INDUSTRIAL MINING POLICY, ROLE OF INNOVATION AND FIRM BUSINESS PERFORMANCE IN INDONESIA MINING COMPANIES

AGUS JAYANA

SULTAN IDRIS EDUCATION UNIVERSITY

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ABSTRACT

This study endeavors to examine the complex correlation between industrial mining policy (IMP), firm business performance (FBP), and innovation (IN). A positivist approach is employed in this research, utilizing a cross-sectional survey to gather primary data. The collected data is subjected to quantitative analysis using partial least squares structural equation modeling (PLS-SEM). The specific focus of this investigation centers around Indonesian mining firms possessing mining business permits (IUP), with a total sample size of 385 respondents who participated in the survey. The findings indicate all constructs and dimensions are categorized as substantial and have predictive relevance because they have a value of $R^2 \geq 0.75$ and $Q^2 \geq 0$. This study also demonstrates that innovation acts as a mediator between the industrial mining policy and firm business performance, since the path coefficient of the indirect effect of IMP → IN → FBP (0.496) is higher than the direct effect of IMP → FBP (0.323), with a t-statistic value > 1.96 and a p-value < 0.05. In sum, this research emphasizes the significance of innovation in enhancing the positive correlation between the industrial mining policy and firm business performance within the Indonesian mining sector. By embracing innovative strategies and technologies, mining companies can optimize their operations, enhance productivity, and mitigate environmental repercussions. Additionally, these findings hold implications for government policymakers, offering valuable insights for future public policy formulation concerning the mining industry. Mining companies are encouraged to prioritize continuous improvement and innovation, as these factors are crucial for the relationship between industrial mining policy and firm business performance.

Keywords: *industrial policy, innovation, firm business performance, mining industry, structural equation modeling*

DASAR INDUSTRI PERLOMBONGAN, PERANAN INOVASI DAN PRESTASI PERNIAGAAN DALAM SYARIKAT PERLOMBONGAN INDONESIA

ABSTRAK

Kajian ini berusaha untuk mengkaji korelasi kompleks antara dasar perlombongan industri (IMP), prestasi perniagaan firma (FBP), dan inovasi (IN). Pendekatan positivis digunakan dalam penyelidikan ini, menggunakan tinjauan keratan rentas untuk mengumpul data primer. Data yang dikumpul tertakluk kepada analisis kuantitatif menggunakan pemodelan persamaan struktur kuasa dua terkecil separa (PLS-SEM). Tumpuan khusus penyiasatan ini tertumpu kepada firma perlombongan Indonesia yang memiliki permit perniagaan perlombongan (IUP), dengan jumlah saiz sampel sebanyak 385 responden yang mengambil bahagian dalam tinjauan itu. Dapatan menunjukkan semua konstruk dan dimensi dikategorikan sebagai substansial dan mempunyai kaitan ramalan kerana ia mempunyai nilai $R^2 \geq 0.75$ dan $Q^2 \geq 0$. Kajian ini juga menunjukkan bahawa inovasi bertindak sebagai pengantara antara dasar perlombongan industri dan prestasi perniagaan firma, sejak pekali laluan kesan tidak langsung IMP → IN → FBP (0.496) adalah lebih tinggi daripada kesan langsung IMP → FBP (0.323), dengan nilai t-statistik > 1.96 dan nilai $p < 0.05$. Ringkasnya, penyelidikan ini menekankan kepentingan inovasi dalam meningkatkan korelasi positif antara dasar perlombongan industri dan prestasi perniagaan firma dalam sektor perlombongan Indonesia. Dengan menerima strategi dan teknologi yang inovatif, syarikat perlombongan boleh mengoptimumkan operasi mereka, meningkatkan produktiviti dan mengurangkan kesan alam sekitar. Selain itu, penemuan ini memberi implikasi kepada penggubal dasar kerajaan, menawarkan pandangan yang berharga untuk penggubalan dasar awam masa hadapan berkaitan industri perlombongan. Syarikat perlombongan digalakkan untuk mengutamakan penambahbaikan dan inovasi berterusan, kerana faktor-faktor ini penting untuk hubungan antara dasar perlombongan industri dan prestasi perniagaan firma.

Keywords: *dasar perlombongan industri, inovasi, prestasi perniagaan syarikat, industri perlombongan, pemodelan persamaan struktur*

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LIST OF ABBREVIATIONS

ADHB	Based on the current price
ADHK	Based on constant price
AMDAL	Environmental Impact Analysis
ANTAM	PT. Aneka Tambang
APBI-ICMA	Indonesian Coal Mining Association
APBN	State revenue and expenditure budget
ASEAN	Association of Southeast Asian Nations
ASM	Artisanal and Small-Scale Mining
ASN	State Civil Apparatus
AVE	Average variance extracted
BAI	PT Borneo Alumina Indonesia
BATAN	National Nuclear Energy Agency
BBI	Proud to be Made in Indonesia
BBM	Fuel oil
BKPM	Investment Coordinating Board
BLT	Cash Direct Assistance
BLU	Public service agency
BPS	Central Bureau of Statistics
BTPKLWN	Cash Assistance for Street Vendors, Small Stalls, and Fishermen
BUMD	Regional-owned enterprises

