecosystem), policy support is needed. This is because the scale of business to enter the high-productivity sector is generally no longer micro or small, at least a medium-sized business with credit needs that are also small. Meanwhile, the KUR scheme (people enterprise credit) is more intended for small and micro businesses with a relatively low credit ceiling. This limitation in financial support was also found by the World Bank (2023). According to Indonesia's Enterprise Survey 2023, access to financing is the number one business climate barrier faced by Indonesia, with 29% of business respondents citing it as the biggest obstacle.

iv. Price control for protecting upstream industry

One unintended consequence of export ban in pushing downstreaming is the loss of foreign demand. Without it, the domestic price of nickel significantly fell, hurting domestic miners. Losers from trade need to be compensated, if the government would

like to achieve an equitable outcome. Government can set a floor price and subsidise the gap with direct assistance, give retraining to the workers to suit new industry jobs, and loosen the export ban to compensate for the loss.

#### Policy Alternatives Assessment Criteria

With the MCA framework, various policy options will be evaluated through several criteria to support holistic policy formulation that leads to a more equitable and sustainable downstreaming. The projected impacts of each policy option will be examined using several criteria in Table 1.

Table 1. Policy alternatives assessment criteria

Criteria	Description
Effectiveness	How well does the policy promote equitable distribution of downstreaming's positive impacts in Morowali.
Government capacity	The compatibility of policy with the administrative capacity of governments for planning, implementing, and overseeing the implementation.
Government budget	The extent to which each policy requires budget support from the government to be implemented.
Public acceptability	How big the public will support the policy.
National investor response	How far the domestic business players support and approve the policy.
Foreign investor response	How far the foreign investors support and approve the policy.

#### Policy alternatives reviewed

We then examine two groups of policies, short-term and long-term, in an effort to promote equitable and sustainable downstreaming. Due to the complexity and time required to achieve these goals, emphasis is placed on long-term policies. However, there are short-term policy options that have the potential to have a positive impact on equitable and sustainable downstreaming. Short-term policies are defined as measures that the government can take within the next 1-3 years, making an impact on local communities in a relatively short period of time. While long-term policies, which can be taken in the next 4-10 years, are geared towards significant impacts for local communities although they take longer to be recognised.

Table 2. Policy Alternatives to Achieve Equitable and Sustainable Downstreamisation

Policy Alternative	Description
Short-term policies	
Revise the revenue sharing scheme distribution scheme	Government reallocates the revenue sharing scheme, increasing the portion received by local governments. Currently, the scheme focuses more on sharing revenue from personal income tax such, while corporate income tax remains heavily distributed for the central government.
Institute a downstream fund that jointly managed by the community, local	Investors in IMIP are required to allocate a portion of their earnings (e.g. 1%) to create a downstream fund institution, jointly managed by the representatives of local community, local government, and IMIP. Main

government, and IMIP	allocation of the fund is to provide working capital on local businesses such as local companies that are subcontract partners in IMIP). The remainder are for social programmes such as in the education, health, and environment sectors for the Morowali community.
Utilise the super tax deduction for companies providing training for local communities	The Ministry of Finance and the Ministry of Manpower promotes and strengthens the currently implemented super tax deduction incentive policy, a scheme encouraging companies to conduct training and research programmes by reducing the burden of their taxable income.
Increased special allocation fund (DAK) for infrastructure	Government increases DAK for infrastructure development at downstreaming regions, as it requires adequate infrastructure.
Encourage businesses to intensify CSR activities	Governments persuade investors to make more significant contributions, increasing CSR activities in education, health, and the environment.
Long-term policies	
Additional capital by the central government to the downstream fund institution	The established downstream fund can be further strengthened with financial support from the central government. A capital injection allows the institution to provide strategic equity financing for regional businesses in more diversified sectors.
Require foreign investors in to transfer technology to local companies	Improving the technological capabilities of the domestic industry to create greater added value by setting rules to transfer patents, intellectual properties on production techniques, or through a joint venture.
Requiring technology transfer for incentive extension	Encouraging regional companies to master downstream industries' technology, similar to the previous one. However, it differs by not imposing unilateral obligations on investors. Instead, it offers incentives as a motivator for investors to willingly transfer technology.
Local Government Establishes BUMD to Produce EV Battery Components	Local governments encourage a shift to high-value sectors like EV battery component production by establishing a regional government-owned enterprise (BUMD). This allows resource rich regions such as Morowali to play a significant role in the EV battery supply chain, facilitating the commercialization of knowledge spillovers from foreign investors.
The government appointed IMIP as one of the future super-priority SEZs that is entitled to various additional supports from the government	The government's push for Special Economic Zones (SEZs) to attract investments has fallen short of expectations. Proposing Morowali, especially the IMIP, as a Super Priority SEZ could boost local and national business involvement. By providing additional government support, like financial aid and technological assistance, the goal is to redirect the investment spotlight from foreign entities to encouraging participation from local and national investors.

