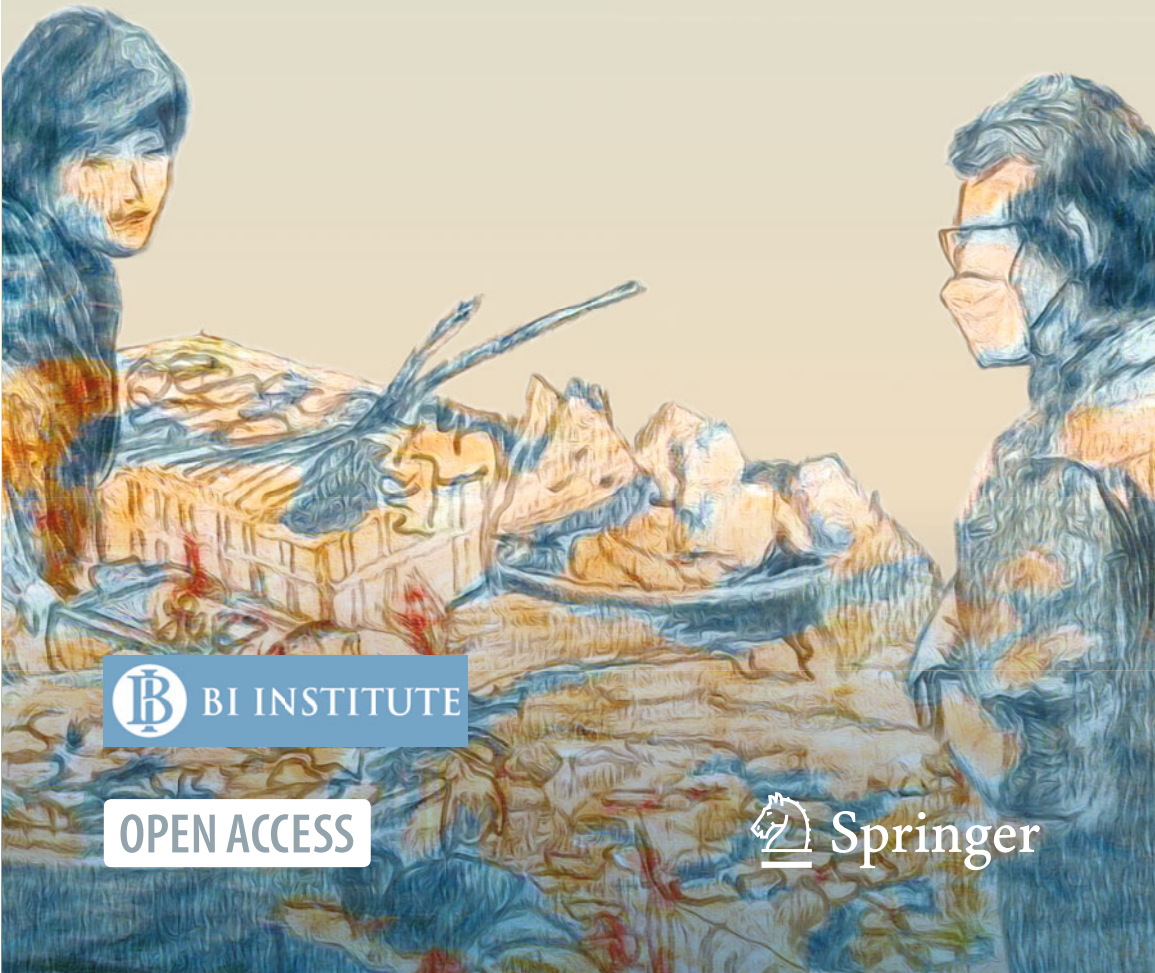


Iwan J. Azis

Listen and Design

On Micro, Small and Medium Enterprises

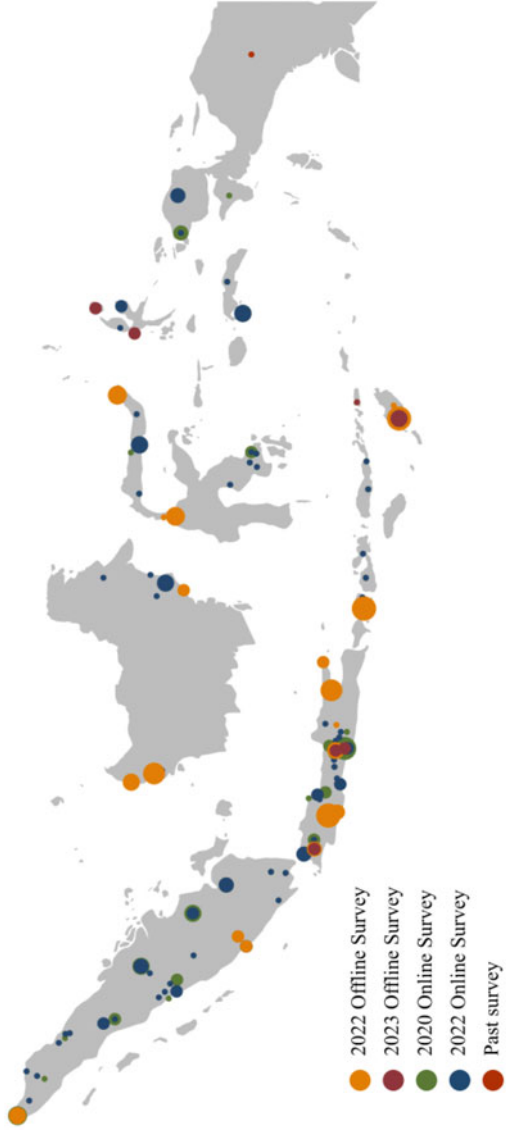


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Listen and Design



Survey Locations

Iwan J. Azis

Listen and Design

On Micro, Small and Medium Enterprises

 Springer

Iwan J. Azis
Dyson School of Applied Economics
Cornell University
Ithaca, NY, USA



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*They would not listen they did not know how
perhaps they'll listen now*

—DM

*Listening to pay attention bring us insight
and connection*

—IJA

Foreword

The importance of Micro, Small, and Medium Enterprises (MSMEs) cannot be overstated, both for the economy as a whole and the welfare of individuals. MSMEs constitute 60.3% of Indonesia's GDP and play a crucial role in maintaining economic stability. They hold the potential for innovation, fostering competition, and enhancing productivity. Moreover, MSMEs are crucial for improving individual welfare, with 65 million operators making up 97% of Indonesia's labor force absorption. Therefore, fostering and supporting the growth of MSMEs is crucial for building resilient and inclusive economies and improving lives.

While MSMEs have made some progress in recent years, their welfare remains preeminent strategycarious due to a host of old and new challenges. Some of these challenges are considered "classic" hurdles, including credit constraints, supply chain frictions, and institutional barriers. However, MSMEs must also deal with the rapid pace of technological advancements and increasing global connectivity, both of which offer opportunities and threats. Supply chain volatility stemming from geopolitical events and natural disasters also presents significant challenges, disrupting operations and affecting MSMEs' resilience. Moreover, MSMEs must adapt to the impact of climate change, especially those operating in vulnerable sectors. Addressing these multifaceted challenges is essential to secure the welfare and sustainability of MSMEs, enabling them to thrive and contribute more effectively to the economy and society.

The Government of Indonesia has implemented numerous policies to support MSMEs. These policies involve material assistance directly targeted toward MSMEs, such as microcredits and technical assistance, as well as general programs that benefit MSMEs, like improvements in infrastructure and the rule of law. Bank Indonesia actively participates in these efforts to control inflation from the supply side, realize the potential of export-oriented small businesses to reduce Indonesia's current account deficit, and support financial system stability by providing MSMEs with financing access in line with its central bank mandate. Bank Indonesia has implemented a range of policies aimed at supporting MSMEs by offering guidance, resources, and access to markets to navigate the various challenges they face. With 46 local representative offices, Bank Indonesia is actively involved in nurturing and

facilitating over 1200 MSMEs across Indonesia's diverse islands, assisting MSMEs operating in sectors ranging from primary agriculture to traditional weaving.

However, the question arises: Are these policies aligned with the actual needs of the MSMEs? While this question seems simple, the answer can be elusive. For one, the interplay between policies means that policy preferences cannot be considered in isolation; instead, we might need to review how MSMEs perceive policy mixes. Moreover, the requirements of MSMEs can vary significantly depending on their specific contexts and states. In some cases, MSMEs may not even have the incentive to reveal their true state or needs. Therefore, the challenge lies in how the government can design policies that are tailor-made to align with the unique and evolving needs of the target MSMEs. Implementing mechanisms for gathering accurate and up-to-date information on the ground realities of MSMEs and engaging in inclusive consultations with stakeholders can aid in formulating policies that truly cater to the demands of MSMEs.

To bridge this gap and ensure policy alignment with the actual needs of the target MSMEs, we present "Listen and Design: On Micro, Small and Medium Enterprises." This book aims to enhance the understanding of the complex challenges faced by MSMEs among policy-makers and academicians and seeks to provide insights for formulating more targeted and effective policies. The book aims to shed light on the intricacies and nuances of their needs by delving into the diverse contexts and states of MSMEs. We hope this book will serve as a comprehensive medium of learning for academicians and policy-makers and benefit the MSME community.

This book comprehensively explores policy relevance for MSMEs, building upon its predecessor by delving into practical implementation and mechanisms. In "Periphery and Small Ones Matter," Prof. Iwan Jaya Azis highlighted the importance of designing policies that match prevailing institutions, one of which is existing social capital. This edition delves into how we can design such policies. In this book, he utilizes insights from mechanism design theory, as created by Nobel laureates Leonid Hurwicz, Eric Maskin, and Roger Myerson, to show how MSMEs and social planners can achieve desirable outcomes given the constraints of individuals' self-interest and incomplete information. This theoretical insight is enriched through insights from surveys of over 100, as well as in-person interviews with MSMEs throughout Indonesia. Through its evidence-based approach and incorporation of mechanism design theory, this book serves as a crucial stepping stone toward policy relevance and impactful decision-making for the MSME sector.

In conclusion, MSMEs undoubtedly play a crucial role in our economy, but we must remember that they still need support. Implementing policies for their benefit requires a thoughtful and informed approach; otherwise, these policies might end up doing more harm than good. Hence, it becomes imperative for us to actively listen to and engage with the MSME community. By genuinely understanding their needs and challenges, we can design and execute policies that empower and uplift them.

Jakarta, Indonesia

Perry Warjiyo
Governor of Bank Indonesia

Acknowledgements

This book wasn't really planned. The main issue discussed was already covered in "Periphery and Small Ones Matter" (Springer, 2022), in which the key proposition was for social planners concerned with micro, small, and medium enterprises (MSMEs) to avoid making policies not compatible with the prevailing social capital. As soon as that book was launched, I was confronted with a follow-up question: "What would be MSME policies that are compatible with the existing social capital?" Fair question. But it requires deeper analysis to answer. Hence this book.

I am extremely fortunate and thankful for having so many incredible and eager-to-talk MSMEs as my respondents during the surveys for this research. This book is dedicated to them. They operate in many regions across Indonesia, from Aceh in the west, to Papua and Alor in the east, from Morotai in the north, to Boti village in the south. Their answers and expressions helped me to understand better not only about the complexity of problems they are facing, but also the ignorance of those who often recommend solutions with no regard toward the level of intellectual hardship (the cognitive tax) of many MSMEs.