BUMN	Indonesian State-Owned Enterprise
CA	Competitive Advantage
CBL	PT Ningbo Contemporary Brunp Lygend
CB-SEM	Covariance-based structural equation modeling
CFA	Confirmatory factor analysis
CGA	Chemical Grade Alumina
Covid-19	Corona Virus Disease 19
CoW	Contract of Work
DMO	Direct Market Obligation
DMO	Domestic Market Obligation
DPR	House of Representatives
EFA	Exploratory factor analysis
EM	Environmental Management
ESDM	Energy and Mineral Resources
ESG	Environmental, Social, and Governance
EU	Europe Union
EV	Electric vehicle
FBFP	Firm Business Financial Performance
FBNFP	Firm Business Non-Financial Performance
FBO	Financial Benefit Optimization
FBP	Firm Business Performance
FeNi	Ferro Nickel
FHT	East Halmahera Ferronickel
GCNC	Global Coal Newcastle Index

GDP	Gross Domestic Product
GDP	Gross domestic product
GoF	Goodness of Fit
HBA	Coal price reference
HR	Human resources
IBC	PT Industri Battery Indonesia (Indonesia Battery Corporation)
ICI	Indonesia Coal Index
IEA	International Energy Agency
IMF	International Monetary Fund
IMP	Industrial Mining Policy
IN	Innovation
Inalum	PT Indonesia Asahan Aluminium
IoT	Internet of things
IP	Industrial Policy
IPN	National development index
IUP	Mining business permit
IUPK	Special Mining Business Permit
JIIPE	Java Integrated Industrial and Ports Estate
K3	Occupational Health and Safety
KEK	Exclusive economic zone
KK	Contract of work
KM	Knowledge Management
KPC	PT. Kaltim Prima Coal (KPC)
KUR	People's Business Credit

LPE	Legal and Policy Environment
LSM	Large Scale Mining
Minerba	Mineral and Coal
MO	Market Orientation
NEX	Newcastle Export Index
NGO	Non-governmental organization
NPI	Nickel Pig Iron
NPL	Non-performing loan
OECD	The Organization for Economic Co-operation and Development
OLS	Ordinary least squares
P3FH	East Halmahera Ferronickel Plant Construction Project
Pemda	Local Government
PEN	National Economic Recovery
PI	Process Innovation
PIN	Product Innovation
PJBTL	Power Purchase Agreement
PKH	Family Hope Program
PKP2B	Coal mining concession work agreement
PLN	State Electricity Company
PLS	Partial Least Square
PLS-SEM	Partial Least Square structural equation modeling
PMN	State capital participation
PMR	Precious Metal Refinery
PMT	Post Mining Transition

PMTB	Gross Fixed Capital Formation
PNBP	Non-Tax State Revenue
PP	Government Regulation
PSN	National Strategic Project
PTBA	PT. Bukit Asam
PTFI	PT. Freeport Indonesia
PUSHEP	Center for Energy and Mining Law Studies
qoq	Quarter on quarter
R&D	Research and development
RI	Republic of Indonesia
RKAB	Work Plan and Cost Budget
RMSR	Root mean square residual
ROS	Return on sales
RPJMN	Medium-Term Development Plan
RPP	Draft implementing regulations
S1	Bachelor
S2	Master
S3	Doctor
SASCA	Support adjusted sustainable competitive advantage.
SBO	Socioeconomic Benefit Optimization
SEM	Structural equation modeling
SGAR	Smelter Grade Alumina Refinery
SM	Strategic Management
SME	Small and medium-sized enterprises

SPSS	Statistical Package for Social Sciences
SRMR	Standardized root mean square residual
STDEV	Standard Deviation
Telkomsel	PT Telekomunikasi Selular
THR	Holiday Allowance
TNi	ton Nickel
UK	The United Kingdom
UMKM	Micro, small and medium enterprises
US	The United States
USGS	US Geological Survey
UU	Law
UUD	Basic Law
VAF	Variance accounted for
VAS	Visual Analog Scale
yoy	Year on Year

APPENDIX LIST

CHAPTER 1

INTRODUCTION

1.1 Introduction

The mining enterprise holds a paramount position in numerous nations' economic advancement, and Indonesia is no exception to this impactful trend (F. Z. Fahmi et al., 2016; Malahayati et al., 2021). Scholars and policymakers alike have displayed a keen interest in unraveling the intricate connection between industrial mining policies and the performance of mining firms (Gamu et al., 2015; Karakaya & Nuur, 2018). The recognition of innovation as a principal catalyst for firm performance across various sectors has recently gained substantial traction (Bocquet et al., 2017; K.-H. Lee & Min, 2015). Consequently, the focal point of this study is to delve deep into the interplay between industrial mining policies and firm performance within the mining companies of Indonesia. Moreover, it explicitly explicitly explores innovation's mediating role in this dynamic relationship.

Indonesia, a land rich in mineral resources, has a flourishing mining sector that plays a crucial role in job creation, export revenues, and government income (S. H. Park et al., 2016; Tritto, 2023). However, this industry has its fair share of challenges, encompassing environmental concerns, social impacts, and regulatory frameworks (J. Li et al., 2019; Mancini & Sala, 2018). To address these challenges, Indonesia has implemented a comprehensive industrial mining policy framework, which sets forth guidelines and regulations governing mining operations, environmental protection, and social responsibilities (Hirons, 2020; Langston et al., 2015).

The comprehension of the impact of these policies on the performance of mining companies and policymakers holds immense significance. Moreover, innovation is a pivotal factor that amplifies a firm's competitive edge and overall performance (Azeem et al., 2021; Yumei et al., 2021). By delving into the intricate interplay between innovation and the mediating role it assumes, this research aims to illuminate the influence of industrial mining policies on the performance of firms within the Indonesian mining sector.

