THE EFFECTS OF FINANCIAL AND TECHNOLOGICAL LITERACIES ON SUSTAINABILITY PERFORMANCE OF IKM IN INDONESIA: MEDIATING ROLE OF COMPETITIVE ADVANTAGE

NOVITA RATNA SATITI

UNIVERSITI SAINS MALAYSIA

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NOVITA RATNA SATITI

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α	Cronbach Alpha Coefficient
R^2	The models simultaneous correlation between independent variable and dependent variable
V	The processing layer in ANN
x_i	The value of the number of weighted inputs ANN
n	The number of inputs in ANN neurons/ independent variable in the model
λ	The standardised factor loading for item i
ε	The respective error variance for item i
sab	The magnitude of the standard error of indirect effect
a	Path of independent variables with intervening variables
b	The path of intervening variables with the dependent variable
sa	Standard error coefficient a
sb	Standard error coefficient b
w_i	The weighted value/ regression/ path coefficient in the linear model
θ	The threshold value
x	The predicted value of the output neuron
$Y^{sigmoid}$	The predicted value of the output neuron
X	The weighted number of inputs
m	The number of hidden layers
ln	The log natural
y_i	The actual value of the dependent variable
$\widehat{y_i}$	The predicted value of the dependent variable

LIST OF ABBREVIATIONS

AEC	ASEAN Economic Community
ASEAN	Association of Southeast Asian Nations
ADB	Asian Development Bank
ANN	Artificial Neural Networks
AVE	Average Variance Extracted
CA	Competitive Advantage
CB-SEM	Covariance-Based Structural Equation Modeling
CMB	Common Method Bias
CMV	Common method Variance
COVID-19	CoronaVirus 2019
CO2	Carbon Dioxide
CR	Composite Reliability
CSR	Corporate Social Responsibility
CV	Control Variable
DV	Dependent Variable
EFA	Exploratory Factor Analysis
EU	European Union
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GSI	Global Sustainability Index
G-20	Group of 20
HTMT	The Heterotrait-Monotrait Ratio
ICT	Information and Communication Technology
SME	Small Medium Enterprise
IBM-SPSS	International Business Machines - Statistical Package for the Social Sciences
IKM	Industri Kecil Menengah/ Small-medium scale industries
IV	Independent Variable
KUR	Kredit Usaha Rakyat/ Public business credit
MCSME	Ministry of Cooperatives and SMEs
MDGs	Millennium Development Goals (MDGs)
MFI	Microfinance Institution

MIT	Middle Income Trap
MOI	Ministry of Industries
MP3EI	Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia/ Masterplan for Acceleration and Expansion of Indonesia's Economic Development
OECD	Organisation for Economic Cooperation and Development
PCA	Principal Component Analysis
PLS-SEM	Partial Least Square Structural Equation Modelling
RBV	Resource Based View
RMSE	Root Mean Square Error
RPJMN	Medium-Term National Development Plan
SDGs	Sustainable Development Goals
TBL	Triple Bottom Line
UN	United Nations
UN-APCICT	United Nation - Asia and Pacific Training Center
UU ITE	Undang-Undang Informasi dan Transaksi Elektronik/ Law of electronic information and transactions
VRIN	Valuable, Rare, Inimitable, and Non-substitutable

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KESAN LITERASI KEWANGAN DAN TEKNOLOGI TERHADAP PRESTASI KELESTARIAN SME DI INDONESIA: PERANAN PENGANTARA KELEBIHAN DAYA SAING

ABSTRAK

Perniagaan pada masa kini menghadapi cabaran dan peluang yang sentiasa berubah-ubah, terutamanya dalam bidang kewangan dan teknologi. Pengetahuan terkini tentang perubahan-perubahan ini penting untuk mengekalkan daya saing. Dalam sektor Perusahaan Kecil dan Sederhana (SME), satu cabaran yang sering dihadapi ialah ramai pemilik/pengurus percaya bahawa perancangan strategik hanya untuk syarikat besar. Hal ini menyebabkan SME kekurangan hala tuju strategik. Literasi kewangan (FL) dan literasi teknologi (TL) adalah penting bagi SME kerana kemahiran ini secara langsung memberi kesan terhadap keupayaan mereka untuk memperoleh Kelebihan Bersaing (CA) dan mencapai Prestasi Mampan (SP), selaras dengan Matlamat Pembangunan Mampan (SDGs). Kajian ini bertujuan untuk menyelidik hubungan antara FL dan TL, dan cara kedua-dua kemahiran ini menyumbang kepada CA dan SP. Dengan menggunakan teori *Resource-Based View* (RBV) dan teori *Triple Bottom Line* (TBL), dengan CA sebagai pengantara, kajian ini mencadangkan satu kerangka yang komprehensif. Data dikumpulkan melalui tinjauan kuantitatif dengan teknik persampelan rawak berstrata yang melibatkan 407 orang responden dari SME, dan data dianalisis dengan menggunakan Pemodelan Persamaan Struktur – Kuasa Dua Separa terkecil (PLS-SEM) serta Rangkaian Saraf Tiruan (ANN). Dapatan kajian menunjukkan bahawa FL, khususnya aspek dalaman dan luaran syarikat, serta dimensi khusus TL (dasar ICT dan sumber manusia ICT), merupakan faktor-faktor penting yang mempengaruhi CA. Selain itu, didapati CA memberi impak positif terhadap SP kerana

CA berperanan sebagai pengantara antara FL dan SP. Walau bagaimanapun, CA hanya menjadi pengantara dalam hubungan antara dasar ICT dan SP dalam TL, tidak merangkumi dimensi TL yang lain. Kesimpulan kajian ini disahkan melalui penggunaan ANN. Kesimpulannya, kajian ini menekankan bahawa FL yang komprehensif penting untuk memperkasakan pemilik/pengurus untuk menghadapi cabaran perniagaan dengan berkesan, meningkatkan CA, dan menggalakkan prestasi yang mampan.