It was back in 2018 when Bank Indonesia Governor, Dr. Perry Warjiyo asked me to help elevate the research activities within Bank Indonesia Institute (BINS). In the following year, I began spending a few months each year in that Institute. "Periphery" and this book are the products of those visits. I thank him for the opportunity. I also thank Destry Damayanti, MSc, Senior Deputy Governor of Bank Indonesia, for her encouragement, and Doni P. Joewono, MBA, Deputy Governor of Bank Indonesia for the support and facilitation provided by Bank Indonesia's regional offices during the surveys.

In conducting the research for this book, I benefited immeasurably from the help and assistance of BINS under the leadership of Dr. Yoga Affandi. I cannot thank him and his staff enough for making my work so easy and run smoothly. I would also like to acknowledge the supports from the head of research center of Bank Indonesia, Dr. Iman Gunadi. Discussions and exchange of ideas with Ms. Yunita R. Sari, MBA, Director of MSME Development at Bank Indonesia, and her team, is highly appreciated. I would also like to express my gratitude to Dody BudiWaluyo, MBA, for his support at the early stage of book writing.

For the research work itself, I sure feel grateful having an amazing professional fun squad of a research team in my corner under the gracious coordination of Dr. Arnita Rishanty, whose members are RetnoWicaksono M.Sc., Amira Zaranadia M.Sc., Roes Ebara Gikami Lufti SE, Hardy Salim SE, and Marsha Violeta SE. They were imbued with fervor to uphold the assignments and worked tirelessly to make sure what is reported in the book matches the results of the model, and is consistent with the information picked up from the field survey. Despite occasional stumbles, they have given their maximum efforts. It is almost impossible to write a book that integrates primary data and model-based analysis without relying on the hard work and understanding over both approaches. I am deeply thankful to them!

A number of local BI and BINS staffs who accompanied me in so many field surveys did a marvelous job to make the journeys safe and enjoyable, no matter how rugged the terrain was (*Boti* village in East Nusa Tenggara and *Baduy Dalam* tribe in West Java), how devastating the suffering of our respondents (post-major earthquake and tsunami in Palu, Sulawesi), how significant the effect of climate change on MSME activities (coffee farmers in Takengon-Aceh, and salt famers in Madura island), and how frustrated the local residents felt over the rising costs of living (fishermen in Morotai, and housewives in Galo Galo island-North Maluku). All the field surveys were also made easier by the excellent coordination work done by BI's local offices (KPw), for which I am very thankful. Many KPw consultants were also very helpful to our fieldwork. Some of them even went the extra mile to get the additional information I need. I thank them for that.

My heartfelt thanks also goes to Fawzy Siddik and Ralph Christy who provided useful suggestions during the field interviews in some regions. They both endured the struggles I had in trying to meet the deadline to finish the book while doing a trip together to a beautiful mountain area (sorry if I spoiled the trip guys, and thanks for helping me not to lose my items). I also appreciate the discussions on the IV model with Fauzi Estiko and few edits by Nur Ain. My walking-buddy Mike Kniffin always generously shared his wealth of artistic knowledge that I took the benefit of. Thanks Mike. I would also like to thank Hayley Hughes for her creativity, attention to detail, ability to listen and understand my vision, and translate my sketches into the cover design of the book. Thank you for your exceptional talent and incredible work Hayley.

Last but not least is to my family. I am grateful to my two children, Mirko and Mariko, for their love and encouragement. As for my wife, Erina, I find it difficult to express my appreciation because it is so boundless. She is my best friend and cheerleader with whom I discussed ideas, including some in this book. She stood by me through all my travails, absences, and impatience, and prevented me from taking wrong turns. Love you all.

Lessons From People's Heart

Professor Iwan Azis traveled and spent time in various regions throughout Indonesia almost every year. He has been teaching at Cornell University since early 1990s and is currently involved in the Emerging Market Program at the same university. He also teaches (online) at the University of Indonesia. Combining his teaching duty with the fresh information obtained from the field surveys made his teaching and research so much interesting. One of his current topics of research on development focuses on micro, small, and medium enterprises (MSMEs). This book reports the findings of that research, including the results of the surveys conducted during the last few years on hundreds of MSMEs throughout Indonesia.

He found a mismatch between the preferences of MSMEs and those implied by the government policies. Arguing that this mismatch is key to understanding the gaps between the good intentions of policies and what they actually achieved, he shows by using a particular approach and model that the mismatch can be narrowed by transforming those preferences in such a way that they will be in line with one another. For that to happen, however, he emphasizes the need to listen directly to MSMEs and absorb what they are saying without inserting our judgments. This step should be done before designing any appropriate policy.

Throughout the book, it is shown that by taking this approach we can enrich our understanding—and get the real picture—of the problems and challenges faced by MSMEs. Incorporating such information into the policy-making process could help narrow the gaps between policy intention and achievement.

From the experiences in conducting field interviews with MSMEs and village communities, it was learned that the nature of responses from the interviewees depends very much on the position or the perceived closeness of interviewers with government officials. The more the interviewers being perceived as being close to policy-makers, the more officially oriented the answers become. To avoid this, in the current study Professor Azis made special efforts to have direct face-to-face dialogs instead of conducting standard interviews in an official setting. Through this approach, he was able to acquire true and honest responses from the interviewees. At the same time, he found several cases where some problems faced by MSMEs could actually be resolved by using a simple intervention from the local government without

the need for additional funding from the local budget; it just requires an honest and open dialog with genuine intention and heartfelt commitment of the policy-makers to really find the real solution to the problems. What this implies is that, attempts to resolve development problems, including problems faced by MSMEs, should not be limited to scientific endeavor but must also be accompanied by listening to people's heart.

Before conducting the survey, the questionnaire was scrutinized to avoid asking questions on issues that are not really of major concerns to MSMEs, no matter how frequent those issues have been raised and exposed by analysts and policy-makers. After going through the whole process, the results of the survey turned out to show that social capital is the most important factor to include in the list of factors to consider when making policies for MSMEs. Many policies intended to help MSMEs (e.g., cheap loans, product promotion, infrastructure, training, or greater access to digital technology) failed to meet the intended goals when the design and implementation of those policies were done without considering the kind of social capital that existed in the community. Among several types of social capital, networking is considered the most critical one, followed by infrastructure and legal (regulatory) supports. Creating a network is even considered more important than providing supports for financing or other measures. All these were expressed by the MSMEs themselves.

To test the validity of it, the study subsequently applied another model using secondary data and variables that include the role of traditional ethnic communities—to reflect the local cultural traits. The results confirmed the supremacy of social capital, and the model also corroborated the significance of ethnic communities in affecting MSME activities. This finding is very significant for a country like Indonesia that has many indigenous ethnic groups who continue to perform ethnic rites and customs that may have some bearings on some features of MSME operations.

On reflection, by combining the economic and ethnographic-like approach this study has uncovered the true conditions of MSMEs in Indonesia and their problems, the policy measures required to resolve those problems, and the mechanism or process to ensure that those policies can be implemented. At the same time, the analysis provides a deep and comprehensive understanding about the culture of people involved in MSMEs activities, and the natural setting where those activities take place.

Development should be people-centered, reflecting the fundamental concern with institutions, policies, and processes, while at the same time respecting the agency of all individuals. Such a notion is embedded in the book's message that calls for listening to people's heart before designing policies. This makes the book a must read for readers and policy-makers in Indonesia and other countries. It is an essential reading for development specialists in international organizations and other institutions alike.

Emil Salim
Former Minister and Advisory Council to the President of Indonesia
Chair of the World Bank's Extractive Industries Review (EIR)
Emeritus Professor at the University of Indonesia
Chair of the Foundation for Sustainable Development and the Kehati Foundation
Jakarta, Indonesia
October 2023

Testimony

The role of micro, small, and medium enterprises is crucial in contributing to the development process. Early in the structural transformation, these enterprises are in the informal sector and gradually move into the formal sector as they learn more efficient business practices. The important contribution of this book is that it successfully searches for policies that can speed up this process and make these enterprises more efficient and productive. The methodology used by the author is original in at least two ways. It relies, first, on careful interviews with multiple owners of these firms to understand better their decision-making process and, secondly, it relies on an analytical hierarchy technique to unveil the best policies to reduce transaction costs and accelerate the growth of these firms. The most preferred policy yielded by this method calls for the creation of a network for greater interaction among these enterprises so that they can learn from one another and grow into larger and more productive firms. This book deserves to be read by researchers and policymakers interested in micro enterprises.

Erik Thorbecke
H.E. Babcock Professor of Economics (Emeritus)
Cornell University

The eminent Cornell/University of Indonesia economist Professor Iwan Jaya Azis has made yet another substantial and original contribution to the literature on economic development with special reference to Indonesia. This study, on micro, small and medium enterprises (MSMEs), is a continuation of his life-long professional career, to focus on key development and policy issues. Ever since Independence, Indonesia has grappled with the challenge of how to foster a dynamic small enterprise sector. Many well-intentioned programs have failed. As implied by the title, Professor Azis advocates an approach to listen, that is, to talk to the actors in a variety of economic and ecological settings, and to design policies accordingly. All too often, this seemingly obvious methodology has been ignored in favor of a top-down approach in many countries, Indonesia included. The result is a skillful blend of forensic and sophisticated socio-economic analysis, employing innovative quantitative techniques. This

framework is employed to address the challenge of lifting productivity in these enterprises, recognizing also the utility of social capital in fostering a more dynamic business environment. It is a pleasure to recommend this volume to a wide readership.

Hal Hill

*H.W. Arndt Professor Emeritus of the Southeast Asian Economies
Crawford School, Australian National University*

There have been many analyses and studies on MSMEs, but Iwan Azis' book tops them all in terms of evidence base, innovative approach with the AHP and ANP methodology - something the author has worked for decades, and most of all written with the heart by recognizing that people are at the center of development and the importance of social capital. The result of this study should reveal how many government policies to address MSME have not been effective as they have not been designed by listening to the needs, co creating the policy design with stakeholders and having very much in mind the institutional and social capital that will enable the effectiveness of the policy implementation. This is an incredible reference for all stakeholders from governments, networks of MSMEs, facilitators, and all those who care about people and community centered development.

Mari E. Pangestu

*Former Trade Minister of Indonesia
and Managing Director of Development Policy and
Partnerships, World Bank*

Iwan Azis's "Listen and Design" is another great new book of his. Opportunity and prosperity have been illusive in many developing and emerging countries because the micro-, small-, and medium enterprise (or MSME) sector-the sector which employs most people and which is the entry point for many new entrepreneurs- has not shown the growth and productivity increase that was needed for rapid development. This is despite many government programs.

The book makes three essential contributions: First, and building on its predecessor "Periphery and Small Ones Matter", it shows that the success of policy programs requires understanding the prevailing social capital. Money, infrastructure, training and technology yield the best results when the related policies are designed consistent with the prevailing institutions and social capital. To do this requires listening to MSMEs so as to "align the preferences of enterprises and policy makers." Hence, the title of the book which provides valuable guidance on this as the second contribution.

Adapting economic principles and policy design to local institutions is analyzed in the Indonesian context but it applies much more broadly. This is the third, great contribution of Iwan Azis book for all development economists and policy makers.