This study meticulously examines how mining companies navigate the realm of policy incentives and constraints, strategically embracing innovative practices and cutting-edge technologies to augment their operational efficiency, productivity, and sustainability. Exploring this mediating role unfurls invaluable insights into the potential of innovation to propel business performance within the mining domain. The ramifications of this research extend beyond the confines of academia, resonating with policymakers, mining companies, and various other stakeholders entrenched within this dynamic industry.

It provides a deeper understanding of the intricate relationship between industrial mining policy, innovation, and firm performance, thus informing policy formulation, decision-making, and strategic planning within the mining sector (Chand et al., 2020; Komljenovic et al., 2015). Ultimately, this study aims to contribute to the existing literature on the connection between industrial mining policy, innovation, and firm business performance, offering context-specific insights to develop effective policies and strategies for sustainable mining practices and improved firm performance in Indonesia (Andreassen et al., 2018; Ghassim & Foss, 2021).

1.2 Research Background

Indonesia, a nation blessed with abundant natural resources, heavily relies on its thriving mining sector for economic development (Hajad et al., 2023; Rokhmad, 2020). The mining industry encompasses diverse sectors, including coal, minerals, oil, and gas, and serves as a significant driver of employment, export revenue, and overall economic growth (Ericsson & Löf, 2019). Thus, it is imperative to uphold the performance of mining companies to ensure the sustained advancement of Indonesia's economy. The significance of the mining industry to Indonesia's economic progress cannot be overstated. It provides many individuals with direct and indirect employment opportunities and fosters an extensive value chain (A. Kumar et al., 2022).

Furthermore, mining companies contribute substantial export revenue, bolstering the nation's trade balance and foreign exchange reserves (Besada & Golla, 2023; Signé & Johnson, 2021). The revenue from mining operations is pivotal in

bolstering various economic sectors, encompassing infrastructure development, education, healthcare, and social welfare programs (Becker et al., 2017; Pooe, 2021). This financial influx sustains these sectors and enables their growth and enhancement, ensuring their continued progress and societal well-being.

Ensuring the continual high performance of mining companies is crucial to sustaining their positive impact on Indonesia's economy (Dutu, 2016; Tritto, 2021). The performance of these firms directly influences their ability to generate profits, attract investments, and create job opportunities. A well-performing mining sector enhances investor confidence, leading to increased capital inflows, technological advancements, and infrastructure development. In addition, the prosperous performance of mining enterprises empowers them to meet their responsibilities, encompassing the payment of taxes and royalties (Cust, 2018; De Haan et al., 2020). The interconnectedness of these factors leads to a noteworthy augmentation in government revenue and the holistic well-being of the general populace.

Minerals and coal downstream aim to prevent the outflow of funds through export concentrates (Finasisca & Hayati, 2020; Ika & Setiawan, 2018). The subsequent objective is to enhance the contribution of the mineral and coal (Minerba) law to the public good and social justice. Conversely, the objective of downstream activities indirectly creates employment opportunities for Indonesians. Additionally, downstream minerals and coal intend to generate a multiplier effect on employment and human welfare (Rachim, 2020; Sulista & Rosyid, 2022).

Another objective is strengthening Indonesia's bargaining position in the global economy, considering its strategic minerals and byproducts. Several holders of mineral mining business licenses (IUP) who have built smelters take pride in leaving a legacy for the country, mainly as Indonesia garners increasing recognition (Lacey et al., 2015; Suryadinata & Negara, 2023). Notably, it controls nickel and its byproducts in the downstream sector, which serve as raw materials for electric vehicle batteries—the dominant force in the future automotive industry (Dall-Orsoletta et al., 2022; Jones et al., 2023).

The new Minerba Law is also expected to promote the development of minerals and coal with added value. This new law separately regulates the definition of increasing the added value of minerals and coal, in contrast to the previous legislation. Furthermore, the new Minerba Law encompasses a definition of coal management and utilization (Amatullah et al., 2020; Listiyani & Hayat, 2019). In its implementation, the amendments to Law No. 4/2009 also consider economic feasibility and market access (forward linkage), which were not previously addressed by the same law (Atteridge et al., 2018; Lieder & Rashid, 2016).

However, greater scrutiny is necessary for the detailed regulations in government decrees to ensure the proper execution of mineral value-added activities (P. K. Jain, 2022; Korinek & Ramdoo, 2017). While the new Minerba Law includes numerous favorable provisions for business entities, permit holders must pay special attention to determining criminal sanctions and heavier fines. The possibility of a maximum prison sentence of five years and a fine of up to Rp100 million is expected

to encourage business actors' compliance with laws and regulations (Fernando et al., 2023; Riche, 2021).

Consequently, all business actors must closely attend to drafting the government's implementing regulations (RPP). Suppose the law and the implementing regulations accommodate business entities' best practices and concerns and can be synchronized with other sectoral regulations. In that case, the new Minerba Law is believed to enhance the mining industry (Wajdi, 2021). Despite the weakened demand caused by the Covid-19 pandemic, it can stimulate mining activities to their fullest extent in the short term (Hartono et al., 2021; Mehta, 2020; Rajput et al., 2021).

Firm business performance encompasses the outcomes attained by mining companies in terms of financial indicators, operational efficiency, market share, competitive advantage, and sustainable growth (Bag & Omrane, 2022; Reverte et al., 2016). In the context of Indonesia, various factors influence the business performance of mining firms. Global demand and market dynamics significantly impact the business performance of mining companies in Indonesia (Kusuma et al., 2018; Litvinenko, 2020; Nasih et al., 2019).