Implementing a downstream fund jointly managed by the community, local government, and IMIP, as exemplified by PT Freeport Indonesia's initiative, becomes a pivotal policy for community development. This scheme, constituting 1% of the company's income, empowers local communities in Papua through a strategic partnership fund. Another critical policy involves increasing the special allocation fund (DAK) for infrastructure, addressing the persistent decline despite high regional demand, reaching 6-9 times the

allocated value. Encouraging businesses to intensify CSR activities is imperative, recognizing the link between investor success and community support. While investors in IMIP have initiated CSR activities, there is room for enhancement to align with ideal community engagement standards.

In the long run, the central government's additional capital infusion into the downstream fund holds strategic significance, enabling impactful investments like supporting companies entering the electric battery chain production. To promote technological advancement, the policy mandates foreign investors in PT. IMIP to transfer technology, such as HPAL technology, to local companies. Acknowledging potential resistance, this initiative aims to balance interests. Requiring technology transfer for incentive extension adds complexity to the policy landscape. Currently, foreign investors enjoy tax incentives, like a 10-year tax holiday, which can be extended by transferring technology to local firms, providing both incentives and decision-making flexibility. This approach incentivizes foreign investors to contribute to local technological capabilities while maintaining flexibility in their decision-making processes. The interplay between technology transfer and incentive extension strategically balances the interests of foreign investors and the local technological landscape.

#### Policy Alternative Analysis Using RIA Method

The policy alternatives elaborated above will be analysed based on the policy criteria as listed in the previous section. Experts from within the Ministry of Investment/BKPM ranked each of the proposed criteria based on a priority scale, with the results in Table 3. The criteria of effectiveness in achieving equitable and sustainable goals received the highest weight with 27.46% and 20.40%, followed by government capacity and government budget. Experts' preferences tend to place the interests of communities and businesses (both foreign and domestic) at the last priority of policy assessment.

Table 3. Policy criteria preference survey results

Criteria	Significance
Effectiveness in achieving sustainable equitable goals	27,46%
Government capacity	20,40%
Government budget	15,15%
Public acceptance	14,11%
National investor response	13,25%
Foreign investor response	9,63%

#### Short-term Policy Alternative Recommendations

Experts support the revision of the tax revenue sharing scheme as a top priority in short-term policy options. Currently, inequity is seen in the division of corporate income tax (PPh) between the central and local governments. This revision involves two main aspects. First, to include corporate income tax in the distribution of local tax DBH with an initial percentage of 10%. Further study is needed to determine the optimal percentage, considering the fiscal needs of the central government. The second aspect involves an increase in the portion of individual taxpayer income tax that is shared with the regions, from 20% to 25%, with an allocation of 10% to provincial governments and 15% to city/regency governments. The realisation of this reformulation requires changes to Government Regulation No. 55 of 2005 and Minister of Finance Regulation No. 86 of 2022 related to Government Budget Balance and Revenue Sharing Fund Management.



Table 4. Short-term Policy Preference Survey Results

Short-term Policy	Weighted Average
Revised DBH distribution scheme	4,80
Establishment of a downstream fund management institution	4,59
Utilising the super tax deduction scheme	3,31
Increasing DAK for infrastructure development	3,41
Intensifying CSR activities	2,99

Experts support the establishment of a downstream fund management institution as a short-term priority policy. This institution, jointly managed by the community, local government, and IMIP, would encourage IMIP investors to allocate a portion of their revenue. The funds would be used for social programmes (40%) and business capital for local businesses.

This institution acts as venture capital, providing equity financing to businesses that have agglomerated. The government can facilitate an agreement between IMIP, the local government, and the community to encourage the allocation of 1% funds from IMIP investors, providing long-term benefits through positive relationships with the community and increased community capacity in the IMIP supply chain. Not only that, the fund can also be used for social and environmental purposes, empowering the local community and cleaning pollution. The government can increase the rate of which companies contribute based on emitted pollution, acting as a price for pollution to control environmental degradation.