THE EFFECTS OF FINANCIAL AND TECHNOLOGICAL LITERACIES ON SUSTAINABILITY PERFORMANCE OF IKM IN INDONESIA: MEDIATING ROLE OF COMPETITIVE ADVANTAGE

ABSTRACT

Businesses today face evolving challenges and opportunities, particularly in the fields of finance and technology. It is crucial to stay informed about these changes to maintain competitiveness. In the Small and Medium Enterprises (SME) sector, a particular obstacle is evident: many owners/managers believe that strategic planning is only for large companies, leading to a lack of strategic direction. Financial Literacy (FL) and Technology Literacy (TL) are essential for SMEs, as these skills directly impact their ability to gain Competitive Advantage (CA) and achieve Sustainable Performance (SP), in alignment with the Sustainable Development Goals (SDGs). This study aims to investigate the relationship between FL and TL, and how they contribute to CA and SP. Utilizing the Resource-Based View (RBV) theory and the Triple Bottom Line (TBL) theory, with CA as a mediator, this study proposes a comprehensive framework. Data was collected through a quantitative survey using a stratified random sampling technique involving 407 SME respondents and was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) and Artificial Neural Networks (ANN). Findings highlight FL, particularly internal and external aspects of companies, along with specific dimensions of TL (ICT policies and human resources in ICT), as critical factors influencing CA. Additionally, it was found that CA positively impacts SP, serving as a mediator between FL and SP. However, CA only mediates the relationship between ICT policies and SP within TL, not for other TL dimensions. The study's conclusions were validated using ANN. In conclusion, this study underscores

the importance of comprehensive FL in empowering owners/managers to effectively tackle business challenges, enhance CA, and facilitate sustainable performance.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Chapter 1 covers the initial introduction of this research. Firstly, the background of this research is presented in Section 1.2 along with a brief highlight of the manufacturing sector, specifically about the small-medium industry which is called Industri Kecil Menengah (IKM) in Indonesia. Section 1.4 discusses the problem statement of the research. Based on the problem statement, research objectives and research questions are derived in Sections 1.5 and 1.6. The significance of the research is divided into theoretical and practical significance in Sections 1.7 and 1.8. In section 1.9, the definition of the key terms is presented.

1.2 Background of Study

Section 1.2 describes the background of this research focussing on sustainability which is an important issue. As one of the sustainability indicators, economic performance is the focus of researchers, practitioners, and policymakers. Indonesian IKM's economic performance in the SME Group of Twenty (G-20) and ASEAN Economic Community (AEC) is still far from the sophisticated world of manufacturers (Zein et al., 2020).

Furthermore, the decreased rank in the Global Competitiveness Index (GCI) and fluctuating rank in Global Sustainability Index (GSI) occur despite the government policies and programs in Sustainable Development Goals (SDGs). Many Indonesian manufacturers are hampered by Human Resource (HR) and strategic constraints including a lack of know-how and know-what (PWC & Oxford Business Group, 2021).

Amidst the challenges of manufacturing IKM in Indonesia, these should be tackled comprehensively to become a high-income nation by 2034.

1.2.1 Business Analytics and Financial Technology

Business analytics is a set of disciplines and technologies that use data analysis, statistical models, and other quantitative methods to solve business problems. It entails an iterative, methodical exploration of an organisation's data to drive decision-making, focusing on statistical analysis (Piot-Lepetit & Nzongang, 2021). Specifically, business analytics is defined as a systematic process involving collecting, analysing, using, and interpreting data to gain actionable insights for effectively creating business value and achieving long-term performance (Angappa et al., 2017; Chatterjee et al., 2021).

Data-driven businesses treat their data as a business asset and actively seek ways to leverage it to gain a Competitive Advantage (CA). Data quality, skilled managers/analysts who understand the technologies and the business, and a commitment to using data to gain insights that inform business decisions are all required for success with business analytics (Moraes et al., 2022).

Business analytics allows corporations to improve their procedures and become more productive. To remain competitive, businesses must be one step ahead of their competitors and access the most up-to-date tools to help them make better decisions while increasing efficiency and profits. Businesses can better understand primary and secondary data generated by their activities by using business analytics tools. Thus, the business managers should have the basic skills to use the tools. The World Economic Forum (2022) declares the ten essential skills for business in the first place is analytical thinking and innovation which is closely related to managerial aspects and the application of technology.

Business analytics plays an essential role as a change accelerator, such as accelerating the growth of business economies of scale, from micro to small scale and then move to large scale (Chatterjee et al., 2021). The business process is linked to the use of modern technology. The new technological tools connect multiple business processes to obtain valuable, rare, inimitable, and non substitutable (VRIN) resources and improve business performance (Ferraris et al., 2019). The VRIN resource is explained in the Resource-Based View (RBV) theory (Barney, 1991).

Business analytics and financial technology offer powerful tools for optimizing decision-making, enhancing efficiency, and fostering innovation in businesses, which are critical for driving economic growth and competitiveness. As Indonesia strives to improve its economic performance within the Group of Twenty (G20) and ASEAN Economic Community (AEC), leveraging these technologies can help the country harness its resources more effectively, attract investment, and strengthen its position in the global marketplace. As Indonesia aims to transition into a high-income nation, adopting advanced analytics and financial technology can be pivotal in modernizing industries, boosting productivity, facilitating sustainable economic development, and supporting the nation's overarching goals (Ma'ruf & Aryani, 2019; Syahwier, 2018).

Fintech, a combination of the terms "financial" and "technology," refers to businesses that use technology to enhance or automate financial services and processes (Seldal & Nyhus, 2022). Fintech is not merely a confluence of financial and technology literacies; rather, it represents an innovative domain that leverages these literacies to enhance and streamline financial services (Świecka, 2019). According to recent research (Seldal & Nyhus, 2022), the combination of digital payment methods and low financial literacy may have a negative effect on financial management, in businesses. Previously, Kalinic et al. (2019) and Boakye et al. (2023) discovered that lower

financial literacy was associated with lower business performance due to misapplication of technology and finance.

Financial Literacy is defined as the knowledge and cognitive capabilities required to manage finances and make informed financial decisions, a concept highlighted by Adomako et al. (2016). This form of literacy is crucial for SME owners and managers to competently navigate financial frameworks, budgeting, and investment opportunities. Technological Literacy, described by Mazurchenko et al. (2020), involves the ability to use technology responsibly and effectively to access, manage, and communicate information.

Fintech represents a dynamic intersection of the financial services sector and technological innovation, tailored to enhance and automate financial processes and services. This is particularly relevant in the business and SMEs sector, where fintech can streamline operations, expand access to financial markets, and facilitate more efficient transaction processing. Central to effectively leveraging fintech within these sectors are Financial Literacy (FL) and Technological Literacy (TL).

In the context of SMEs, the interplay between FL and TL is essential for the adoption and optimal use of fintech solutions. As these businesses incorporate advanced fintech tools, a solid grounding in both financial and technological literacy ensures that they not only adopt these technologies but also enhance their competitive advantage and operational efficiency. Thus, improving FL and TL in the SME sector is key to unlocking the full potential of fintech, enabling businesses to thrive in an increasingly digital marketplace.

Technology introduces vulnerabilities, including ambiguity in legality and data security concerns, affecting trust among corporate partners. Technology-related risks such as operational, cyber, system, and Moral Hazards also exacerbate these trust issues.