Ludger Schuknecht

*Former German Federal Ministry of Finance,
ex-OECD Deputy Secretary-General, and
currently Vice President and Corporate Secretary of the AIIB*

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Abbreviations

2SLS	Two Stages Least Squares
AHP	Analytic Hierarchy Process
ANP	Analytic Network Process
BCA	Bank Central Asia
BI	Bank Indonesia
BNI	<i>Bank Negara Indonesia</i>
BRI	<i>Bank Rakyat Indonesia</i>
DUPK	<i>Departemen Pengembangan UMKM dan Perlindungan Konsumen</i> (Department of MSME Development and Consumer Protection)
GFC	Global Financial Crisis
IFC	International Finance Corporation
IV	Instrumental Variables
KUR	<i>Kredit Usaha Rakyat</i>
MDT	Mechanism Design Theory
ME	Medium Enterprise
MSE	Micro-Sized Enterprise
MSME	Micro, Small, and Medium Enterprise
NPL	Non-Performing Loan
P2P	Peer-to-Peer
PJSP	<i>Penyedia Jasa Sistem Pembayaran</i> (Payment System Service Providers)
QRIS	Quick Response Code Indonesian Standard
SAKERNAS	<i>Survey Angkatan Kerja Nasional</i> (National Survey of Labor Force)
SCF	Social Choice Function
SCR	Social Choice Rule
SKLU	<i>Survei Laporan Keuangan UMKM</i> (MSME Financial Report Survey)
SWF	Social Welfare Function
WTO	World Trade Organization

List of Economic Sectors

ACCOM	Accommodation and Food Service Activities
AGRI	Agriculture, Forestry, and Fishery
CONS	Construction
EDUC	Education
ELEC	Electricity and Gas Supply
FINC	Financial and Insurance Services
GOVT	Public Administration and Defence; Compulsory Social Security
HEAL	Human Health and Social Work Activities
INFO	Information and Communication
MANF	Manufacturing
MINQ	Mining and Quarrying
OTHR	Other Services Activities
REAL	Real Estate Activities
SERV	Business Services
TRAD	Wholesale and Retail Trades, Repair of Motor Vehicles and Motorcycles
TRANS	Transport and Storage
WATR	Water Supply, Sewerage, Waste Management, and Remediation Activities

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Chapter 1

Introduction



Consider this book as an accompanying guide to a journey.

The journey is about listening to micro, small, and medium enterprises (MSMEs) across Indonesia, and designing mechanisms that could make the social capital-compatible policies implementable. The primary goal is to enhance the MSME productivity. In particular, the analysis highlights the importance for social planners and those who genuinely intend to help MSMEs to listen, feel, and understand the mental bandwidth of MSMEs, so that the gaps between what the policies are intended to achieve and what they actually accomplish can be narrowed.

There are complex problems and multiple challenges faced by MSMEs. Some of those problems and challenges cannot be resolved by simply providing financial supports or allocating resources for training, promotion, digital technology, and infrastructure, without considering the prevailing institutions that guide how those resources are managed and influence each other. The way the whole processes of using those resources are organized could be key to achieving the intended goal, and it is crucially determined by the social capital as part of the institution's continuum. Understanding the prevailing social capital to derive policies compatible with it is therefore critical, and so is designing the mechanism to implement those policies. It is shown in the book how a set of policies compatible with the social capital are elicited by directly listening to MSMEs and obtain their perceptions, and how to derive and design the mechanisms that could bring those policies align with the diverse preferences of respondents and social planners.

Before taking the journey into the analysis, let us first take a high-level view of some facts and myths about MSME, and the general mapping of MSME in Indonesia.

1.1 Facts, Myths, Productivity, and Social Capital

There are facts and myths about MSME.

What are the facts? Despite their smaller per-unit output compared to that of larger firms, MSMEs are an important contributor to growth and employment in

many countries. The much bigger number of units makes MSMEs' contribution to total GDP fairly substantial. The number of jobs created is also significant. Globally, it accounts for two-thirds of all jobs. It has been recorded that they created the majority of new jobs everywhere. All these numbers get higher when we include informal MSMEs under which many microenterprises are usually classified.

But it is also a fact that the inherent performance of most MSMEs has been less than favorable. Many of them operate in the informal sector, unregistered, and difficult to be reached by policies and programs intended to help them. Data sources did not always differentiate between formal and informal units, making it difficult to obtain the true and complete picture of their conditions. Majority of formal MSMEs are credit constrained and have a lower propensity to export. More importantly, their productivity is low and their network is poor. Of course one has to be aware of the variations in MSME definition and characteristics between countries, sectors, and status (formal or informal).

Then there are a lot of myths going around. When it comes to MSME resilience, for example, it is often conjectured that in a difficult time (crisis) MSMEs contribute to economic resilience. True that the nature of business operations of MSMEs are generally more flexible, partly because of their informality, but it is equally true that many governments tend to put greater efforts to support and rescue MSMEs in a crisis, either because of their large share in total business establishment (over 99% in Indonesia), or because it is politically risky for doing nothing about it. Crisis or no crisis, supporting small businesses that employ a large number of low-income workers is politically appealing. Some also believe that helping MSMEs can achieve other objectives such as reducing income inequality and poverty. The truth is, we cannot be certain about MSME resilience until we have reliable estimates about how their conditions would have been had there been no government supports.

What about the increased number of MSME units in the midst and after the crisis? In Indonesia, during the period of pre-COVID (2018) to COVID (2021) the number of MSME unit increased by over 5%, and the number of employee increased by a whopping 27%. Isn't that an evidence demonstrating the sector's flexibility and resilience? One needs to untangle the demand-side and the supply-side motivations. The supply side is rarely analyzed as it is more difficult to identify, let alone measure, the degree of "willingness" of the incumbent MSMEs to absorb newcomers. The "free entry" nature of MSME market makes it less relevant to investigate the issue. It is the demand side that is more relevant to analyze. Some segments of society had no choice but to do something to earn money during the COVID crisis, and many of them ended up doing small businesses. Hence, the increase in the number of MSME unit during and after the crisis should not be interpreted as a sign of resilience, rather it was more likely driven by a necessity to survive for many people whose socioeconomic condition had worsened during the pandemic. We should be wary in declaring something about MSME resilience in times of crisis. Anecdotal stories may support the case, but the preponderance of evidence is still lacking. At the very least, the conjecture is premature if not disputable.

What is certain is that, MSMEs are often impacted more than large businesses during a crisis. In the 2008 Global Financial Crisis (GFC), for example, export-

oriented MSMEs and those relying on imported inputs suffered the most as the impact of the slow-down in many countries worked through the trade channel, e.g., falling global demand including tourism, and increased production costs in trading partners. Compared to large businesses, MSMEs had to face greater difficulties to overcome those problems as they did not have a network to rely on for help. During the COVID pandemic, the simultaneous occurrence of supply and demand shocks also impacted the MSMEs more than large businesses. Although necessary, the restrictive policies (e.g., lock down, physical distancing, etc.) simply exacerbated the impact. As many MSMEs suffered globally, the living standards of millions of those involved in their operations got worsened.

As far as the living standard is concerned, productivity matters the most. The link between the two and between both of them and growth is undisputable. Acceleration or deceleration of one affects the other in the same direction. Greater productivity enables higher profits for firms and higher consumption spending for consumers. It also means lower working hours at either the same level or higher level of income earning. Keeping factor proportions unchanged, a simple arithmetic suggests that the growth of labor productivity is the only source of lasting growth of per capita income. This applies to all activities of MSMEs. For the farm sector, Timmer (2015) argued that higher productivity for smallholder farmers is even more important because it will have a significant and sustainable impact on food security. Alas, it is precisely on productivity that most MSMEs had an upsetting record. Many of them suffered from a much lower productivity compared to that of larger firms, and the gap widened overtime despite all efforts directed to help them. As a result, MSME contribution to the national growth was smaller than the potential.

The evidence from the past also shows that in each crisis the shock was always followed by falling investment and lasting labor productivity losses. This occurred clearly during and after the GFC in 2008 where the growth of labor productivity fell steeply. In emerging market and developing economies, the decline was prolonged and broad-based, reflecting the weakness in investment and a deceleration of total factor productivity (Dieppe, 2021; Dieppe et al., 2021). The post-COVID trend is expected to show a similar pattern. However, the severity and broad-based nature of the shock warrants a careful interpretation of the published data. Many MSME during the COVID pandemic suffered from shortage of cash flow, outright losses of employment, and a sharp decline in work-hours, more than what had been experienced by the larger firms. The decline in work-hours reached 14–17% compared to less-than 9% in larger firms (ILO, 2021). To the extent the average productivity is measured by the ratio of value-added over work-hours—or over the number of workers—that ratio went up significantly during the pandemic, giving a false impression that productivity had increased. The fact is, the higher ratio was driven mainly by a sharp decline in the denominator, not due to improvements in efficiency.

Enhancing MSME resilience to ensure growth and sustainability of their productivity is a huge challenge for social planners. It requires policy measures that could leverage the main drivers of MSME productivity at all levels, macro, meso, and micro.

The analysis in this book attempts to delve into the root causes of MSMEs' low productivity in Indonesia, taking into account the country's heterogeneity in several dimensions, for which the prevailing social capital cannot be ignored. By zeroing on productivity improvement as the main goal for MSMEs, the analysis is intended to answer the question "what are the key drivers for improvement in MSME productivity, and why were there gaps between what policies sought to achieve and what they actually accomplished." According to the analysis throughout the book, the answer to the first question is to create network(s) as a critical component of social capital, and to the second question it is because of a lack of serious efforts to listen carefully to MSMEs such that the design of many policies was not compatible with the prevailing social capital. Elaboration of those answers, how they are derived, and how to generate ranking of policies and identify the implementable ones take up the bulk of the book.

Social capital is the factor that we suggest policies ought to be compatible with. What is social capital? It is referred to as features of social organization. To the extent the interactions between communities and institutions in which social capital is part of could determine the prospects for development in a given society, social capital provides opportunities for mobilizing growth-enhancing resources (e.g., through social relations). It also implies that social capital does not exist in a political vacuum. Woolcock and Narayan (2000) argued that by incorporating different levels and dimensions of social capital, and recognizing its positive and negative outcomes (e.g., to promote or to undermine the public good), one could gather the empirical support to come up with comprehensive and coherent policy prescriptions.

Norms, trust, and networks that facilitate participation, coordination, and cooperation for mutual benefit are the main components of social capital (Six et al., 2015).

Social norms are actions regarded as either proper or improper by a particular community (e.g., a cluster of MSMEs). Manifested in rules, beliefs, mores, and habits, they regulate behavior, and are socially defined and enforced through social sanction. They therefore are essential to the functioning of the cluster, community, or society in general. As an important component of social capital, norms help create an enabling environment for MSME to improve productivity by way of encouraging prosocial actions from which cooperation for collective actions can be formed (Ostrom, 2007; 2010), and discouraging exploitation or other depraved practices.

Closely related to norms is trust. It reflects both an outcome and an antecedent of social capital, for it is built from—and also a basis for—relationship. That is, trust and norms have a two-way relation. Trust enables the free flow of information. And since all transactions rely on it, trust could also reduce transaction costs and lower the level of risk, both of which could stimulate more transactions. Its potential to reduce the transaction costs makes individuals invest in trust (e.g., to gain reputation).

The third component of social capital is network.¹ Network can be formed along many dimensions of community (a group of MSMEs) in which related members of

¹ In Chetty et al. (2023) social capital is classified into three types: connectedness (between different types of people); civic engagement, such as volunteering; and social cohesion, in which network is an important part of.

the community (stakeholders) interact—customers, suppliers, lenders, social planners, and other MSMEs. It can promote and strengthen the social capital by facilitating transfers of information and resources to improve productivity. This component of social capital is strongly emphasized by MSMEs in our survey as the primary driver for productivity improvements. Extensive networks of contacts can reduce the costs of searching (e.g., for markets, inputs, credit) and improve the flow of information (e.g., regarding opportunities, permits, new techniques, innovations, quality of clients), while narrowing the range in which moral hazard exists. Another line of reasoning could be made that networks allow members to use as supplementary activities to exploit monitoring devices not otherwise available, and to guard against market failure caused by asymmetric information. Although in general case social networks are not always built up for the economic value to members, the survey results in our previous study revealed that most MSMEs utilized the networks for business purposes; see Azis (2022), particularly the analysis of Fig. 4.4 (replicated in this book in Fig. 3.4).