The pricing of crucial commodities like coal, minerals, and natural gas is deeply influenced by the constantly shifting dynamics of the global market, which brings forth many changes and implications (A. Dwyer et al., 2011; Litvinenko, 2020). Consequently, their values are subject to perpetual fluctuations, influenced by various factors. Economic conditions, geopolitical factors, and shifts in global energy consumption patterns can affect the demand and profitability of mining products

(Hafner & Tagliapietra, 2020). Mining companies must adapt to changing market conditions to maintain their business performance.

Infrastructure development, including transportation networks, ports, and power supply, plays a critical role in supporting the operations of mining companies (Bhattacharyay, 2010; Oskarsson et al., 2021). Efficient logistics and reliable infrastructure improve business performance by reducing operational costs, ensuring timely product delivery, and enhancing competitiveness. The mining business has seen a definite transformation during the last few years. More and more attention is being paid to environmental and social duty. This shift underscores a heightened recognition of the critical importance associated with these aspects. Adherence to sustainable practices, responsible resource extraction, and community engagement are crucial for maintaining a positive reputation and securing the social license to operate. Mining companies prioritizing environmental and social responsibility are more likely to achieve long-term business performance (Månberger & Johansson, 2019).

Incorporating cutting-edge technologies and novel practices can profoundly influence mining companies' operational efficacy and overall business performance (Perifanis & Kitsios, 2023). Technological advancements in exploration techniques, mining equipment, automation, and digitalization can improve operational efficiency, reduce costs, and enhance safety (Sánchez & Hartlieb, 2020). Embracing innovation and investing in research and development can drive competitiveness and overall business performance. Furthermore, examining the mediating role of innovation adds a layer of understanding to the relationship between industrial mining policy and firm business performance. In the mining realm, innovation assumes a pivotal role,

facilitating the adaptation of companies to shifting market conditions, enhancing operational efficiency, and setting them apart from their rivals (Basile et al., 2021).

Innovation can take various forms in the Indonesian mining sector, such as technological advancements, process improvements, product development, and adopting sustainable practices. Mining companies that prioritize investment in research and development, actively cultivate a culture of innovation, and wholeheartedly embrace cutting-edge technologies are significantly more inclined to attain superior levels of business performance (X. Yu, 2017). It is imperative to acknowledge that the mining industry in Indonesia exhibits remarkable diversity, characterized by companies of varying sizes, distinct ownership structures, and diverse operational capacities. Factors such as access to financing, human resources capabilities, and proximity to infrastructure can also influence firm business performance among mining companies (Pinto et al., 2015).

The mediating role of innovation suggests that it acts as a mechanism through which industrial mining policy influences firm business performance. Effective policies that promote a conducive environment for innovation, such as research grants, tax incentives, and collaboration between industry and academia, can stimulate innovation within mining companies (Ma et al., 2021). Increased innovation can enhance business success by bolstering operational efficiency, optimizing cost-effectiveness, elevating product quality, and augmenting market competitiveness (Guo et al., 2023; Rejeb et al., 2021). Such a progression towards innovation empowers organizations to achieve superior outcomes and positions them favorably amidst a dynamic and competitive landscape.

Understanding the myriad factors influencing the operational success of mining companies in Indonesia holds paramount significance for policymakers, industry stakeholders, and the companies themselves (Cameron & Stanley, 2017). The complexity of this comprehension necessitates an exploration of the diverse facets that shape business performance within the mining sector. This comprehensive study delves into the interplay between industrial mining policies, innovation, and business performance. By doing so, it aims to offer invaluable insights into the potential economic avenues mining companies can explore in the Indonesian context. Furthermore, this underscores the profound importance of their contribution to nurturing a sustainable economy, accentuating the dual significance of their accomplishments and the nation's overall well-being.

However, there is a scarcity of studies that have focused on the relationship between industrial mining policy and firm business performance, particularly within the Indonesian mining sector. The unique characteristics of the mining industry, such as its susceptibility to policy changes and regulatory frameworks, warrant a comprehensive investigation into the influence of industrial mining policy on firm performance (Spitz & Trudinger, 2019). Although innovation has been acknowledged as a crucial driver of firm performance in various industries, its mediating effect in the relationship between industrial mining policy and firm business performance remains largely unexplored. Understanding how innovation mechanisms operate in the context of mining companies in Indonesia can provide valuable insights into how industrial mining policy influences firm performance (Martono et al., 2020).

1.3 Problem Statement

Industrial mining policies encompass a broad range of regulations, laws, and guidelines implemented by the government to regulate mining activities within the country effectively (Martono et al., 2020). These policies serve as a framework for mining companies to operate within and can significantly influence various aspects of their operations. Government policies regarding the mining industry will influence Indonesian mining companies' performance and business continuity. For instance, the publication of Law No. 4 of 2009 regarding Mineral and Coal Mining will undoubtedly affect the management of the mineral and coal mining industry.

A Production Operation Mining Business License (IUP) holder must enhance their products' value through treatment and purification at a smelter facility (Haryadi, 2017; Panggabean & Berawi, 2021). It is evident from a survey of multiple regions and business actors that various problems have emerged. This condition must be addressed as soon as possible to prevent more significant problems, ultimately negatively impacting mineral and coal mining investments and enhancing the general welfare of society (Febrianto, 2019; Pandyaswargo et al., 2021).