There is a growing need for financial transparency, accountability, and literacy to mitigate these risks and reduce information asymmetry. Recognizing the inseparable connection between financial and technology literacy is essential for leveraging the benefits and achieving competitive advantages in business operations.

Business analytics drives business performance, encompassing financial and operational domains. Financial and technological tools aid companies, business owners, and consumers manage financial operations efficiently. Utilizing specialized software and algorithms on various platforms, including computers and smartphones, facilitates better financial management. Data analytics, mainly Artificial Neural Networks (ANN), play a pivotal role in understanding customer behavior and preferences. As firms better grasp their financial status through technological solutions, they can effectively tailor offerings to meet customer needs.

Employing analysis tools like ANN enables firms to gain insights into their financial strengths and weaknesses. These tools provide more reliable information, empowering decision-makers to make informed choices. With its feedforward and feedback propagation capabilities, ANN stands out among neural network models for solving complex business problems. Its ability to validate and predict variables in business development underscores its significance in driving financial and technological advancements. Thus, integrating ANN and other analytics tools is crucial for navigating the evolving landscape of financial stewardship and ensuring sustained profitability and growth.

Furthermore, integrating Artificial Neural Networks (ANN) into financial and technological practices revolutionizes decision-making processes. ANN's ability to analyze vast amounts of data and identify complex patterns enables organizations to make more accurate predictive assessments. By leveraging ANN, firms can optimize

investment strategies, detect fraudulent activities, and forecast market trends with unprecedented precision. Moreover, ANN's adaptability allows it to continuously learn and improve its performance, making it a powerful tool for driving innovation and competitiveness in the financial sector (Chen et al., 2020).

As businesses increasingly rely on data-driven insights to gain a competitive edge, the role of ANN becomes even more pronounced. Its capacity to uncover hidden correlations and anticipate future outcomes empowers organizations to stay ahead in dynamic markets. Through ongoing research and development, ANN continues to evolve, offering new possibilities for enhancing financial operations and technological advancements. By embracing ANN as an integral part of their analytical toolkit, companies can unlock untapped potential and drive transformative change in the ever-evolving landscape of finance and technology.

1.2.2 Recent Trends of Sustainability

Literature on sustainability appeared in the 1990s. Since then, researchers and practitioners have become interested in the subject until today (Srikalimah et al., 2020). Elkington (1998) introduces integrating sustainability into the corporate environment. This approach is called the Triple Bottom Line (TBL) management which is for achieving environmental, social, and economic objectives. TBL states that at the convergence of environmental, economic, and social performance, corporations find activities that have a considerable impact on the community and environment and would lead to long-run economic and competitive advantage (Hourneaux et al., 2018).

Sustainable manufacturing is related to sustainability development (Muhardi et al., 2020). Nowadays, businesses are encouraged to align their activities with sustainability goals. Sustainability in manufacturing is currently a critical issue for governments and industries worldwide (Nguyen et al., 2021). Achieving sustainability

in manufacturing activities is recognized as an urgent need due to depleting non-renewable resources, strict environmental and work safety regulations, and increasing consumer preferences for environmentally friendly products (Ananta & Berkhof, 2020). Early solutions to environmental, social, and economic challenges improved ongoing manufacturing process improvements (Nor-Aishah et al., 2020).

Manufacturing sectors are essential for global sustainability since it contributes significantly to labour employment, resource consumption, and energy consumption (Madaleno et al., 2022). From a pragmatic point of view, the results of management attempts to tackle challenges posed by the need for corporations is to move towards sustainability (Koho et al., 2015). However, the path to a sustainable corporation remains unclear. Nevertheless, improved environmental and social practices can help companies to gain a competitive advantage and subsequently improve their performance (Abdul-Rashid et al., 2017; Aboelmaged, 2018).

Given the broad and ambitious goal of sustainable development, corporate sustainability is a challenging concept that requires operationalization. In this context, information about sustainability impacts and performance can help managers incorporate deliberative, sustainable thinking into their decision-making comprising planning, implementation, and control activities (Argento et al., 2022). Thus, managers must involve themselves in developing market frameworks to internalise the external effects of business. Through lobbying and other means, these could increase public awareness of the need for sustainability through lobbying and other means.

It has never been more important to pursue sustainability in the manufacturing industry. From an environmental perspective, sustainability manufacturing is a worthwhile and advantageous business goal (Eweje, 2020). In the future, customers will support businesses with high-quality components and environmentally friendly goods.

According to the United Nations (UN), several sustainability trends are emerging across manufacturing and process industries. These would involve a shift to recyclable materials, increased interest in bioplastics, contributing to the circular economy, tapping into renewable energy resources, and embracing technology and digital manufacturing.

The UN member on Climate Change Conference (COP21) in Paris, France in December 2015 states the SDGs represent a significant policy achievement for assessing environmental, social, and economic development and guiding future scenarios. Globally, governments are committed to protecting ecosystems, promoting equality, and focusing on sustainability development while simultaneously recognizing the interconnectedness of these objectives for achieving human wellbeing. The concept of a coherent policy for sustainability development in the UN 2030 Agenda which emphasises the importance of coherent national political solutions for sustainability development. The ability to create coherence between and within the SDGs is a huge challenge and an absolute necessity (Nordbeck & Steurer, 2016).

The SDGs are a series of seventeen goals as seen in Figure 1.1. Each goal has several targets and indicators. Targets specify the goals, and indicators represent the metrics to track whether targets are achieved. The SDGs, also known as global goals, built on the achievements of the Millennium Development Goals (MDGs) and aspire to go even further in eradicating poverty. The new goals are unique in that SDGs call on all countries, rich and poor, to take action to create prosperity while also conserving the environment. All countries acknowledge that eradicating poverty requires policies that promote economic growth while addressing various social needs such as education, health, social protection, job opportunities, climate change, and environmental protection (United Nations Statistics Division, 2020).

Source: United Nation

Figure 1.1 The Seventeen Pillars SDGs of United Nation

The SDGs encourage long-term economic growth, increased productivity, and technological innovation under SDG 8. Among the six indicators measuring progress toward SDG 8, three refer to employment: the total employment rate, unemployed and uneducated young people, and long-term unemployment rate. Another two refer to decent work: involuntary temporary employment and people killed in accidents at work. The last indicator is Gross Domestic Product (GDP) per capita refers to economic growth. GDP is a measure of progress toward sustained economic growth (Ma'ruf & Aryani, 2019). The UN defines a quantifiable target for SDG 8 as a minimum 7% annual growth for the least developed countries and poses the now long-standing question of the parameters measuring development.