Studies after studies have shown the wealth of evidence of pervasive and profound effects of social norms on the effectiveness of policies, because social norms influence the nature of human actions including reactions toward policies. We endorse this premise. The social capital should not be treated like other forms of capital because its existence does not reflect a deliberate sacrifice, and it is not transferable. There is also a risk of making overgeneralization if we see its function like that of other capital where some quantitative return can be derived from (e.g., the rate of return on social capital changed from x percent a year to y percent a year does not convey any clear picture). Instead, we see social capital as a preexisting social and institutional conditions to be analyzed in the context of organizational theory, i.e., as a social means of coping with moral hazard and incentive problems. Social capital can be understood through the rational choice theory, where improving performance requires finding and designing a better mechanism to change the incentives system that alters agents' behavior. All these imply that social capital can adapt, albeit partially and in an evolutionary way, to a new environment such as interpersonal networks being partially replaced with formal institutions.

In contrast to the effect on individual agent or MSME, however, social capital can be the cause of, rather than a corrective response to, market failure. They can be detrimental to the overall productivity. Social capital-driven collusion and self-interest behavior are notable examples. They can lead to a price increase due to production cut or stockpiling at the cost of society's interest. In some cases, the policy response to it could also make things worse when it favored politically connected agents in the name of restricting competition. Another example is with respect to group participation as part of social capital that could paradoxically result in higher social costs (costs incurred by society as a whole). It could occur when trust, despite its ability to stimulate broader elements of civic cooperation, does not correlate with group membership (Varshney, 2002), or when participation in one locality/group causes a "crowding out" effect by imposing external costs on other localities/groups as highlighted in Wade (1988) and Alatas et al. (2002).

In retrospect, our study considers social capital as features of social organization, such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit (Putnam, 1993; Ostrom and Ahn, 2003). Put in the context of the effects on performance, there is a close association between trust, norms, and network. When attempts are made to define how those components can be strengthened, however, disputes about the role of social capital arise. Using membership in formal groups as a measure of social capital, Putnam (1993) argued that horizontal networks reinforce trust and norms, and through that relation the social capital is strengthened and it eventually affects performance. Others, however, suggest that it is trust and cooperation rather than membership that affects performance. Membership is not associated with trust or with improved performance (Knack, 1992; Knack and Keefer, 1997).

What about institutions? How does social capital relate to institutions? Simply defined, institutions are systems of established social rules that structure social interactions, and social institutions form an element in social structure. Institutions in general and social institutions in particular are useful. They create stable expectations of society behavior, and can both constrain and enable behavior, e.g., existence of rules can open up possibilities and actions that otherwise would not exist.



Survey story: Traditional market in Wamena, Papua. Like many other traditional markets, it faces a certain degree of competition from a growing number of modern market stores that have better facilities and are able to offer lower prices, guaranteed product quality, shopping convenience, and choices of payment methods. However, since the goods sold in this type of traditional market are mostly produced by the traditional micro farmers, and they are different from goods sold in the modern market, there is some kind of market segmentation, where certain customers shop in modern market stores, but other segments of customers continue to go to this traditional market

By using the trust-driven cooperation (e.g., a bottom-up cluster), participation, and coordination as the examples of social capital, Azis (2022) argued that there is a

two-way relation between social capital and institutions. In governing the behavior and activities of agents, social capital is constrained by the prevailing institutions. The formation of social capital is sensitive to the political and social forces as a result of the prevailing institutional arrangement. On the other hand, institutions are shaped by history and social choice, implying that they are also influenced by social capital. Hence, there is a deep complementarity between institutions and social capital. Their nexus could transmit greater influence on performance.

In the context of our study, insofar institutions and social capital are shaped by the characteristics of the society, the interaction between policies, institutions, and social capital plays a crucial role for understanding the productivity performance of MSMEs. The interaction could determine how and why policies were responded by the community in such a way that their effectiveness became limited.

The use of the conceptual analysis presented here can be tested in any countries, but the specific findings from the journey reported in this book are based on the case of MSMEs in Indonesia, the overview of which is given next.

1.2 Overview of Indonesia's MSMEs

What is MSME? One may argue that finding the precise definition is not too important because what matters is designing policy intervention that will help small businesses to improve their performance. I disagree. That argument may sound reasonable and practical, but inconsistencies among several definitions of MSME can lead to serious distortions in policy intervention (e.g., targeting fund allocation). Finding consensual definitions is not only possible but also necessary to avoid some biases from overgeneralizing the category and coverage of MSMEs.

Various arguments about firm size classification have been made. It is generally suggested that the proper criterion to use is the firm's volume of turnover rather than the number of employees or the value of assets as commonly adopted in many countries. And when such a criterion is applied in different regions or localities, it needs to be adjusted by regional differences in the level of economic development (Gibson and van der Vaart, 2008).

What is the definition in Indonesia? Until recently, the official reference for classifying MSME was based on Law Number 20, 2008. The criteria rely on both the turnover and the asset size. More precisely: microbusinesses are those with assets below Rp 50 million and turnover below Rp 300 million; small businesses are those with Rp 50 million to Rp 300 million assets and a turnover of Rp 300 million to Rp 2.5 billion; and medium businesses have assets of Rp 500 million to Rp 10 billion and turnover of Rp 2.5 billion to Rp 50 billion. During the COVID pandemic, the parliament passed a controversial "Omnibus Law" (officially known as Law No. 11/2020 on Job Creation) with a massive 1187 pages that came into effect on November 2, 2020. One of the legal directives of that Law was the Government Regulation No. 7/2021, in which changes are made in the classification of MSME as follows: microbusinesses are those with maximum assets Rp 1 billion and sales of Rp 2 billion,

Table 1.1 Comparison of MSME classification criteria

Category	Net asset	
	2008	2021
Micro	≤Rp50 million	≤Rp1 billion
Small	Rp50–Rp500 million	Rp1–Rp5 billion
Medium	Rp500–Rp10 billion	Rp5–Rp10 billion
	Annual sales	
	2008	2021
Micro	≤Rp300 million	≤Rp2 billion
Small	Rp300 million–Rp2.5 billion	Rp2–Rp15 billion
Medium	Rp2.5–Rp50 billion	Rp15–Rp50 billion

small businesses are those with assets between Rp 1 billion and Rp 5 billion and sales between Rp 2 billion and Rp 15 billion, and medium businesses are those with assets over of Rp 5 billion but below Rp 10 billion and sales between Rp 15 billion and Rp 50 billion (see Table 1.1).

Even using the above references, data availability and consistency are problematic. Most microenterprises and some small enterprises in Indonesia operate in the informal sector. The proportion with formal registration for that category is generally lower than in other developing countries, and so is the incentive to become formal (longer years spent in the informal sector). The problem is, data sources did not clearly differentiate between formal and informal microenterprises. One estimate shows that the ratio between informal and formal MSMEs in Indonesia was about 22% (World Bank-IFC, 2017).

Virtually all of Indonesia's MSMEs have the status of sole proprietorships, and some are gathered in co-operatives. In the microenterprise category, less than a quarter are run or owned by woman, and in the small and medium categories the female proportion is even lower (less than 17%). Majority of MSME have a lower propensity to export than larger firms, although part of their output may be exported indirectly through subcontracting arrangements. The recorded contribution of MSMEs in Indonesia's total exports was only 15.65% (2019 data), barely improved from the previous years. For 2024, the government set a target of 17%, which is still much lower than in other neighboring countries (60%, 41%, and 29% in China, Singapore, and Thailand, respectively). In general, MSMEs represent a significant part of the country's economy especially in terms of their share in business units, output, and labor absorption. The information on output varies according to the sources. The latest available data from the Ministry of Cooperatives and SMEs show that the contribution of MSME in Indonesia's GDP in 2019 was about 54.2%. But according to the Coordinating Ministry of Economic Affairs, the post-COVID number already reached 61%. The same predicament applies to data on the number of unit. According to the Coordinating Ministry for Economic Affairs (Press Release in 2022), there were 64.2 million MSME, far higher than the data from the *National Survey of Labor Force* (SAKERNAS), i.e., 50.6 millions. Although the COVID pandemic accelerated

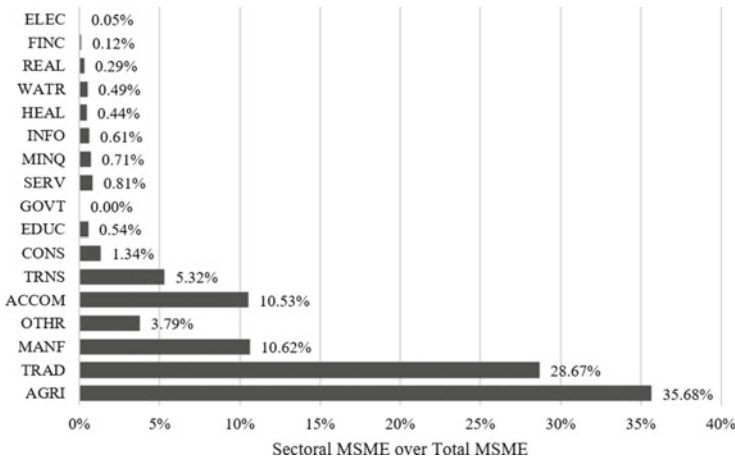


Fig. 1.1 Share of MSME unit, 2021 Source SAKERNAS, own calculation

the growth of MSME unit, such a difference is hard to reconcile. The sectors in which most MSMEs operate are: Agriculture, Trade, Manufacturing, and Accommodation (Fig. 1.1), and one estimate indicates that women own about 65% of the total MSMEs. Around 54% of MSMEs operate in Jawa, and urban location slightly dominates the distribution country wide. This translates into a density of 185 unit per-1000 population in average, which is high by international standard. The inequality between regions is also evident: 178 in Jawa and 195 in non-Jawa. When we look at the distribution by provinces, the inequality is even starker. The highest density is recorded in East Nusa Tenggara (242.7), and the lowest is in Jakarta (143). All the above are based on 2021 data. Prior to 2020, most MSMEs operated in the agricultural sector, but since the pandemic the service sector took over the dominance.

On labor absorption, it is often argued that MSME is more labor intensive than larger firms. Although it is true that MSMEs absorb a large number of employees, it is misleading to use enterprise scale as a reliable guide to identify the labor intensity of MSMEs. Many MSMEs are in fact more capital intensive than larger firms in the same industry. By implication, policies designed to help them should not be confused with targeting employment creation.