Enacting the Minerba Law is believed to positively affect economic growth and employment in Indonesia (Fernando et al., 2023). The presence of regulations on mineral and coal mining is the solution to several problems in mining governance to date. In general, the latest Minerba Law regulates four substances. It begins with efforts to enhance national mining governance. Second, it is characterized by the obligation to

divest 51% for foreign investment, which affirms the state's sovereignty over its natural resources and relates to the aspect of siding with the national interest (Lindblad, 2015).

This rule regulates legal certainty and ease of investment, two pillars of economic growth. It provides improved environmental management in mining enterprise management. This section emphasizes the sanctions for mining industry actors failing to meet environmental management obligations. Therefore, the greatest obstacle for the Indonesian government is the formulation of appropriate mining and processing regulations (Farida et al., 2020). The objective is to accommodate the needs of the Indonesian people without infringing on the rights of mining companies so that the existing regulations can significantly benefit both parties.

One critical area influenced by industrial mining policies is environmental standards. Mining operations exert significant pressure on the environment, resulting in many adverse effects, including deforestation, habitat destruction, soil erosion, and water pollution (Mao et al., 2018; Tiamgne et al., 2022). The intricate interplay between these factors underscores the profound environmental ramifications of mining activities. Industrial mining policies set forth environmental regulations and guidelines that mining companies must adhere to, aiming to minimize the negative environmental consequences of mining operations.

Adhering to environmental standards holds considerable sway over a company's business outcomes since non-compliance with regulatory mandates can incur penalties, sanctions, or even the temporary halt of mining activities (Pushkarna, 2015; Trinidad & Laguna, 2018). Conversely, proactive measures to exceed environmental standards

can enhance a company's reputation and social license, improving business performance (Dragomir & Dragomir, 2020; Poelzer et al., 2020).

Licensing procedures are another crucial aspect influenced by industrial mining policies. The process of obtaining mining licenses and permits is often subject to government regulations and administrative procedures (K. Söderholm et al., 2015). These licensing procedures' efficiency, transparency, and predictability can significantly impact a mining company's operations and overall business performance. Streamlined and well-defined licensing procedures can facilitate the timely commencement of mining operations, reducing bureaucratic delays and associated costs (Bauer et al., 2016; O'Callaghan & Vivoda, 2017). Conversely, the convoluted and protracted licensing procedures can potentially impede business performance by causing delays in production schedules and adding to the already burdensome administrative workload.

The impact of tax incentives provided through industrial mining policies is another factor that influences the performance of businesses. Governments frequently offer tax breaks, exemptions, or reduced tax rates to attract mining investments and foster economic growth (Kraal, 2019; Twesige & Gasheja, 2019). These incentives can significantly affect the profitability and financial performance of mining companies. Favorable tax policies can reduce operating costs and improve profitability, thus enhancing overall business performance (Song et al., 2017). Conversely, unfavorable tax policies, characterized by high tax rates or ambiguous tax regulations, can impose financial burdens on mining companies and harm their overall performance.

Furthermore, industrial mining policies often strongly emphasize the importance of community engagement and social responsibility. Mining activities can have profound social implications for local communities, including displacement, livelihood changes, and disruptions to cultural dynamics (Adam et al., 2015; Owen & Kemp, 2015). Industrial mining policies may require companies to engage in community development initiatives, provide employment opportunities, or contribute to local infrastructure projects. Strong community engagement and social responsibility practices can foster positive relationships with local stakeholders, minimize social conflicts, and enhance a company's reputation (Kirat, 2015; Yakovleva, 2017). These factors can indirectly contribute to improved business performance by securing social acceptance and maintaining a social license.

The mining industry relies heavily on innovation, which plays a crucial and transformative role. It brings forth many advantages, encompassing improved operational efficiency, cost reduction, sustainable environmental practices, and the progression of cutting-edge mining technologies (Galati & Bigliardi, 2019; Ng et al., 2022). Industrial mining policies can significantly influence a company's capacity to innovate, shaping the regulatory landscape and providing incentives or opportunities for research and development (R&D) collaborations (C. Chauhan et al., 2022; H. Zhang et al., 2022).

Regulatory compliance requirements are key factors affecting innovation in the mining sector. Industrial mining policies often establish standards and guidelines related to safety, environmental protection, and sustainable mining practices (Carvalho, 2017; R. Jain, 2015). These regulations can create challenges for mining companies

seeking to innovate, as they must ensure that their innovations comply with the prescribed rules. However, well-designed industrial mining policies can stimulate innovation by setting clear goals and incentivizing companies to develop new technologies or processes that meet or exceed regulatory requirements (Altenburg & Rodrik, 2017; Bonsu, 2020). By encouraging compliance through innovation, mining companies can enhance their competitive advantage and business performance.

Access to research and development incentives is greatly influenced by industrial mining policies, encompassing various aspects. Governments actively support mining companies by offering a range of financial aid, including grants and tax incentives (Otto, 2017). The industry, driven by a profound commitment, has wholeheartedly embraced diverse strategies to cultivate substantial investments in research and development (R&D). The ultimate objective behind this endeavor is to ignite innovation and propel progress, thereby charting new frontiers of advancement. The primary objective is stimulating ingenuity and encouraging advancements in this ever-evolving field (Pedersen et al., 2019).