As a developing country, Indonesia is committed to the 2030 UN SDG Agenda through the enactment of Presidential Regulation No. 59 the Year 2017 on the Implementation of the SDGs. Under the Regulations mandate, Indonesia mainstreamed

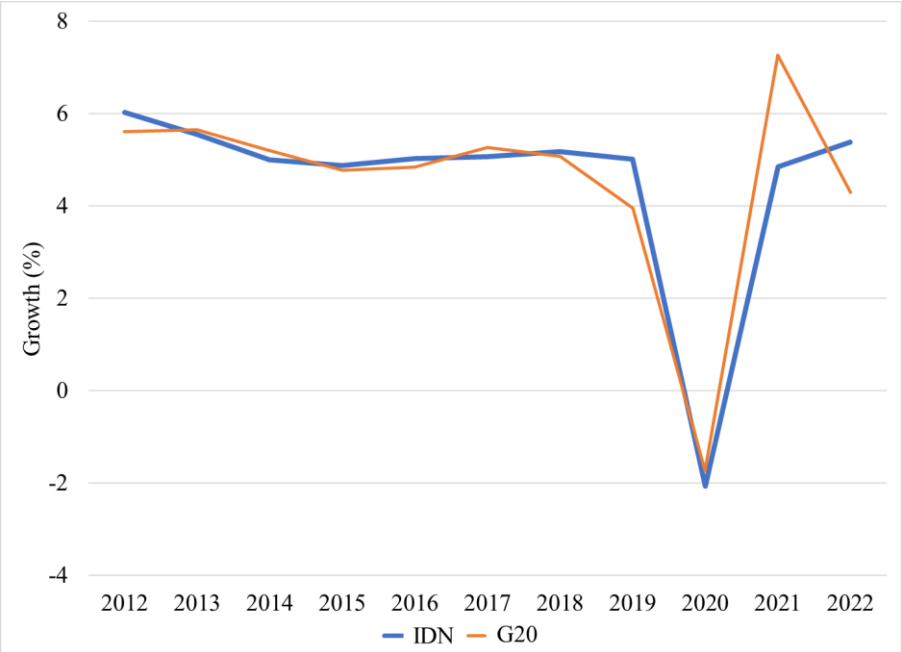
the targets and indicators of sustainable development to the 2017-2019 and 2020-2024 *Rencana Pembangunan Jangka Menengah Nasional*/ Medium-Term National Development Plan (RPJMN), localising sustainable development at a subnational level the development of the SDGs Roadmap Towards 2030. RPJMN details the President's vision, mission, and programs. It includes national development strategies, policies, Ministry and cross-Ministry programs, regional development, and a macroeconomic framework outlining the economy and fiscal policy directions within a regulatory and indicative funding framework (Ministry of National Development Planning, 2021). The inclusivity principle remains an anchor in implementing SDGs which involve ministries and institutions and encourage partnership with corporations. Thus, this research conducts an intense discussion about manufacturing industries in Indonesia.

1.2.3 Indonesia's Economic Performance in Group of Twenty (G-20) and ASEAN Economic Community (AEC)

Indonesia, a member of the G-20 since 2008, has grown to become one of the world's largest economies with significant development potential in the coming decades. G-20 is a group of finance ministers and Central Bank Governors from 19 of the world's largest economies including many developing nations and the European Union (EU).

The G-20 which was founded in 1999 encourages global economic growth, international trade, and financial market regulation. Compared to other G-20 Nations, Indonesia's GDP movement has similarities with the G-20 countries, hovering around 4% to 6% from 2012 to 2019 (Figure 1.2). Subsequently, the GDP shrank and exposed some of the country's weaknesses attributed to the Corona Virus Disease (COVID-19) pandemic after two decades of continuous-steady growth (Afriza, 2021).

To tackle the crisis, all members of the G-20 implemented unprecedented policy actions to limit the harm. However, Indonesia showed the same performance in 2020-2022 pre-pandemic. Meanwhile, other G-20 members showed a spike in GDP growth more than in previous years. This raises the question of why Indonesia's achievements could not resemble other countries pre-pandemic.



Source: OECD Economic Surveys: Indonesia (2022)

Figure 1.2 Indonesia Versus G-2 GDP Growth 2012-2022

From the Organisation for Economic Cooperation and Development (OECD) Report 2021, Indonesia's unfavourable multiplayer effect during the pandemic outbreak slowed Indonesia's economic recovery. At that time, Indonesia was on the verge of a recession with characteristics such as unexpected economic shocks that caused significant financial damage (Ministry of National Development Planning, 2021). Furthermore, unexpected technological adoption in all aspects of business, reducing the need for labour, managerial errors due to managers' lack of knowledge, and government policies that are not well-targeted are included in the business challenges of Indonesia (Hanggraeni & Sinamo, 2021).

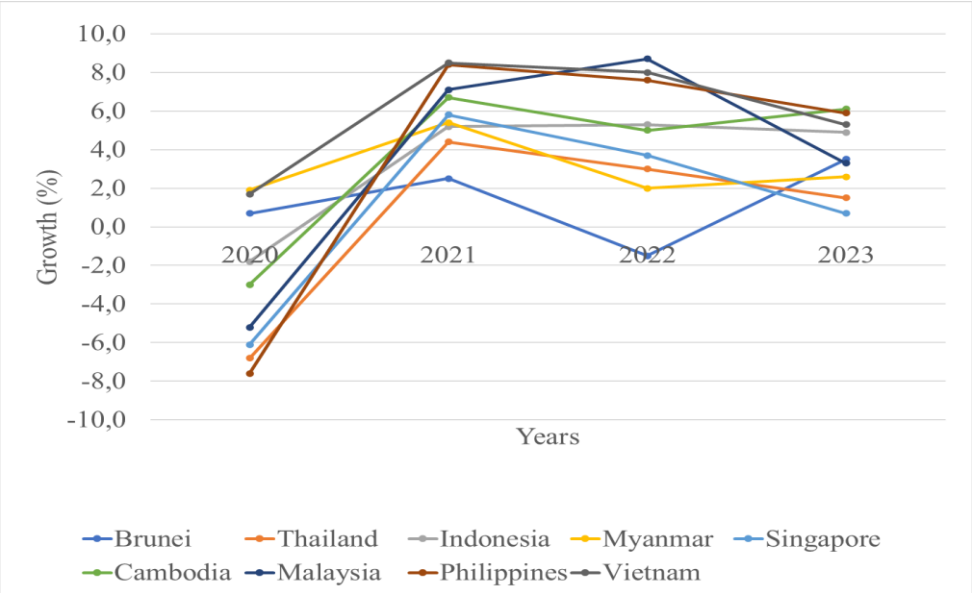
Long before the pandemic outbreak in 2007, ASEAN countries developed its Blueprint for the AEC. The Blueprint defined four "pillars" of the AEC to create a single market and production base, competitive economic area, equitable economic development, and an internationally integrated regional economy. The AEC's implementation was a work in progress for the last eight years. There were numerous trade and economic treaties proposed or ratified. However, the organisation faced delays in the ratification of many agreements and some states were slow to enact legislation domestically (ASEAN Statistical Yearbook 2021).