How large is the MSME labor absorption in Indonesia? According to SAKERNAS data, some 67.5 million Indonesians (more than half or 56% of total employment) work in MSME. The COVID pandemic not only raised the number but also changed the distribution between large and small enterprises. After the shock, the employment share declined in the former (through labor shedding and/or bankruptcy) and increased in the latter. Such a shift was accompanied by changes in the regional and sectoral distribution too. Prior to COVID, there were more MSME employees in non-Jawa than in Jawa, and the reverse occurred after COVID. Most of the added MSMEs after the pandemic apparently happened in Jawa, where the economic hardship forced many in this most populated island to open small businesses. Before

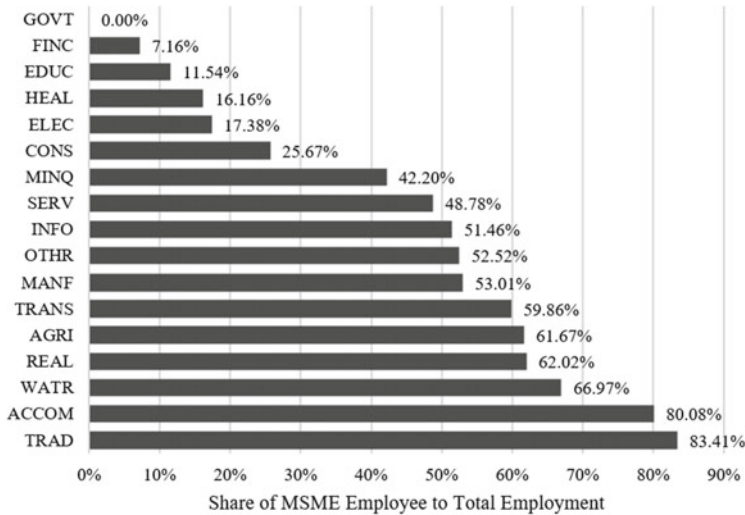


Fig. 1.2 Share of MSME employment, 2021 *Source* SAKERNAS, own calculation

2020, the MSME sector that employed the largest number of workers was in the agriculture, and after COVID the highest number was in services. It is important to note, however, that by sub-sector, the largest number was in trade, part of the services sector (Fig. 1.2). Many of these businesses were involved in small retail activities with low productivity.

A lack of access to finance is another important characteristic of MSMEs. It is a perennial topic for social planners, and is frequently identified as a critical barrier for growth. Like in many developing countries, MSMEs in Indonesia are credit constrained, facing a substantial financing gap. Credit rationing, more than demand, hampers the growth of loans. Policy measures to relieve the constraint were often ineffective as most of them failed to address the prevailing social capital and other on-the-ground challenges faced by the MSMEs.

Figure 1.3 shows that the gap between credits allocated to MSMEs and total credits has been widening, where the ratio of the former to the latter is hovering around 20%. Even with the falling BI’s policy rate and a series of government’s efforts to support MSMEs during the COVID pandemic, the gap continued to widen in 2022. That figure conceals the skewed distribution of lenders. About 65% of all credits to MSMEs were issued by only four biggest banks in the country (Bank Rakyat Indonesia or BRI, Bank Negara Indonesia or BNI, Bank Mandiri, and Bank Central Asia or BCA), and only two of them (BRI and BNI) allocated more than 20% of their credits to MSMEs. Compared to the case in most countries around the world, measured as a percentage of GDP the total credits for MSMEs in Indonesia have been among the lowest (less than 7%), while the density of MSMEs is among the highest.

The credit allocation by sector shows that trade has been always the largest recipient. For most people who wish to start doing business or selling something, it is easier

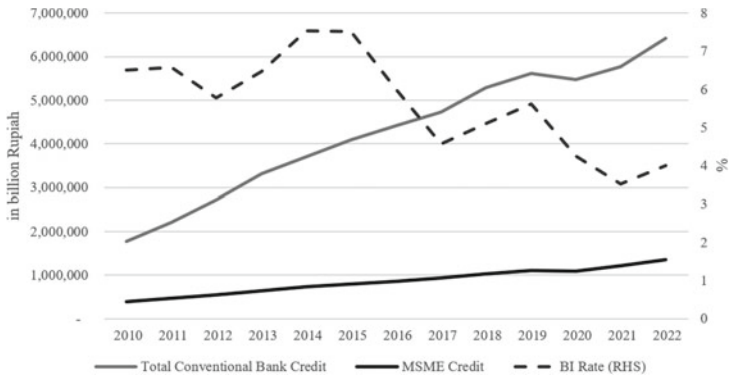


Fig. 1.3 Gap of total and MSME credit *Source* Department of MSME Development and Consumer Protection, Bank Indonesia

to establish small retail trade than manufacturing activities at the beginning. Some may be able to expand the business or switch to manufacture something, others may fail and close the business altogether, and many stay in the same retail trade business. The first and the last categories have better access to bank credit. Getting credit approval is easier as banks' propensity to lend to them is larger than the propensity to lend to newcomers who do not have credit record or sufficient collateral. Yet, even though the required size of credit is small, the number of retail trade MSME across the country is huge, that the overall sum of bank's credit allocated to retail trade sector is

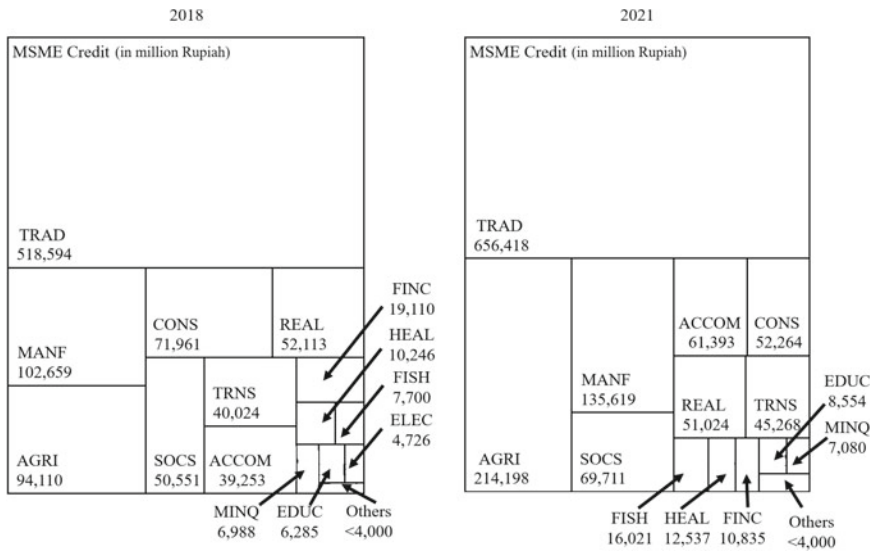


Fig. 1.4 Sectoral MSME credit allocation, 2018 and 2021 *Source* Department of MSME Development and Consumer Protection, Bank Indonesia

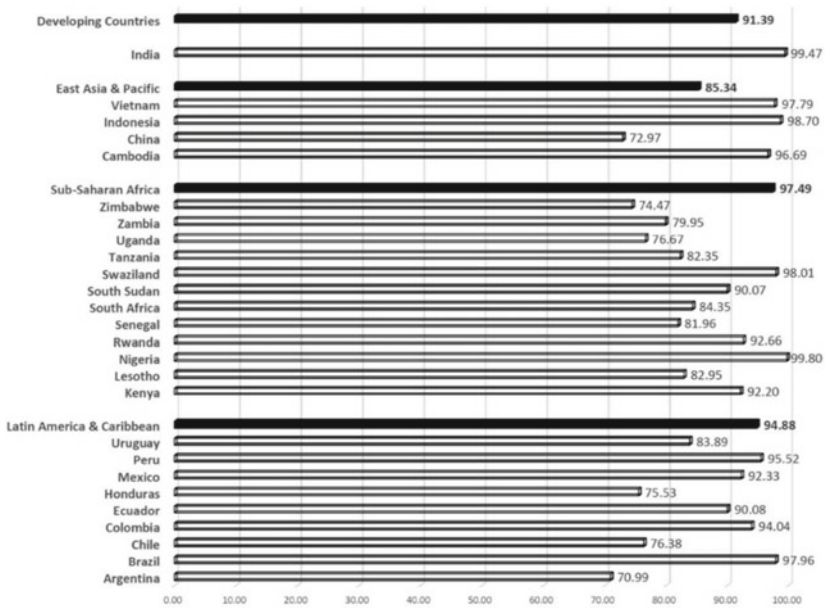


Fig. 1.5 Percentage share of microenterprises in total MSMEs in selected countries *Source* SME Finance Forum (2017). *MSME Finance Gap 2017*, WB-IFC, Washington DC

the largest, close to 7% of all MSME credit (Fig. 1.4). The COVID pandemic seemed to cause a structural change in terms of a relative decline in manufacturing activities (lockdowns and other restrictions) and an increase of agricultural sector (may have been related to an increase in the health conscious behavior). Such a change is also reflected in the credit allocation before COVID and 2 years after COVID.

Another important feature of MSMEs in Indonesia is the dominance of microenterprises in total MSME unit. While in many countries the share of small and medium enterprises is typically lower than that of the microenterprises, the proportion of the latter in Indonesia is far higher than the average in developing countries (see Fig. 1.5). Based on the IFC data taken from the Ministry of Planning 2017, almost 99% of total MSMEs in Indonesia are of the microtype. This number is higher than the average in Asia Pacific countries (85.3%), the average in Sub-Saharan African countries (97.5%), and the average of Latin America and Caribbean countries (94.9%). Hence, to get a better and truer picture about the problems and challenges of the country’s MSMEs and the appropriate policies to improve their performance, it is necessary to cover a disproportionately larger share of microenterprises in the study. It is for this reason more than 80% of our survey respondents were of the microtype.

In short, Indonesia’s MSMEs are large in number and dominated by microenterprises, having low productivity, and credit constrained. Efforts to enhance their productivity thus far have not been effective. Policies to relieve their credit constraint may require a different approach than what had been taken. Whether it is to use mov-

able collateral registries to cover the perceived risks of lending, or to apply other alternatives to traditional collateral-based lending such as supply chain finance, or to pair financial support with advisory services, a good network between MSMEs and the stakeholders is required to make such alternatives possible.

1.3 Book's Outline

We begin our journey in Chap. 2, where we identify and rank the list of social capital-compatible policies and policy-mix from the perspective of our respondents. Applying the *Analytic Hierarchy Process (AHP)* and *Analytic Network Process (ANP)* techniques as we did in our previous study, the analysis in Chap. 2 is attempted to test whether the results continue to reveal the dominance of social capital. By capturing more detailed interrelations between objectives, criteria and alternatives with some feedback effects, and also by identifying the policy-mix, however, in the current study, we are able to specify which among social capital components that is most effective for productivity improvements.



Survey story: Women-run cooperative in Aceh, selling handicrafts produced by women villagers. Having limited network at early stage, they struggled to find market, and were unable to improve their productivity. By forming groups or clusters, and developing a network with other institutions (with the help of the local BI office), the sales increased and the skill of the members improved

To the extent not all policies preferred by one group are in line with those of others, hence they are not implementable from the social welfare perspective, attempts are made to scrutinize the derived social capital compatible policies in Chaps. 3 and 4. We adopt a novel approach to dissect the preferred policies into non-implementable

and implementable ones, and derive the mechanism (endogenously) to implement the latter. The approach is to combine the eigenvector-based ranking—derived from the AHP and the ANP—with the application of monotonicity test based on the *mechanism design theory* (MDT).

In Chap. 6, we verify the results by using hybrid data (combined interviews and secondary data) applied to the instrumental variable regression. We used a set of control variables, including the non-economic type, and we assign a culture-related variable, i.e., the presence of indigenous communities or *masyarakat adat*, as the instrument. The analysis is intended to test the significance of the component of social capital derived from the perception survey reported in Chaps. 2–4, and challenge the conventional wisdom that size is the key determinant for productivity improvements (larger firms tend to have higher productivity).

Among several control variables, two are highly relevant for the analysis of MSME growth and productivity: financing and digitalization. To the extent these two are among the top agenda of social planners in Indonesia, issues surrounding them are discussed in Chap. 5. For the financing part, the extent of Indonesia's MSMEs being credit constrained is shown, followed by the discussion on the results of a disequilibrium model where the presence of credit rationing and high transaction costs is substantiated. On digitalization, the opportunities and challenges for MSMEs to use digital technology are analyzed. Using the trend since the COVID pandemic, our interest is to find out whether the increased use of digital technology since the pandemic is cyclical or structural. And our journey and findings are summarized in Chap. 7.

Let us begin the journey.