Long-term Policy Alternative Recommendations

Experts recommend the establishment of an investment funding agency by the central government and require technology transfer for the extension of incentives. The government can facilitate the establishment of an Investment Financing Institution (LPI) within the Ministry of Investment's SMV to support strategic national companies and regional companies with high value-added productive sectors in the form of equity financing. The expansion of working capital target sectors is important to lift the regional economy. However, more productive sectors also come with higher risks. Without policy intervention through funding, local entrepreneurs will find it difficult to enter these sectors. Examples of sectors that can be targeted by the LPI include the base metal sector, EV batteries, and the fish processing industry. To accomplish this, it is necessary to revise Presidential Regulation No. 63 of 2021 to give the Ministry of Investment the authority and resources to establish SMVs.

Table 5. Long-term Policy Preference Survey Results

Long-term Policy	Weighted Average
Establishment of a Special Mission Vehicle of the Ministry of Investment through an investment funding institution	4,54
Requires technology transfer for incentive extension	4,03
Requires foreign companies to conduct technology transfer	3,78
Local government creates regional owned enterprises (BUMD) to produce	3,12

EV battery components	
Establishment of downstream areas as one of the super-priority SEZs	3,40

In addition, another long-term policy recommendation is to require technology transfer as a condition for the extension of fiscal incentives to improve local technology acquisition and encourage technology transfer. Although sensitive for foreign investors, the government may opt for a persuasive approach by incentivizing investors who share some of their technology with local companies, without requiring the transfer of all foreign technology patents. Revisions to regulations such as Minister of Finance Regulation 130/10/2020 and Minister of Investment/Head of BKPM Regulation No. 7 of 2020 need to be made to support this policy, which can be realised through drafting new regulations detailing investment incentives, including additional incentives for foreign investors who collaborate in technology transfer.

### Conclusion

Our research shows that although downstreaming policy has brought positive impacts, the results experienced by local communities and governments are not fully equitable and sustainable. Using regulatory impact assessment, our study identifies several policy reforms that the government needs to consider for the downstreaming policy. In the short term, the government needs to revise the Revenue Sharing Fund (DBH) scheme from tax revenue to local governments and the government needs to require investors to partner with local businesses. In the long term, the central government needs to establish a special mission vehicle (SMV) of the Ministry of Investment in the form of an investment funding institution to provide more strategic support to regional entrepreneurs, and the government also needs to require technology transfer for incentives for foreign investors. Through these reforms, it is expected that downstreaming will be more equitable and sustainable, not only for the central government and investors but also for local governments and local communities.

### References

- Baldwin, R., Cave, M., dan Lodge, M. (2011). Cost-benefit analysis and regulatory impact assessment. Dalam *Understanding Regulation: Theory, Strategy, and Practice* (2nd Edition). DOI: <https://doi.org/10.1093/acprof:osobl/9780199576081.003.0015>
- Choi, J., & Levchenko, A. A. (2021). The long-term effects of industrial policy (No. w29263). National Bureau of Economic Research.
- Chen, J. (2023). A Comparative Study of ESG Disclosure based on Industry and Food of A-Shares. *Highlights in Business, Economics and Management*, 11, 19–25.
- Desdiani, N. A., Maizar, F. A., dan Rezki, J. F. (2023). Larangan Ekspor Mineral Indonesia dan Implikasinya. *Special Report Vol. 1 No. 2, Juni 2023. LPEM FEBUI*. URL: <https://www.lpem.org/id/special-report-larangan-ekspor-mineral-indonesia-dan-implikasinya/>
- Dodgson, J. S., Spackman, M., Pearman, A., & Phillips, L. D. (2009). *Multi-Criteria Analysis: A Manual*. London School of Economics.
- Dye, T. R. (2016). *Understanding public policy* (A. Dodge, Ed.; 15th ed.). Pearson.
- Emerson, P. (2013). The original Borda count and partial voting. *Social Choice and Welfare*, 40, 353-358.
- Gamper, C. D. & Turcanu, C. (2007). On the governmental use of multi-criteria analysis. *Ecological Economics*, 62(2), 298-307. DOI: 10.1016/j.ecolecon.2007.01.010