Cross-country development and efficiency gaps continue to undermine AEC objectives, and cross-cultural and political differences have proven irreconcilable with consensus building. Stemming from this condition, Indonesia's economy was experiencing persistent challenges over the years. If Indonesian IKM has outstanding competitive ability, IKM could expand internationally. A positive impact of the AEC accounts for 99% of all enterprises employing 89% of the private sector's workforce and contributing 57% at minimum to the country's GDP (ASEAN Statistical Yearbook 2021).

Figure 1.3 shows the economic performance of the ASEAN nations. From 2020 to 2023, the ASEAN region witnessed a diverse economic landscape across its member states. Brunei experienced a modest growth of 0.7% in 2020, followed by a robust expansion of 2.5% in 2021, although facing a slight contraction of -1.5% in 2022 before bouncing back with a notable growth of 3.5% in 2023. Thailand struggled with a significant decline of -6.8% in 2020 but managed to recover steadily with growth rates of 4.4%, 3%, and 1.5% in 2021, 2022, and 2023, respectively.

Indonesia demonstrated resilience with a slight contraction of -1.8% in 2020, followed by consecutive years of growth at 5.2%, 5.3%, and 4.9% from 2021 to 2023.

Myanmar experienced consistent growth from 2020 to 2023, ranging from 1.9% to 5.4%. Singapore faced a steep decline of -6.1% in 2020 but rebounded strongly with growth rates of 5.8%, 3.7%, and 0.7% in the subsequent years. Cambodia showcased impressive growth rates, starting with a contraction of -3% in 2020 but achieving growth rates of 6.7%, 5%, and 6.1% in 2021, 2022, and 2023.



Source: ASIAN Development Bank (2023)

Figure 1.3 GDP Growth of Southeast Asia in 2020-2023

Malaysia faced a challenging start in 2020 with a contraction of -5.2% but experienced a remarkable recovery, posting growth rates of 7.1%, 8.7%, and 3.3% from 2021 to 2023. The Philippines and Vietnam navigated through economic downturns in 2020 with contractions of -7.6% and 1.7%, respectively, but rebounded strongly in subsequent years, with growth rates ranging from 5.3% to 8.5%. These diverse economic performances across ASEAN member states underscored the region's resilience and adaptability amidst various challenges during the specified period.

From the preceding, the Indonesian economy supposedly multiplied because the economic conditions during the COVID-19 pandemic were not as bad as other ASEAN countries. Some countries could respond quickly and anticipate the crisis and therefore

the performance became uneven across countries. Indonesia's GDP after the pandemic showed improvement, but Indonesia's GDP growth was not higher than other AEC members, only reaching 5% in 2021 which was below the average of ASEAN GDP. This data information about G-20 and AEC shows that Indonesian IKM still have problems affecting their performance.

1.2.4 The Challenges of Industri Kecil Menengah (IKM) in Indonesia

Several studies in Indonesia succeeded in identifying the challenges faced by IKM such as increase in operational cost (Surya et al., 2021), lack of human capital and skilled workers (Capri, 2017), low productivity and failure to fulfil customer demands (Hernita et al., 2021), ineffective implementation of government aid program, limited financial ability and credit issues (Resmi et al., 2021), lack of technology adoption, and less innovation and flexibility (Budiarto & Pramudiati, 2018). To address these challenges to recover and concurrently evaluate IKMs' performance, including strengthening IKMs' competitiveness to be at par with those of developed nations in the past decade, the Indonesian government embarked on a commitment to support IKM.

The government supports several Policy and Development Program related to IKM as described in Tables 2.1 and 2.2 in Section 2.2. At the very first is Instruction of the President of the Republic of Indonesia in 2008 (Economic Policy Package I & II), followed with Master plan for Acceleration and Expansion of Indonesia Economic Development 2011-2025 (MP3EI) and the newest program is a Master plan of National Industry Development 2015-2035 in several related strategies such as Developing central regions of industrial growth, industrial-designated regions, industrial estates and centres of small and medium industry and providing affirmative action such as policy formulation, strengthening institutional capacity, and providing facilities to small and medium sector.

From all those Indonesian government programs and policies since 2008, Indonesia has been trying hard to become an industrial country and be equal to other high-income countries taking the first step to develop the HR capacity to achieve quality HRs. The quality of HRs includes handling the institution, good managerial and business management capabilities. In addition, with the backdrop of rising industrial growth, the Indonesian government is working on expanding Information and Communication Technology (ICT) commercial facilities and manufacturing technologies.

Furthermore, the government intervenes to guide the modern and technology-based economy to allow for the creation of new products or services and the design and development of new procedures. However, the results did not reach expectations. Information and technology implementation in Indonesian IKM face challenges or barriers in HR. Budiarto et al. (2018) stated that IKM in Indonesia have abilities to adopt technologies, but the operators who could run those technologies are few.

Notwithstanding this, the Indonesian Government also made a policy to make technology more accessible. However, the obstacles faced by IKM have not diminished regarding HR limitation. According to the World Bank Development Indicator in 2021, Indonesia's research funding accounted for barely 0.2% of total GDP. The rate was 2.5% which is significantly lower than that of high-income countries. Data from Indonesia Industry 4.0 Readiness Index reveal that Indonesia's research budget is below the 1.5% average of comparable middle-income countries. It seems that the majority of the industry did not consider the awareness of the importance of technology adoption and technological capability enhancement.

The recovery time after the COVID-19 pandemic outbreak is critical for businesses to introspect and make repairs and upgrades. Post-crisis improvement efforts can use comprehensive improvements based on the company's tangible or intangible resources. For example, HR improvements needed to keep the employees' level of knowledge is an important aspect and a substantial part of the company's continuous learning and improvement process such as literacy and turning the challenges into opportunities (Mostafiz et al., 2022). These improvements can accelerate achieving a high-income nation through the performance of IKM.