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Chapter 2

Compatibility of Policies and Social Capital



In our previous study (Azis, 2022), the role of the interplay between public policies and social capital (SC) was clearly revealed to be very significant for MSME productivity. The majority of MSMEs perceived the contribution of social capital was either the same or greater than government policies in affecting productivity. Any policies would have been more effective if they were consistent and compatible with the prevailing social capital. In particular, the two factors that reflect the social capital, i.e., participation and coordination, were considered by MSMEs as most important for achieving real improvements in their performance. If the set of policies (on linkages, structural, and technology) were put in the context of supporting the participation and coordination, they would have produced a profound impact on MSME productivity. Policies on linkages, more specifically those intended to create and strengthen interactions among MSMEs and with other stakeholders, were considered most crucial, followed by access to affordable financing. Some medium enterprises (MEs), particularly those involved in exports and had received supports and guidance from BI, were of the opinion that improving infrastructure including in digital technology would help enhance their productivity through information searching and increasing market share. It was also revealed during the discussions that simplifying rules and regulations and ensuring legal certainty could help streamline their business and reduce transaction costs. In turn, they would improve their efficiency.

On the social capital front, the importance of participation and coordination, especially for seeking knowledge and information, was ranked the highest, which also implies the imperative of having effective linkages among themselves and with others. In short, the key message of that study is to avoid making policies not compatible with the prevailing MSMEs' social capital.

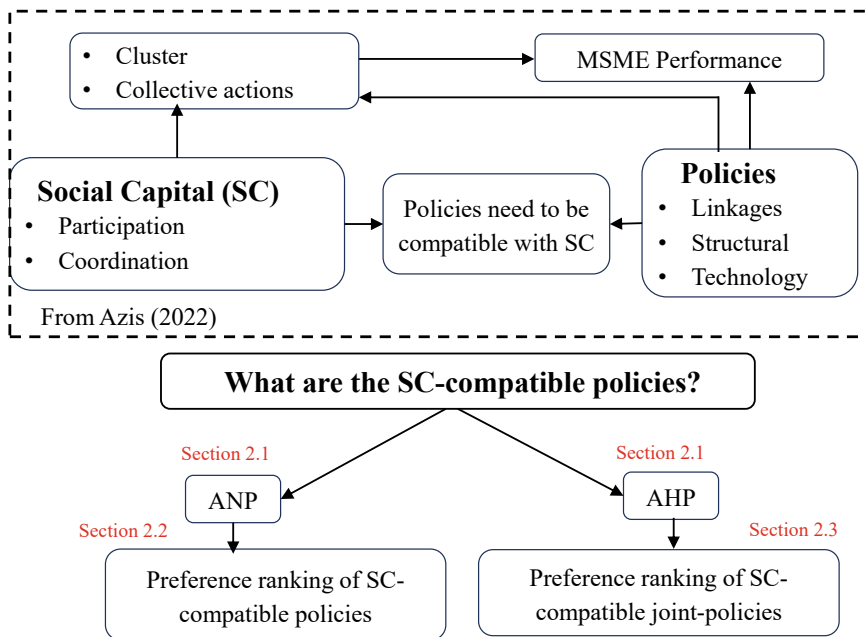


Fig. 2.1 Organization of this chapter

In the current study, we take a further step by focusing on the following questions: What are the social capital-compatible policies that can be implemented, in the sense that those policies will align the MSMEs’ preferences with the desired goals? Is there a mechanism that could be designed to implement those policies? This chapter focuses on the first question. The second is taken up in the next chapter. For both purposes, we construct a framework of analysis utilizing MSME perceptions where the resulting preference ranking is derived and used to identify the implementable policies. We also discuss some issues surrounding the mechanism to implement them.

Figure 2.1 shows the organization of this chapter. Based on the finding of our previous study (Azis, 2022) recapped in the upper box, our key question here is: What are the social capital-compatible (hereafter SC-compatible) policies perceived by MSMEs as the most important for improving their performance and productivity (Sect. 2.2). The expected result of the analysis is therefore a preference ranking of SC-compatible policies. In Sect. 2.3, a similar question is raised for joint policies: What are the SC-compatible joint policies most preferred by MSMEs? Before we try to answer those questions and show the analysis and the results, in the next section, we first describe the approach we used in the analysis, i.e., the Analytic Hierarchy Process (AHP) and the Analytic Network Process (ANP).

2.1 Methodology: Analytic Hierarchy Process (AHP) and Analytic Network Process (ANP)

It is well known that there are three logic-based approaches to understand and explain real phenomena on the ground and how human perceive those phenomena. First is the probabilistic approach in which a random process is utilized by taking the average and standard deviations of particular occurrences; second is the reductionist approach which is essentially using the cause and effect such as done in most impact studies; and third is the systems approach in which the interactions between parts within a system as well as the interactions of the system with its environment are central in the analysis. The *Analytic Hierarchy Process (AHP)* and the *Analytic Network Process (ANP)* fall under this latter category in which we look at the overall purposes (goals) governing the design and functions of a system to explain how and why it performs in a certain way. The fulfillment of the goals and objectives is the primary concern, based upon which prioritization or ranking in the fulfillment process becomes essential. The representation of the system itself takes on either a hierarchical or a network form consisting of the relevant objectives, criteria, constraints, and alternatives.

The starting point is to acknowledge that when applied to MSMEs with different “structural variables” or characteristics, the same policies can produce different outcomes (Ostrom, 2010). In the current study, the included structural variables are: location, type of activities, use of digital technology, level of supervision, financing status, gender, health conditions, and educational background of the owners and workers, etc. The outcome of implementing certain types of policy under those different structural variables depends on the identifiable environment and circumstances. They should therefore be evaluated on a case-by-case basis. This highlights the importance of acquiring firsthand information at different times, locations, and under different environments/settings. We did exactly that. We conducted a series of hybrid surveys—a mix of written, telephone, and online-based surveys to acquire firsthand information and perceptions of MSMEs.

The acquired information and the list of preferences were subsequently processed by using the AHP for the hierarchy based, and the ANP for the network-based questionnaire, from which we explored and identified the alternative policy measures and policy-mix.

The first step in AHP and ANP is to establish the relevant hierarchy and network, respectively, before comparing the objectives with each other to find the importance of each objective over the other (the weight represents the degree of importance). We do similar comparisons for the criteria based on each objective, and for the alternatives based on each criteria. The following are examples of a simple hierarchy, a simple network, and a more complex network. It should be noted that the number of levels in a hierarchy and a network, as well as the number of element in each level, can vary depending on the scope of the issue at hand. Note also that the type of arrows distinguishes the hierarchy in Fig. 2.2 (one-way arrows) and the simple network in Fig. 2.3 (two-way arrows).



Survey story: Clay pottery products made by members of a woman cooperative in the village of 'Banyu Mulek' located in outside Lombok, West Nusa Tenggara. The saving-and-loan cooperative was set up to help women in the village to earn money by doing small business, mainly producing clay-pottery, and allow them to borrow money at a level of interest rate agreed by members. After paying a small fee to join the cooperative, members put a voluntary saving account. During years of operation, the cooperative was able to improve the livelihood of members and the village community in general, without any loans from banks or other parties. It was the strong social capital among members that played an important role in its success. Trust among members and the tightly-kept community norms were reflected in the effective social sanctions, making the cooperative's non-performing loan negligible

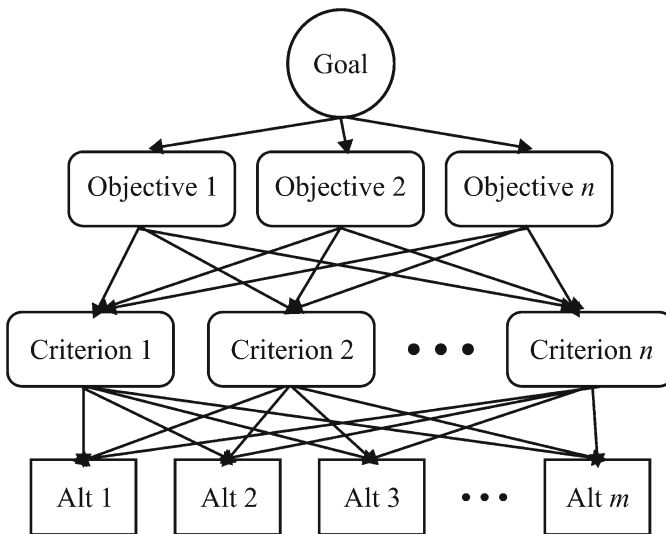


Fig. 2.2 A hierarchy in AHP

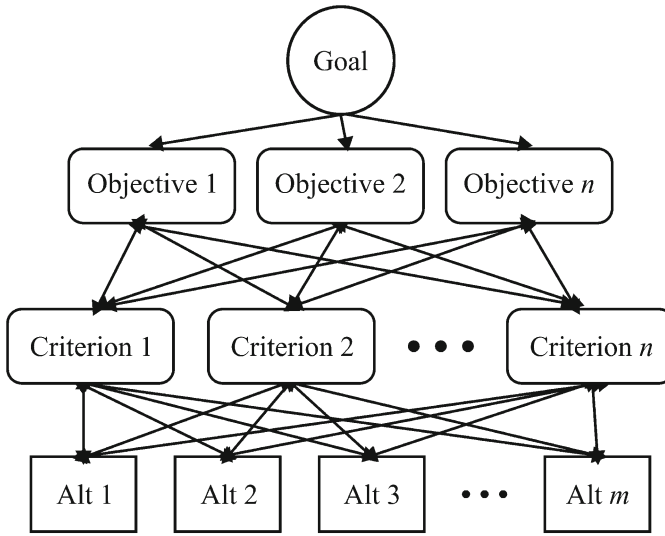


Fig. 2.3 A simple network in ANP

It is the way to generate the weights that distinguish AHP and ANP from the other system approach models. In particular, the procedure is aimed at yielding neither cardinal nor ordinal scales, but ratio scales which can be derived from pairwise comparisons (comparing two elements in a pairwise way) such that we can include intangible elements in the system. Using ratio scales is necessitated by the condition we wish to meet, namely, to enable us to perform all of the arithmetic calculations (addition, subtraction, division, and multiplication).

In AHP, the weights of the criteria are multiplied by the weights of the alternatives for those criteria to find the overall weights or priority ranking. In ANP, however, the process to generate the overall weights is by forming the so-called supermatrix that is raised to large powers (after making the matrix stochastic) to reach a converging point where the largest eigenvalue equals to one. Brief technical explanations and the mathematics of AHP and ANP are shown in Appendices B and C.

Two sets of questionnaire were used: one that includes policies and social capital to capture their interplay, and another that includes a set of policy-mix. The latter is important because the effectiveness of one policy is often influenced by the effect of another policy. In both sets, the policies and policy-mix were constructed based on what MSMEs perceived as being consistent with the conditions they believed reflecting their social capital. Hence, these measures are essentially SC-compatible policies. The first set involves a network, where some components are affecting—and be affected by—other components, and the second set uses a hierarchy in which the objectives, broad challenges, and more specific problems faced by MSMEs are ranked before making the priorities of policy-mix. In constructing the networks and hierarchies, we conducted a series of preliminary discussions with the prospective

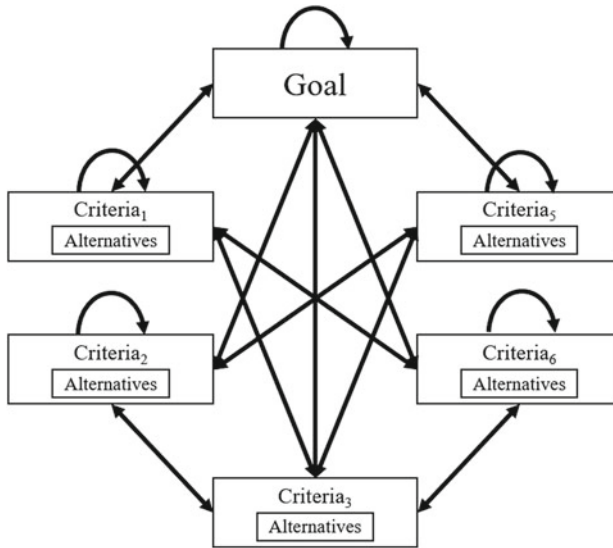


Fig. 2.4 A more complex network in ANP

respondents to capture their perspectives with respect to the relevant components, the nature of the goals, objectives, and the consequences of the selected components on productivity.