These incentives, which play a pivotal role, alleviate the substantial financial burden often associated with extensive research and experimentation. By cultivating a supportive environment that nurtures innovation, industrial mining policies can incentivize companies to allocate resources toward exploring novel mining techniques, enhancing efficiency, mitigating environmental impacts, and developing sustainable practices (Jiskani et al., 2022; Lèbre & Corder, 2015; Z. Yu et al., 2022). Furthermore, policies promoting collaboration between mining companies, academic institutions,

and other industries can facilitate the exchange of knowledge and the transfer of innovative technologies, thereby propelling progress within the sector.

Exploring the intricate relationship between industrial mining policy and innovation plays a pivotal role in comprehending how policy interventions can cultivate a culture of innovation within the mining sector. Governments can cultivate a conducive atmosphere for mining companies by harmonizing policy goals with encouraging innovation (Anania & Bee, 2018; Dahliah, 2022). This alignment empowers the adoption and progression of pioneering technologies and practices, fostering a dynamic landscape. This approach holds immense implications, encompassing a plethora of advantages for the mining industry. These advantages include heightened operational efficiency, cost reduction, enhanced environmental sustainability, and cultivating resilience and competitiveness.

Innovation possesses the potential to generate significant positive impacts on the overall performance of mining companies. By nurturing innovation, mining companies can elevate their productivity, amplify their competitive edge in the global market, and introduce groundbreaking products or services (Fasnacht, 2018; Parniangtong, 2017). Consequently, it becomes imperative to thoroughly examine the influence of diverse innovation practices on the business performance of mining companies in Indonesia (Anshari & Almunawar, 2022; Sánchez-Flores et al., 2020).

When exploring the vast realm of research and development investments, an essential aspect that requires careful contemplation emerges. It becomes evident that mining companies that dedicate their resources to R&D endeavors possess a higher

propensity to cultivate and apply groundbreaking solutions (Hossain & Islam, 2018; Levenson, 2018). By investing in such pursuits, an array of advantages can be unleashed. These encompass streamlining operational processes to their utmost efficiency, delving into remarkably effective extraction methods, and formulating state-of-the-art technologies customized to meet the distinctive requirements of the mining sector. Consequently, mining companies prioritizing investments in research and development position themselves to achieve elevated productivity levels, cost-effectiveness, and overall business performance (Levenson, 2018; Sahoo, 2019).

Another critical innovation practice to explore is technology adoption. The mining sector undergoes continuous transformation, and the integration of groundbreaking technologies profoundly impacts a company's performance. Mining operations can be substantially transformed by integrating cutting-edge advancements such as automation, robotics, artificial intelligence, and data analytics (Shafiq, 2023; V. K. Sharma & Kumar, 2023). It leads to streamlined processes, optimized resource utilization, and notably improved safety measures, revolutionizing the industry.

This constant evolution and utilization of cutting-edge advancements create a dynamic environment where companies strive to stay at the forefront of technological progress (Georgios et al., 2019; Perifanis & Kitsios, 2023). This convergence of technologies paves the way for unprecedented possibilities in the mining sector. Mining companies that embrace technology adoption can experience improved operational efficiency, reduced downtime, and increased output, ultimately leading to enhanced business performance (Campbell et al., 2017; Javaid, Haleem, Singh, Suman et al., 2022).

Effective knowledge transfer plays a pivotal role in exploring the connection between innovation and the overall performance of businesses. By fostering collaboration and promoting knowledge sharing among mining companies, research institutions, and other pertinent stakeholders, the exchange of expertise, best practices, and groundbreaking ideas can be facilitated, fueling the potential for innovation and success (Presenza et al., 2019; Rhem, 2016). Active participation in knowledge transfer initiatives can bring significant advantages to mining companies. By tapping into the collective knowledge and experiences of the industry, these companies can enhance their ability to implement innovative solutions with greater effectiveness. As a consequence, they have the potential to achieve enhanced operational processes, significant cost savings, and a notable surge in overall business performance.

Industrial mining policy encompasses a set of regulations, laws, and guidelines that govern mining activities within a country. The formulated policies aim to establish mining practices that are both sustainable and responsible, emphasizing the protection of the environment and the preservation of diverse stakeholders' interests. The provisions within industrial mining policies can directly influence a mining company's operations, such as environmental standards, licensing procedures, and tax incentives (Lesser et al., 2017; Litvinenko et al., 2020). However, the extent to which these policies affect firm business performance can be further understood by exploring their indirect impact through innovation.

Innovation is a critical mechanism for industrial mining policy to influence firm performance. By embracing innovative approaches, mining companies have the potential to foster cutting-edge technologies, optimize operational efficiency, and

introduce pioneering products or services. Such endeavors augment their competitive advantage and contribute to their overall performance. Supportive industrial mining policies can create an environment conducive to innovation by incentivizing R&D investments, promoting technology adoption, and facilitating collaboration among industry players (Han et al., 2022; Paunov & Planes-Satorra, 2019; Rohatgi & Rao, 2017). These policy interventions can influence the level of innovation within mining companies, subsequently impacting their business performance.

Based on the above description, the problem statement for this research can be formulated as follows:

1) Despite the government's intention to improve national mining governance and the economy through the Indonesian industrial mining policy, the changing regulatory landscape, exemplified by Law No. 4 of 2009 and its subsequent amendments, posed a significant challenge for mining companies to balance their firm business performance.
2) Indonesian mining companies face a significant problem in implementing targeted innovations in response to government regulations, as exemplified by the smelter construction project and the electric vehicle battery project, due to the requirements set by the industrial mining policy and relevant laws.
3) The implementation of business innovations by mining companies in Indonesia presents a challenge in their pursuit of enhancing firm business performance and revenue, thus necessitating a strategic balance to strengthen their position in global competition.