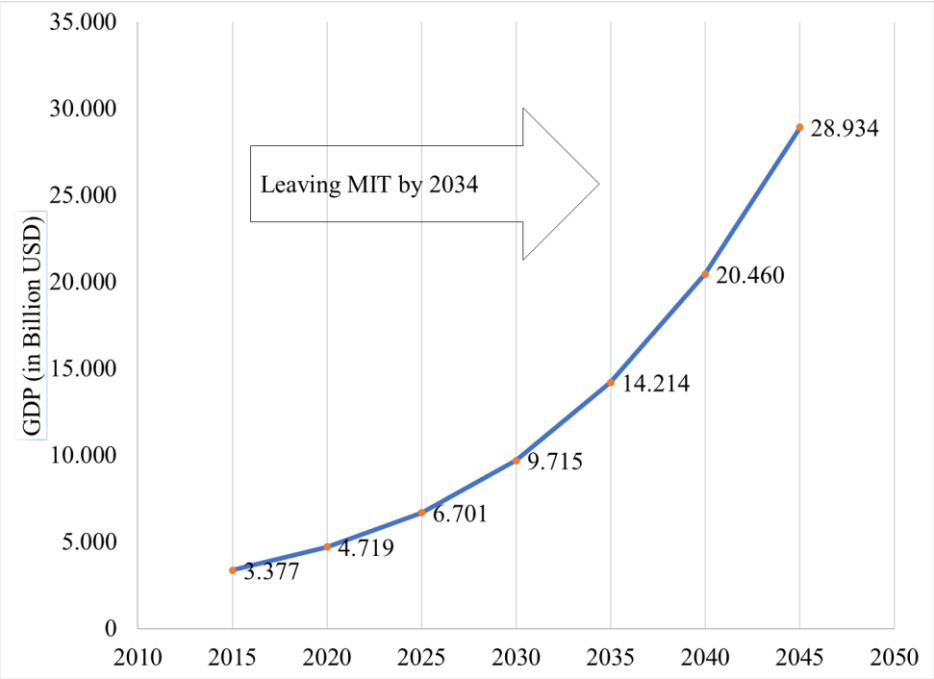
1.2.5 Indonesia Transition Becoming a High-Income Nation

In 2017, the Asian Development Bank (ADB) studied fifteen countries in Asia and Latin America that sustained an 8% yearly growth since 1960 and noted that only eight achieved high-income status. Eight of these countries, namely Hongkong, Republic of Korea, Singapore, Malaysia, Taipei, Argentina, Chile, and Uruguay contributed significantly to the respective country's GDPs. Over the past 50 years, countries in developing Asia have made more progress than any other region in their efforts to become middle-income economies.

Similar to the Republic of Korea and the Philippines, Indonesia began as a developing country but trailed behind these two countries in recent decades. The Republic of Korea, for example, effectively changed into a high-income nation and sophisticated economy, made a significant success due to the rapid spread of technological knowledge, and demonstrated consistency in executing economic strategies that promote entrepreneurship and infrastructure development (Hidayati & Rachman, 2021). Another essential element is that the Republic of Korea invests extensively in technology and HRs by utilising competitive advantages such as patents, utility models, unique designs, and trademarks. Although competitive advantage is not

a new insight, most firms, mainly small-medium businesses, do not focus on their advantage (Nikmah et al., 2021).

Indonesia is classified as a middle-income country with a modest score by 2021. Indonesia is at risk of falling into the Middle-Income Trap (MIT) due to a lengthy period of relatively constant economic income and a slight GDP achievement. MIT is a state in which an economy experiences a drop in economic dynamism after successfully moving from low to middle-income status and subsequently remains stable in the long term while attempting to enhance productivity and income. As a result, this prevents the economy from reaching high-income levels (Mogos et al., 2021).



Source: National Development Planning (2015)

Figure 1.4 Predicted GDP of Indonesia in Term of Global Economy Class

In the case of Indonesia, the next road to becoming a developed country remains challenging, and Indonesia is highly likely to become locked in MIT. Middle-income countries face two risks: a capital income trap between $10,000 - $11,000 billion and a per-capita income trap between $15,000 - $16,000 billion (Morgan et al., 2020). Figure

1.4 shows that Indonesia will enter a high-income country status by 2025 and be free of the threat of MIT by 2034.

Countries that desire to leave MIT must adhere to several criteria, including economic stability, progress, social cohesiveness, technological advancements, legal policies, institutional rules, and long-term development. Based on this study, Indonesian IKM must improve their overall business activities. For countries that are looking for the perfect ingredients to grow more successfully, the Republic of Korea is a good example to study. Focusing on heavy industry it went from a middle-income to a high-income country. To achieve this, IKM needs the right strategies for their business.

Given its economic importance, every Indonesian IKM expects to have a competitive advantage. Companies are encouraged to comprehend changes in their structure and choose effective measures to sustain their competitive position in the face of rivals as a result of the increased competition. Companies must continue to evolve under existing changes and adapt to dynamic, ever-changing environmental conditions (Ministry of National Development Planning, 2021). Businesses must have effective and efficient tactics to stay competitive and get a competitive advantage.

Several studies reveal that to become a high-income industrial country that produces value-added for manufacturing, countries must collaborate to improve competitiveness by creating a favourable business climate, increasing industrial technology capabilities to encourage quality, efficiency, and productivity improvements, and supporting raw materials, energy, HRs, and financing (Srikalimah et al., 2020). Furthermore, dwindling non-renewable natural resources, strict environmental, occupational health, and safety requirements, and increasing customer demand for more ecologically friendly products are also characteristic of high-income

industrial countries closely related to the achievement of sustainability performance (Eweje, 2020).

There is a need to understand the factors to enhance the sustainability performance of Indonesian IKM. Hence, this study intends to examine the factors and impacts of competitive advantages on sustainability performance from the perspective of Indonesian IKM. Specifically, this research investigates the driving factors which are financial and technological literacies as an intangible resource and the organisation's capability. Subsequently, this study determines the role of competitive advantage as a mediator of sustainability performance in economic, environmental, and social dimensions. Next, this study analyses the mediating role of competitive advantage, and sustainability performance relationships.

1.3 Industri Kecil Menengah (IKM) in Indonesia

The industry comprises all types of economic activities that processes raw materials and utilises resources to generate items with added value or higher advantages. This is the definition according to Law No. 3 of 2014 and Permenperin 64/M-IND/PER/7/2016. Table 1.1 shows the classification of the Indonesian industry. This research defines Manufacturing SMEs based on employment size because it is easier to measure.