2.2 Interplay of Policies and Social Capital

The main task of getting firsthand information through surveys is to generate policies that are compatible with social capital. For that purpose, we first constructed a questionnaire based on a network system where some levels and components in the system interact with each other. As displayed at the bottom of the network in Fig. 2.5, the first two components represent what MSMEs think necessary to get the information and support for the business, for which participation and coordination (in a cluster) are required, hence need to be facilitated. In turn, the acts of participation and coordination require the presence of two important elements of social capital, trust and norms. Both participation and coordination are essential to make a network, another element of social capital, more effective and useful for improvements of MSMEs' performance. The high importance assigned by MSMEs to participation and coordination for information searching and business purposes indicates their preference to have some sort of linkages among themselves, for example, through a cluster for networking. We arrived at those SC-compatible measures based on the results from our earlier study as well as inputs from the pre-survey discussions with MSMEs and other relevant parties.

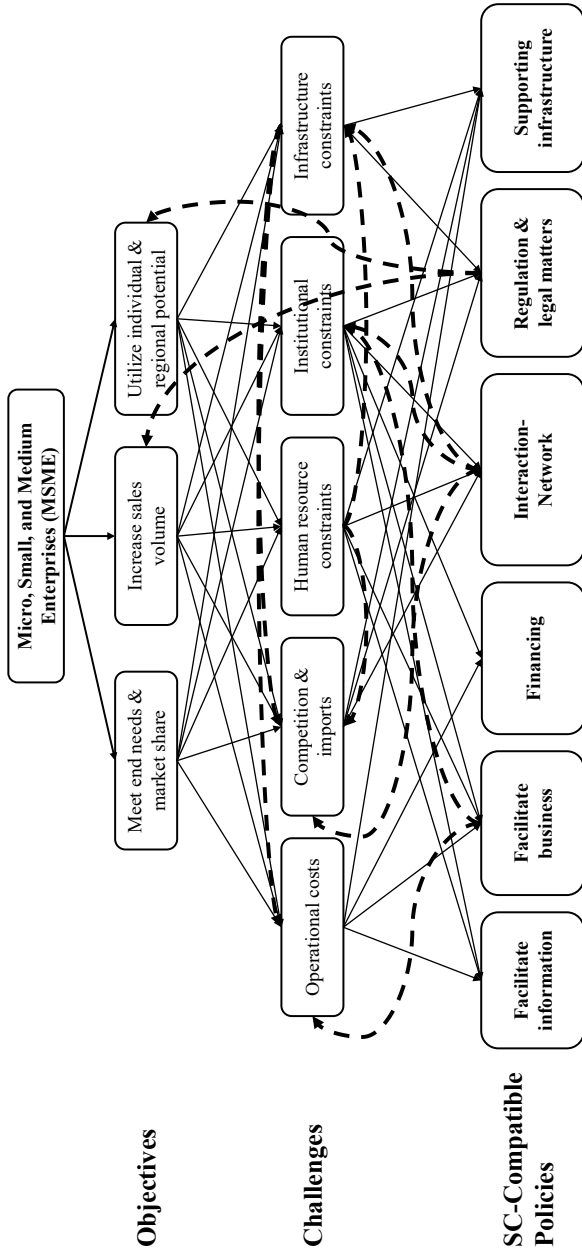


Fig. 2.5 Network structure for MSME

Other components shown at the bottom of the network are the set of policy measures. The first policy compatible with the social capital is on financing, particularly access to affordable funding to enable MSMEs to get involved and be active in a cluster or a network. Another SC-compatible measure is to simplify regulations and ensure legal certainty including legal supports for MSMEs. Simplifying regulations will free up MSMEs to focus on their actual operations without the need for additional subsidies or tax breaks. All these measures need infrastructure supports, hard and soft, to make the interaction and networking effective. For example, the availability of electricity and Internet access is inevitable for establishing an effective network. Another supporting infrastructure (the soft type) is to provide training and guidance to use web browsers and other Internet applications for communication. These measures are necessary for getting the maximum benefits from interactions.

But choices and preferences do not exist in a vacuum; they are predicated not on an ideal or normative world but on the world as it is. What governs them and drives their attainments are the objectives and challenges that MSMEs must face in their day-to-day activities.

To accomplish any objectives, one needs to know how to set them, not just state “what I want” and expect them to happen. Objective setting is a process that starts with a careful consideration of what MSMEs want to achieve, and ends with SC-compatible measures that social planners are expected to take. In the process, MSMEs consider what necessary actions they would take to make those policies work. In between objectives and policy measures, some well-defined challenges are identified. They transcend the specifics of each objective and provide implicit guides on what steps to take. Only after considering these challenges and the necessary steps can the objectives to be accomplished be formulated.

The three objectives displayed in Fig. 2.5 reflect that consideration, i.e., to meet the end needs and expand market share, to increase sales volume, and to utilize individual and local potentials. One of the common mistakes made in many studies on SMEs is to overlook the different characteristics of different sectors and sizes, even within the categories of micro and small enterprises (MSEs) and medium enterprises (MEs). Some of our respondents are very small scale, more properly classified as micro with a sole proprietor and fewer than three employees including members of their own family. For many of them, the activities they are doing are largely intended to meet the end needs, or earn incomes just to survive. For example, there are quite a number of cases in the outer islands where residents undertake fishing in wetlands, rivers, and seas, to earn their livelihood by consuming their fish catch for themselves or selling it in the traditional markets. Many poor fishermen have to rely on the patronage of boat owners and middlemen. Other microenterprises that produce foods, other agricultural products, or handicrafts earn enough money just to pay for the things they need to live, while others earn a little better than subsistence income.

For the more fortunate micro and small scale enterprises and the larger units, having an increased market share could be a stronger driver. Such an objective is at the same time supportive to meeting the end needs. In order to gain a higher profit margin, they need to increase their market share. This is especially the case for those selling products purchased infrequently by a fragmented customer group. Market

share is also closely related to return on investment, as a bigger market share reflects economies of scale and efficiency. MSMEs that actively use e-commerce are a notable example, in which the “experience curve” is at work. But a more frequent and simpler explanation for the market share-profitability relationship that we observed from numerous interviews was with respect to maintaining existing customers and finding new ones, and improving the quality of management particularly in controlling costs and making workers to be more productive.

The second objective, raising sales volume, is closely related to productivity. To the extent sales increase in monetary value can be due to rising price or increased volume, and the channel of social capital affecting productivity can lead to either a positive outcome (e.g., increasing output through collective action) or a negative outcome (e.g., lowering output due to collusion), the more relevant one for productivity is the increase in sales volume.

The third objective reflects closely the element of social capital. It represents respondents’ intention to make personal changes of attitude by utilizing their potential and capacity as well as local opportunities through collective actions. In some cases, our respondents indicated their deliberate desire to serve as initiator, facilitator, or mentor to help the community do something useful for themselves, the surrounding areas and the community at large. Indeed, we found a number of micro and small enterprises (MSEs) and medium enterprises (MEs) in some regions whose activities were driven by concerns over the poor conditions of the community and wish to make improvements. Such activities are usually initiated and run by social entrepreneurs willing to empower others to solve their own challenges. Some of them are capable of catalyzing the potentials and bringing value to the fight against poverty and other social ills that the existing players and government programs are not. The overall results indicate that for both categories, ME and MSE, this third objective is ranked the highest, at 0.512 and 0.522, followed by the objective to increase sales volume, at 0.488 and 0.478, respectively.

Next are the challenges. These components act as the constrains MSMEs must face in their attempts to achieve the above objectives. The list of challenges in Fig. 2.5 is selected based on the findings of our previous study, particularly with respect to the components under “transaction costs” and “operating costs” in the benefit/cost framework. The operation costs include spending for inputs and raw materials, costs of capital (including bank loans), and labor costs. The latter are related to the quality of human resource and labor productivity that influence MSMEs’ ability to compete with domestically produced and imported goods of similar products. The effect on the latter is indicated by an arrow emanating from “human resource constrains” pointing to “competition & imports.” Constraints on human resource quality also have some effects on the effectiveness of using the supporting infrastructure, e.g., computers for accounting and reporting, the Internet for marketing, payment system, and information searching. Note that the supporting infrastructure in this case includes soft infrastructure as many MSMEs especially those run by older individuals with low Internet literacy encounter significant challenges to utilize online activities even when a relatively good Internet facility is available. They face a predicament of being largely disconnected from the world of digital tools and services, both

physically and psychologically. This condition is depicted by the arrow connecting “Human resource constrains” and “Infrastructure constraints” in the network. A less-than-capacity usage of infrastructure could also prevent MSME to have lower operating costs and to compete with other products; hence, there are arrows connecting “Infrastructure constraints” with “Operational costs” and “Competition & imports.”

By incorporating all the interactions and feedback effects, overall results show that the most important challenges for our MSME respondents are the “Operational costs” (0.285) followed by “Competition & imports” (0.268) and “Institutional constrains” (0.233). Breaking down the respondents into MSE and ME, the ranking for ME is slightly different. Since some of their products have to compete with other products including from imports, they ranked “Competition & imports” slightly higher than “Operational costs” (0.267 versus 0.260).

Unarguably, the above complex interactions of challenges influence the preferences of MSMEs’ SC-compatible measures (bottom part of Fig. 2.5). However, in a network system the priority ranking of challenges could also be altered by the preference ranking of policy measures. That is, the feedback effects are at work. Consider the case of “operational costs.” For some MSMEs, especially those located in remote areas, this component may be the most binding of all challenges. Therefore, it is ranked the highest. But if efforts to facilitate participation and coordination for business purposes are not highly prioritized for these MSMEs, instead, they consider networking with other stakeholders (“interaction-network”) and having legal certainty and protection (“regulation & legal matters”) to be more relevant for productivity improvements, then the “Operational costs” may not be ranked high. This mechanism is captured by the arrow originating in “Facilitate business” pointing to “Operational costs.” A similar argument can be made for “Institutional constraints” in the list of challenges.

Another important point to note is that, choices of policy measures could also have some feedback effects that evoke different ranking of objectives. In particular, measures to simplify regulations and provide legal certainty to MSMEs could be so critical that they may be able to sway the importance of MSMEs’ different objectives. The arrows connecting “Regulation & legal matters” to “Increase sales volume” and “Utilize individual & regional potential” capture the mechanism of such influence. We learned that quite a number of respondents complained about the complexity of acquiring certain permits related to their business operations. Some were also concerned with the sporadic and unannounced inspections on certain matters requiring compliance which often ended up with bribing the inspectors. Since regulatory agencies are usually unable to conduct continuous inspections due to resource or technological constraints, they tend to choose sporadic and unannounced inspections. Although such a practice can be more effective in catching the violators off-guard, it could seriously disrupt MSMEs’ daily operations, not to mention create fears among them. This has the potential to cause severe financial difficulties and bring some into bankruptcy. Ironically, such an episode often occurs during an economic hard time, when many MSMEs are facing financial difficulties. As a result, the objectives of improving productivity and utilizing individual potential, let alone initiative to develop the community and boost the local economy are no longer on the

priority list. Under such circumstances, survival becomes the overwhelming purpose of running the business (instead, “Meet the end needs” receive a higher weight).