- Gasiorek, M., Garrett, J. M., dan Serwicka, I. (2019). *Winners and losers from international trade: What do we know and what are the implications for policy?* Briefing Paper 33, UK Trade Policy Observatory.
- Juhász, R., Lane, N., & Rodrik, D. (2023). *The New Economics of Industrial Policy*. <https://doi.org/10.3386/w31538>
- Juhász, Réka and Lane, Nathaniel and Oehlsen, Emily and Pérez, Verónica C., *The Who, What, When, and How of Industrial Policy: A Text-Based Approach* (November 20, 2022). Available at SSRN: <https://ssrn.com/abstract=4198209> or <http://dx.doi.org/10.2139/ssrn.4198209>
- Kirkpatrick, C., & Parker, D. (2004). Regulatory impact assessment and regulatory governance in developing countries. *Public Administration and Development*, 24(4), 333–344. <https://doi.org/10.1002/pad.310>
- Krejčí, J., & Stoklasa, J. (2018). Aggregation in the analytic hierarchy process: Why weighted geometric mean should be used instead of weighted arithmetic mean. *Expert Systems with Applications*, 114, 97-106.
- Lamp, N. (2018). How should we think about the winners and losers from globalization? Three narratives and their implications for the redesign of International Economic Agreements. *European Journal of International Law* 30(4), 2019, 1359-1397. DOI: <http://dx.doi.org/10.2139/ssrn.3290590>
- Lane, N. (2021). *Manufacturing Revolutions: Industrial Policy and Industrialization in South Korea*. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3890311>
- Liu, X., & Bae, J. (2018). Urbanization and industrialization impact of CO 2 emissions in China. *Journal of Cleaner Production*, 172, 178–186. doi:10.1016/j.jclepro.2017.10.156
- Lin JY and Chang HJ (2009). Should industrial policy in developing countries conform to comparative advantage or defy it? *Development Policy Review*, 27(5): 483–502. <https://doi.org/10.1111/j.1467-7679.2009.00456.x>
- OECD. (2008). *Building an Institutional Framework for Regulatory Impact Analysis (RIA): Guidance for Policy Makers*, OECD Publishing, Paris, <http://www.oecd.org/regreform/regulatory-policy/40984990.pdf> .
- OECD. (2012). *Recommendation of the Council on regulatory policy and governance*. OECD Publishing. <http://dx.doi.org/10.1787/9789264209022-en>
- OECD (2020). *OECD Digital Economy Outlook 2020*. Paris: OECD. Retrieved from <https://doi.org/10.1787/bb167041-en>
- Plastun, A., Makarenko, I., Khomutenko, L., Osetrova, O., & Shcherbakov, P. (2020). SDGs and ESG disclosure regulation: is there an impact? Evidence from Top-50 world economies. *Problems and Perspectives in Management*, 18(2), 231–245. [https://doi.org/10.21511/ppm.18\(2\).2020.20](https://doi.org/10.21511/ppm.18(2).2020.20)
- Rodrik, D. (2013). Unconditional convergence in manufacturing. *Quarterly Journal of Economics*, 128(1), 165-204.
- Shen, Y., Moomy, R., & Eggert, R. G. (2020). China's public policies toward rare earths, 1975–2018. *Mineral Economics* 33: 127–151.
- Suska, S. (2012). Prinsip regulatory impact assessment dalam proses penyusunan peraturan perundang-undangan sesuai UU nomor 12 tahun 2011. *Jurnal Konstitusi*, 9(2), 357-379. DOI: <https://doi.org/10.31078/jk926>
- Tang, K. L (1998). East Asian newly industrializing countries: Economic growth and quality of life. *Social Indicators Research* 43, 69–96. DOI: <https://doi.org/10.1023/A:1006866508364>
- Thalib, A. (2016). Technology Transfer In Indonesia And China: A Comparative Study. *Jurnal Hukum IUS QUIA IUSTUM*, 23(2), 251–270. <https://doi.org/10.20885/iustum.vol23.iss2.art5>

631 *Into Sustainable and Equitable Nickel Downstreaming in Indonesia: What Policy Reforms are Needed?*

Verico, Kiki. (2018) Modification of the Regulatory Impact Assessment on Indonesia's Economic Policies. *Economics and Finance in Indonesia: Vol. 64: No. 1, Article 3*. DOI: 10.47291/efi.v64i1.579

World Bank. (2021). *Global Economic Prospects, June 2021*. Washington, DC: World Bank. doi:10.1596/978-1-4648-1665-9

World Bank. (2023). *Enterprise surveys: Indonesia 2023*. World Bank Enterprise Survey. <https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/country/Indonesia-2023.pdf>