Table 1.1 Indonesian Industry Classification

Type of Industries	**Investment Value (Billion IDR)**	**Number of Employees (Person)**
Micro	Less than 1	5-19
Small-Medium	1 – 15	20-99
Large	More than 15	More than 100

Source: Central Agency on Statistics Indonesia (2020)

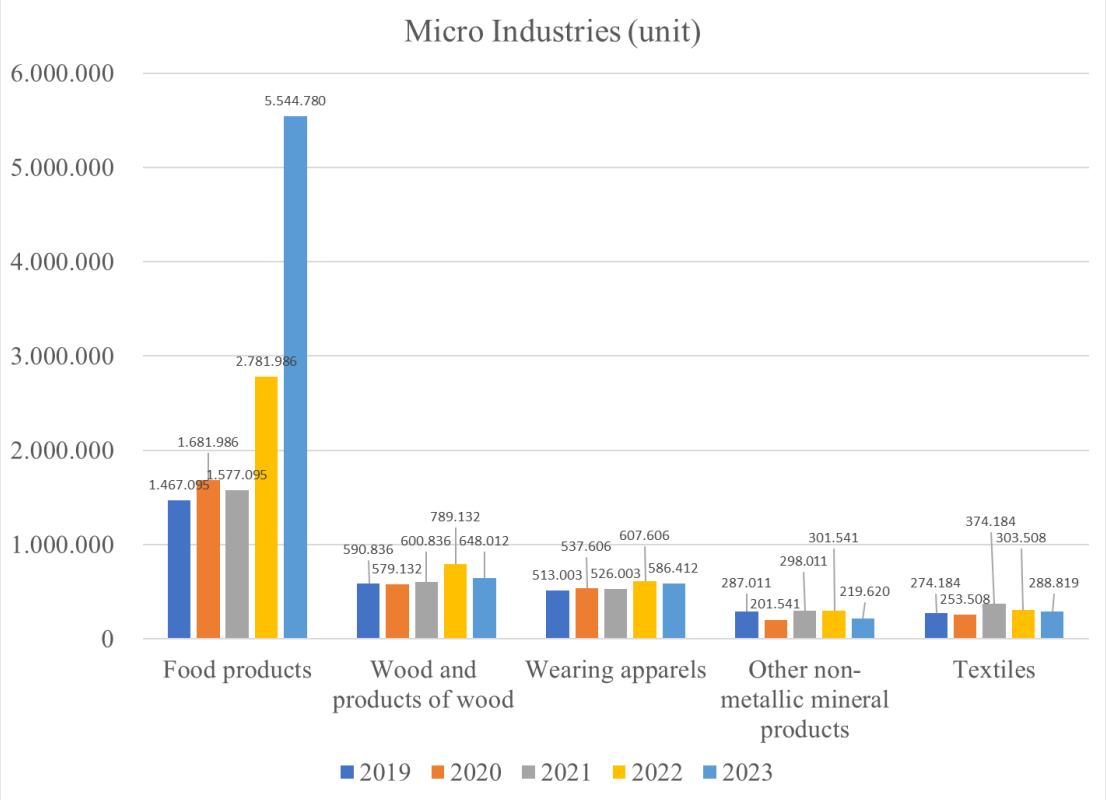
Many varied definitions of SMEs and Industry might be confusing. The most acceptable term is yet agreed upon by policymakers and researchers. The Ministry of SMEs and Cooperatives of Indonesia utilises net asset or total sales thresholds to classify a company as an SME. This term is helpful for corporation taxation. However, many small businesses do not keep extensive business records, making it difficult to collect precise data measures. It is an easier way to track how many people are employed.

IKMs mainly are local companies. There might be foreign investment in IKMs, either through partnerships, joint ventures, or direct investment by multinational corporations (Hanggraeni & Sinamo, 2021; Irjayanti & Azis, 2012; Niode, 2009). In such instances, while the investment may come from abroad, the operations of the enterprise are still classified as part of the IKM sector if they meet the criteria of being small or medium-sized and contribute to local economic development.

The industrial sector's economic activity is mainly concentrated only in manufacturing. It can be an SME if the industry has direct production and marketing activities. The Indonesian manufacturing industry is divided into 24 sub-sectors. Figures 1.5, 1.6, and 1.7 explain the three largest manufacturing sub-sector of micro, small-medium, and large companies from 2019 to 2023 in Indonesia.

A minimum workforce of four persons is required in the micro-scale manufacturing business. The owner or manager of the industry is usually the head of the household or his family members and there are limited marketing locations. This industry has minimal capital and limited use of technology in its production process. The crew comprises family members and the owner or manager of the industry is usually the head of the household or one of his family members. The weaving,

handicraft, tempe/tofu industry, and brick/tile industries are examples of micro-enterprises.

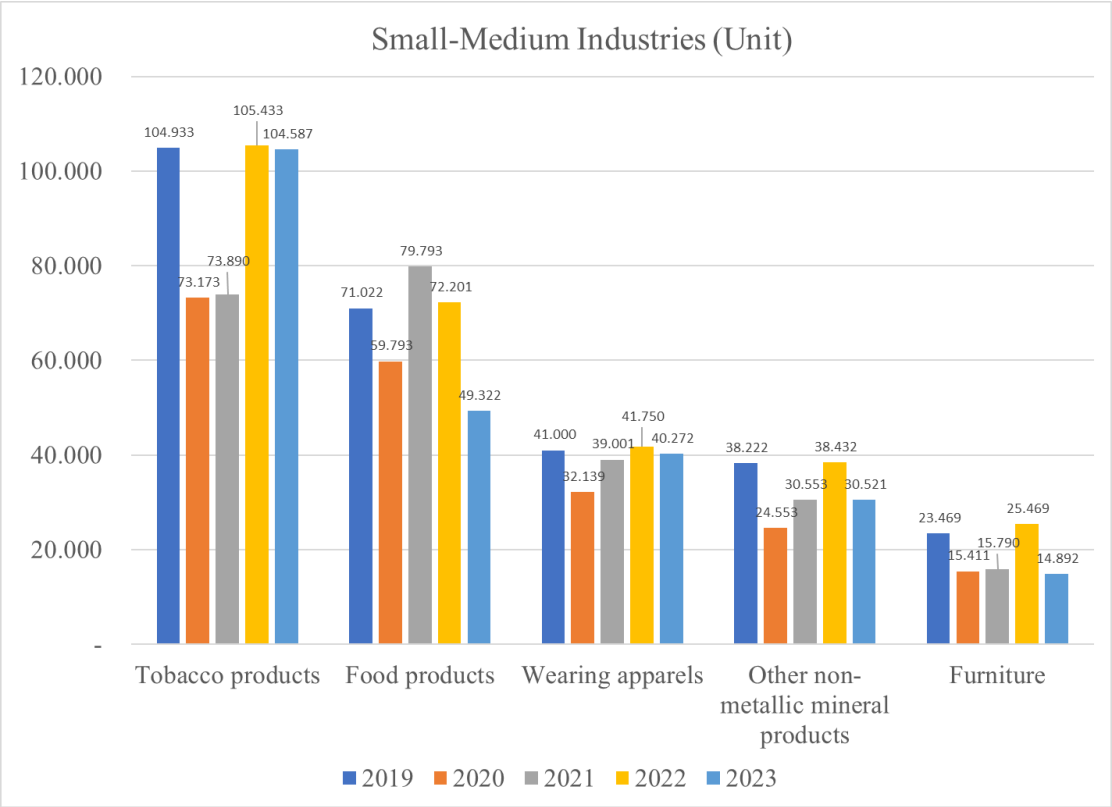


Source: ASEAN Statistical Yearbook (2023)

Figure 1.5 Number of Micro Manufacturing Industry by Sub-Sector in 2019-2023

According to Figure 1.5, the most micro-scale industries are those that produce food and beverages, forests and wood products, and clothing. Food and beverage producers are the largest in this industrial scale compared to other industries (small-medium and large-scale industries).