4) The requirement for mining companies in Indonesia to construct smelters and engage in continuous innovation to comply with industrial mining policies poses challenges and substantial investment costs but offers the potential for increased firm business performance and revenue.

1.4 Research Question

The mining industry holds immense sway over the economic progress of numerous nations. In Indonesia, industrial mining policies have been set in motion to oversee and manage this sector. These policies aim to establish an equilibrium between the utilization of natural resources and the enduring advancement of mining enterprises (Bradu et al., 2022; Helwege, 2015). However, the relationship between industrial mining policy and firm business performance and the mediating role of innovation remains underexplored.

The intricacies of this research delve into various dimensions of the intricate web that binds policy, innovation, and firm performance. By examining the direct impact of policy on firm performance, the influence of policy on fostering innovation, the correlation between innovation and firm performance, and the role of innovation as an intermediary in the policy-performance nexus, this study aims to unravel the complex dynamics at play. The following research questions are posed to shed light on these complex dynamics:

(1) Does the industrial mining policy exert a supportive influence on or enhance the business performance of mining companies?

(2) Does the industrial mining policy catalyze promoting innovation within mining companies?

(3) Does innovation play a pivotal role in bolstering the business performance of mining companies?

(4) To what extent does innovation mediate the impact of the industrial mining policy on the business performance of mining companies?

The ultimate goal of this study is to make a noteworthy contribution to the existing body of literature that explores the intricate relationship between industrial mining policy, innovation, and firm performance. The insights gleaned from this research will prove invaluable to policymakers and mining companies in Indonesia, empowering them to devise and implement effective policies and strategies that enhance environmental sustainability and drive business profitability (Solovida & Latan, 2017).

1.5 Research Objective

The overarching goal of this study is to delve into the intricate interplay between industrial mining policy, the performance of business enterprises, and the realm of innovation. Moreover, it seeks to probe the intermediary function of innovation in the intricate nexus between industrial mining policy and the business performance of

mining companies operating within the Indonesian landscape. To be more precise, the research endeavors to achieve the following specific objectives:

(1) To ascertain the direct impact of industrial mining policy on the overall business performance of firms.
(2) To determine the direct effect of industrial mining policy on innovation.
(3) To determine the direct effect of innovation on the firm business performance.
(4) To investigate innovation's indirect (mediating) effect on the relationship between industrial mining policy and firm business performance.

By addressing these research objectives, this study aims to provide valuable insights into the interplay between industrial mining policy, innovation, and firm business performance in the context of mining companies in Indonesia. The findings can inform policymakers, mining industry stakeholders, and researchers about the importance of effective policy frameworks and innovation strategies for enhancing business performance and sustainable development within the mining sector.

1.6 Study Limitations

Every research has limitations arising from methodological or research design constraints, potentially impacting the entire study. However, many researchers choose not to address these limitations due to concerns about their article's credibility. Nevertheless, it is crucial to acknowledge and discuss the limitations of a study to inform the audience, including other researchers, journal editors, and peer reviewers

(Benchimol et al., 2015). By doing so, the researcher demonstrates an awareness of the potential influence of these limitations on the study's conclusions and findings, indicating that all relevant flaws have been investigated (Hancock et al., 2021; Huber & Helm, 2020).

This research study encompasses various noteworthy limitations that warrant attention. Primarily, it is crucial to acknowledge that the scope of this investigation is confined to delving into the intricate interplay between the industrial mining policy and the business performance of mining companies in Indonesia. Notably, the emphasis is placed on elucidating the mediating role of innovation within this context. Henceforth, it becomes crucial to acknowledge that the findings and conclusions obtained from this study might not be universally applicable to other industries or countries due to the significant disparities in contextual factors and conditions that could prevail.

Furthermore, the research sample consists of individuals working in the mining industry, including policymakers, mining entrepreneurs, academics, consultants, and others. While this selection ensures that the respondents know about the national mining industry policy, it also introduces potential bias and subjectivity in their answers (Cirera & Muzi, 2020; Walzenbach, 2019). The perspectives and opinions of respondents may vary depending on the specific agency or organization they represent, which could influence the research outcomes (Bryson et al., 2015; Chapman et al., 2015).

Additionally, the study was conducted within a specific time frame, starting from implementing the industrial mining policy on minerals and coal, particularly considering the updates introduced by law number 3 of 2020. This time constraint may

limit the generalizability of the findings to different periods or policy contexts (Brannen, 2017). Long-term effects or changes in the policy implementation may not be fully captured within the research timeframe (Luderer et al., 2016; Smart & Pacula, 2019; X. Wang et al., 2020).

Lastly, the availability of previous research directly related to the intersection of mining industry policies, innovation, and company business performance is limited. Due to this circumstance, the researcher was compelled to depend on a limited selection of scholarly sources that directly delve into the subject matter. This scarcity of existing studies may impact the depth of analysis and breadth of perspectives within the literature review section (Palmatier et al., 2018; Sovacool et al., 2018). By acknowledging these limitations, the researcher ensures transparency and encourages future studies to address these gaps and refine the understanding of the relationship between industrial mining policy, innovation, and firm business performance among mining companies in Indonesia.