The small-medium scale manufacturing industry employs between 20 and 99 persons. A small-medium industry has sufficient cash, uses simple technology in the manufacturing process, produces simple products, employs people from the surrounding area who are not permanent but have certain capabilities, and has firm leaders with specific managerial competencies. The convection business, embroidery industry, and food processing sector are examples of small-medium industries.

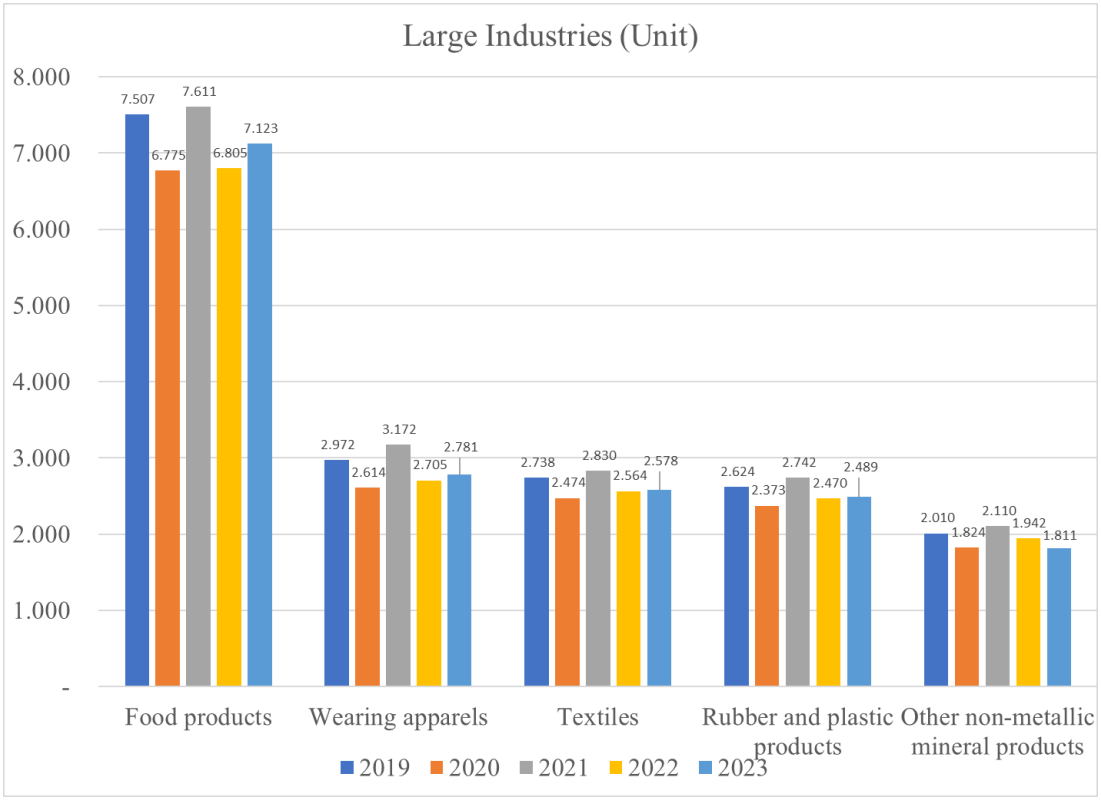


Source: ASEAN Statistical Yearbook (2023)

Figure 1.6 Number of Small-Medium Manufacturing Industry by Sub-Sector in 2019-2023

According to Figure 1.6, most small-medium scale companies manufacture tobacco, food and beverage items, and clothing. Tobacco product producers are the largest on this industrial scale compared to other industrial scales (micro and large-scale businesses).

The textile, automobile, steel, and aircraft industries are examples of big industries. Food production, textile, rubber, and plastic items are the most large-scale industries, according to Figure 1.7. Food production is the largest with considerable industrial-scale compared to other industrial scales (micro and small-medium scale industries).



Source: ASEAN Statistical Yearbook (2023)

Figure 1.7 Number of Large Manufacturing Industry by Sub-Sector in 2019-2023

In Indonesia, IKM plays a pivotal role in the national economy, complementing the substantial contributions of larger industries. While large-scale industries are often highlighted for their significant contributions to GDP and value addition, accounting for approximately 70% of total GDP, SMEs are indispensable in driving local economic development and job creation. IKM, which represents about 99% of all business entities in Indonesia and employs 97% of the domestic workforce, excel in capitalizing on niche markets (Ministry of National Development Planning, 2021). They are particularly vital in rural areas, providing employment and fostering economic diversity across the archipelago. This balance between the extensive economic influence of large industries and the grassroots impact of IKM underscores the unique and comprehensive structure of Indonesia's economic landscape.

The negative impacts of industrial activities are not exclusive to large enterprises in Indonesia; small and medium-sized enterprises (SMEs), or IKMs, also contribute to

environmental and socioeconomic challenges. While large enterprises often implement more regulated and efficient waste management systems due to stricter compliance requirements and more significant resources, IKM may need more practices in resource consumption and waste disposal. This discrepancy can exacerbate environmental degradation and widen socioeconomic disparities, particularly in rural and underserved areas. Rampant resource consumption and insufficient waste management practices in some IKMs can strain local ecosystems and compromise community well-being, necessitating a balanced approach to economic development that considers these enterprises' contributions and environmental footprint (Kementrian Perindustrian, 2020).

There is an increasing recognition among owners of Indonesia's IKM about the importance of SDGs. Many IKMs proactively implement measures to reduce their environmental footprint, enhance social equity, and boost overall sustainability. Such concerted efforts highlight these enterprises' crucial role in fulfilling broader national development objectives (Sumiati, 2020). In contrast, while contributing significantly to economic output, large industries in Indonesia face distinct challenges and responsibilities in aligning with global sustainability standards (Gunawan et al., 2022). These larger entities must leverage their substantial resources and broader influence to adopt more sustainable practices, setting industry benchmarks. Both IKMs and large industries need to synergize their unique advantages, agility and innovation in IKMs and resource abundance in large industries to ensure Indonesia meets its sustainability commitments on both a national and global scale.