1.7 Importance of Research

The study's significance describes the significance of the research. It enables demonstrating the study's impact on the research field, the new knowledge it contributes, and the individuals who will benefit from it. The significance of the study describes how this research will contribute to the existing body of knowledge in the field. It describes the significance of the research to the community, the people, and

various institutions and why it is worthwhile to conduct the research (Kozleski, 2017; McNabb, 2017).

This study delves into a timely and pertinent subject matter: assessing the influence of Indonesia's new mining law and the industrial mining policy on the operational performance of mining companies. Given the novelty of this mining legislation, there exists a scarcity of literature scrutinizing its effects on the mining industry (D. Ali & Rehman, 2020; Willaert, 2022). Consequently, this research is vital in bridging this knowledge gap by investigating the correlation between industrial mining policy and firm performance. In doing so, it provides invaluable insights that hold significance for academic scholars and industry practitioners.

This study goes beyond surface-level exploration by examining the mediating role of innovation. A comprehensive understanding is offered by unraveling the mechanisms through which mining companies can enhance their business performance in light of the industrial mining policy (Eggers et al., 2021; Stubrin, 2017). Innovation is pivotal in adapting to policy changes and securing sustainable competitive advantage. Thus, this research endeavors to shed light on how innovation mediates the relationship between policy and business performance, contributing to a deeper comprehension of the factors that influence the success of mining companies in Indonesia.

Furthermore, the implications of this study extend beyond theoretical realms and hold practical value for numerous stakeholders. The Indonesian government, in particular, is a crucial stakeholder capable of leveraging the research outcomes to evaluate and shape future mining industry policies (M. H. Li et al., 2018; Permatasari

& Gunawan, 2023). By employing the insights derived from this study, policymakers can make informed decisions that foster the growth and sustainability of the mining sector while considering the intricate interplay between firm performance, innovation, and policy impact (Ullah et al., 2021).

Furthermore, mining companies operating in Indonesia can benefit from the research by better understanding how industrial mining policy affects their business performance and the role of innovation in navigating policy challenges (Bravo-Ortega & Muñoz, 2021; Hendriarto, 2021). By leveraging this knowledge, mining firms can develop strategic initiatives and innovative practices that align with the regulatory framework, thereby improving their competitiveness and long-term viability in the global market (Santos et al., 2015; Zapata-Cantu & González, 2021).

Moreover, it is crucial to acknowledge that the implications of this investigation go beyond the confines of academia. The broader society stands to reap significant benefits from these findings. By shedding light on the intricate correlation between industrial mining policy and the operational effectiveness of mining companies, this study not only enhances public awareness but also deepens our understanding of Indonesia's mining sector. This enhanced understanding empowers individuals and communities to engage in informed dialogues and actively contribute to formulating policies addressing mining activities' multifaceted environmental, social, and economic dimensions (M. H. Li et al., 2018). This holistic approach fosters a more inclusive and sustainable future for all stakeholders.

This research holds immense significance as it effectively bridges a void within the current body of literature. Notably, it delves into the intricate dynamics of innovation as a mediating factor, offering profound insights for various stakeholders, including the Indonesian government, mining companies, and the general public. By meticulously examining the interplay between industrial mining policy and firm business performance, this study makes a remarkable contribution to advancing knowledge in the field. Moreover, its findings possess the potential to catalyze transformative changes within the mining industry of Indonesia, ushering in a wave of positive transformations.

1.8 Summary

The introduction chapter of this dissertation delves into the research topic, delving deep into the intricate relationship between industrial mining policy, innovation, and firm business performance in the vibrant landscape of Indonesia. The chapter commences by shedding light on the dynamic implementation of the mineral and coal law policy, offering a comprehensive backdrop of the ever-evolving Indonesian mining industry (Paryati, 2022). A diverse range of opinions surrounds this policy, with contrasting perspectives emerging from different corners. However, it is crucial to underscore that the policy's fundamental objective revolves around the prosperity and well-being of the Indonesian populace.

One remarkable consequence stemming from this policy is the impetus it provides to mining companies, compelling them to embrace innovative business

practices that ensure the sustainability of their endeavors (Besada & Martin, 2015; Hilson, 2016). This obligatory demand for innovation is expected to ultimately elevate the overall business performance of mining companies, yielding significant advantages for the entire Indonesian society. However, it is imperative to acknowledge that fulfilling the constitutional mandate outlined in Article 33 Paragraph (3) of the revered 1945 Constitution through enacting Law Number 4 of 2009, subsequently updated by Law Number 3 of 2020, entails navigating a labyrinth of intricacies and formidable challenges.

Many mining companies perceive this regulation as potentially threatening their viability, posing various operational obstacles. Therefore, this study aims to comprehensively understand the relationship between industrial mining policy, innovation, and firm business performance. To ensure the research findings accurately reflect the parties involved in the national mining industry, the sample data for this study were collected from a population of respondents who know about mineral and coal laws. This approach aims to minimize bias and enhance the reliability of the research outcomes (Wu et al., 2022; J. Zhang et al., 2016).

This study aims to enrich our understanding of the intricate interplay between industrial mining policy, innovation, and firm business performance. By delving into the depths of the Indonesian mining sector, it seeks to illuminate the dynamic forces at play. The theoretical framework, methodology, data analysis, and findings will be explored to unveil the intricate nature of the subject matter and shed light on its profound implications for mining companies and policymakers in Indonesia. This

comprehensive endeavor seeks to untangle the complexities intertwined within this domain, presenting a rich tapestry of insights for all stakeholders involved.