The point is, in stating their preferences toward SC-compatible policies, the MSMEs went through a series of questions related to alternatives, challenges, and objectives. The interrelations among those factors are complex and include some feedback effects, such that there is a possibility that the ultimate policy ranking could have been different had they been asked to rank the preferred policies directly without considering those complex interrelations. At this juncture, it is worth associating MSMEs’ response with the concept of “fast thinking” and “slow thinking” proposed by Kahneman (2011). In “slow thinking” (also labeled System 2), either consciously or unconsciously MSMEs incorporated the complex patterns of ideas and association involved in the questionnaire. To reveal their preferences, they proceeded through a sequence of steps using their cognitive program through an orderly process. This process is very different from revealing the preferences in a more automatic and direct manner (“fast thinking” or System 1) without considering objectives, challenges, or anything else. Under this system, their quick impressions and feelings are the main sources of their deliberate choices, based upon which they reveal the ranking of policies. The different results of using System 1 and System 2 are shown and discussed in the next chapter, particularly in Sect. 3.2.

Once the weight of each component is measured and included in the network, and the relevant method to find an equilibrium is applied, the final outcome of SC-compatible policies would be more consistent with the existing objectives and challenges. As shown in Table 2.1, of all six measures, the highest rank is “Interaction-network” (0.232) followed by “Supporting infrastructure” (0.195) and “Regulation & legal matters” (0.171). Broken down by MSE and ME, the ranking remains the same for both.

Table 2.1 Summarized ranking of policy preferences of ME, MSE, and MSME (ANP)

		MEs	MSEs	MSMEs
Alternatives	Facilitate information	0.155	0.138	0.144
	Facilitate business	0.14	0.161	0.151
	Financing	0.093	0.115	0.106
	Interaction-network	0.239	0.228	0.232
	Regulation & legal matters	0.185	0.163	0.171
	Supporting infrastructure	0.187	0.196	0.195
Challenges	Operational costs	0.26	0.301	0.285
	Competition & imports	0.267	0.266	0.268
	Human resource constraints	0.058	0.052	0.055
	Institutional constraint	0.258	0.222	0.233
	Infrastructure constraint	0.158	0.159	0.160
Objectives	Meets end needs & market share	0	0	0.000
	Improve productivity	0.478	0.488	0.482
	Catalyze community & individual potential	0.522	0.512	0.518
Observations		40	69	109

The importance of networking cannot be overstated. Our field observations and series of interviews also found such a ranking was quite overwhelming.¹ Evidence from the global experience is also supportive to the primacy of networking. Many studies have shown that interaction, relationship, or network play an important role in market exchange; see, for example, Greif (1994), Kranton (1996), Knack and Keefer (1997), Barr (1988), and Fafchamps and Minten (2002). Compared to other variables including human capital (e.g., years of schooling, school density), networking as part of social capital has a much stronger positive effect on productivity. Through interactions in a network, MSMEs are able to deal with each other and with stakeholders in a more trustworthy manner, be it in sharing information, economizing production, marketing, borrowing and financing, or utilizing digital technology, such that the transaction costs can be lowered.

The probability of bringing innovation into MSME operations is also higher if a network involving the right players works through inter-firm cooperation. A study using the case of MSMEs in China shows that there is a strong positive impact of network on the innovation performance of MSMEs, albeit with different degree depending on whom the relation and cooperation are made with. The most significant positive impact is when the cooperation through the network is with customers, suppliers, and other firms including other MSMEs. The impact is stronger than the horizontal cooperation with research institutions including universities, and government agencies (Zeng et al., 2010). The role of social capital in strengthening innovation and its dissemination and absorption is as important as direct investments in knowledge and hardware infrastructure (Fountain, 1998).

But in many cases, the social planners and policymakers may have different perspectives. They tend to think that most problems faced by MSMEs are due to a lack of financing. Having a different mental bandwidth than MSMEs', therefore, they are more inclined to "solve" MSME problems by providing funds through various programs, regardless of the prevailing conditions and social capital around which the MSME operates. The ranking of policy preferences for MEs, MSEs, and MSMEs according to social planners is displayed in Table 2.2. Clearly, for the social planners providing financial support is considered the most important policy to help MSMEs solve their problems. The same applies for MSEs. Reconciling the differences of preferences of MSMEs and social planners is therefore imperative. This issue is discussed in detail in the next chapter.

The consistency of survey results from applying the ANP for the interplay of policies and social capital is summarized in Table 2.3. In all cases, the inconsistency index is less than 0.10. Similarly, the consistency results from applying the AHP for the policy-mix are shown in Table 2.4, from the ANP for Social Planner-MSME in Table 2.5, and from the AHP for Social Planner-MSME in Table 2.6. In all cases, none of the inconsistency index is greater than 0.10 (see Appendix B for the measurement of inconsistency index).

¹ Note that although the respondents are broken down into ME and MSE, we used the same network shown in Fig. 2.5 in developing the questionnaire. The ranking under the "MSMEs" column in Table 2.1 is derived from the geometric mean of the ranking for both, ME and MSE.

Table 2.2 Summarized ranking of policy preferences of Social Planner-ME, Social Planner-MSE, and Social Planner-MSME

		MEs	MSEs	MSMEs
Alternatives	Facilitate information	0.102	0.128	0.090
	Facilitate business	0.153	0.145	0.109
	Financing	0.228	0.289	0.303
	Interaction-network	0.274	0.221	0.251
	Regulation & legal matters	0.047	0.049	0.044
	Supporting infrastructure	0.195	0.168	0.203
Challenges	Financial capacity	0.433	0.445	0.443
	Institutional capacity	0.501	0.547	0.528
	Data on MSMEs	0.066	0.009	0.029
Objectives	Job creation	0.000	0.500	0.500
	Reliance on MSMEs	0.857	0.500	0.500
	Inclusive growth & competitiveness	0.143	0.000	0.000

Table 2.3 Inconsistency index, ANP representative sample

		MEs	MSEs	MSMEs
Objectives	Meet end needs & market share	0.044	0.088	0.053
	Improve productivity	0.078	0.066	0.043
	Catalyze community & regional potential	0.030	0.071	0.043
Challenges	Operational cost	0.078	0.093	0.045
	Competition & imports	0.058	0.070	0.069
	Human resource constraints	0.000	0.000	0.000
	Institutional constraints	0.000	0.045	0.069
	Infrastructure constraints	0.000	0.000	0.052
Alternatives	Facilitate business	0.000	0.000	0.000
	Interaction-network	0.000	0.000	0.052
	Regulation and legal matters	0.000	0.000	0.000

Notes $CI = 0$ indicates perfect consistency where maximum eigenvalue is equal to n , the number of independent rows

As indicated earlier, in this study we used several structural variables. For each of those variables we generated the ranking for all elements under objectives, challenges, and alternatives. We display the results of the ranking under the digitalization-related variable (using and not using digital technology) in Table A.2 and those under the financing gap-related variable (above and below median loan size) in Table A.1, both on Appendix A. The results in both cases do not change the supremacy of “Interaction-network,” suggesting that even after controlling for the financing gap and digitalization, the preferred SC-compatible policy remains “Interaction-network.” The results for other structural variables are not shown; they are available upon request. But in general they maintain the “Interaction-network” choice as the top

Table 2.4 Inconsistency index, AHP representative sample

		MEs	MSEs	MSMEs
Objectives	Meet end needs	0.000	0.058	0.099
	Catalyze community and individual potential	0.000	0.000	0.058
	Concerns over poor socioeconomic conditions	0.000	0.058	0.058
Challenges	Financial constraints	0.052	0.000	0.037
	Human resources constraints	0.030	0.106	0.069
	Institutional constraints	0.000	0.000	0.000
	Infrastructure constraints	0.000	0.012	0.000
Problems	Lack of interaction	0.017	0.040	0.108
	Lack of government support	0.026	0.044	0.017
	Sales financing	0.022	0.028	0.150
	Access to financing	0.023	0.063	0.046
	Costs of financing	0.000	0.130	0.000

Notes $CI = 0$ indicates perfect consistency where maximum eigenvalue is equal to n , the number of independent rows

Table 2.5 Inconsistency index of Social Planner-MSME using ANP

		MEs	MSEs	MSMEs
Objectives	Job creation & equality	0.037	0.037	0.037
	Reliance on MSMEs	0.037	0.018	0.009
	Inclusive growth & competitiveness	0.130	0.130	0.062
Challenges	Financial capacity	0.040	0.037	0.033
	Institutional capacity	0.047	0.093	0.057
	Data on MSMEs	0.081	0.081	0.081
Alternatives	Facilitate business	0.000	0.000	0.000
	Interaction-network	0.000	0.000	0.000
	Regulation and legal matters	0.000	0.000	0.000

Notes $CI = 0$ indicates perfect consistency where maximum eigenvalue is equal to n , the number of independent rows

Table 2.6 Inconsistency index of Social Planner-MSME using AHP

		MEs	MSEs	MSMEs
Objectives	Job creation & equality	0.037	0.037	0.037
	Reliance on MSMEs	0.037	0.052	0.052
	Inclusive growth & competitiveness	0.062	0.062	0.062
Challenges	Financial capacity	0.097	0.093	0.051
	Institutional capacity	0.070	0.089	0.085
	Data on MSMEs	0.088	0.085	0.086

Notes $CI = 0$ indicates perfect consistency where maximum eigenvalue is equal to n , the number of independent rows

priority. Appendix E shows the radar charts for total MSME, ME, and MSE under the following structural variables: duration of firms operations (Fig. E.1), duration under BI supports (Fig. E.2), urban-rural (Fig. E.3), size of profit change (Fig. E.4), digital use (Fig. E.5), and exports-non exports (Fig. E.6).

To the extent the revealed ranking is derived after taking into account the complex interrelations among components in a network, the above results are robust, and they represent the consistent preference ranking of ME and MSE with respect to SC-compatible policy measures.

2.3 Preferred Policy-Mix

The idea of interaction between policies is central to the concept of policy-mix in which one policy may either reinforce the effect of, or create a trade-off with, other policies. When duplication and its significant implications on administrative costs could reduce not only the effectiveness but also the efficiency of the policy-mix, it is important that the choice of the mix takes into account the complexity and dynamics of SC-compatible requirements. The attempt should go beyond just finding a combination of interacting policies. It should include a strategy and the accompanying processes to achieve the policy-mix as part of the interplay. Unlike in unilateral actions, in joint actions one needs to consider the consequences of one action as well as of those of others, and integrate them to infer the joint consequences. It therefore involves a coordination. This requirement is important for the policy-mix to be implementable if social planners and MSMEs are to develop mutually satisfactory views.

Consider the case of providing funds for MSMEs, and establishing or strengthening MSME network with other stakeholders. When the two are combined, for example, directing financial assistance toward developing interactions through a network, the effectiveness is likely higher than if each is implemented separately. The criteria and conditions for allocating the funds are clearer, able to reduce the transaction costs, and, more importantly, MSMEs could benefit a lot more from such a policy-mix.² Nonetheless, a careful selection of the mix ought to be made to ensure that the outcome is indeed superior to that resulting from the case where each policy is taken independently. For this purpose, a preliminary step was taken prior to constructing the final network that contains the policy-mix. We first explored the critical elements capturing the prevailing social capital in the alternative policy measures.

From the earlier study (Azis, 2022), participation and coordination for information searching and business purposes are key elements of the social capital. Based on those elements, interactions among MSMEs emerged as key in our analysis of SC-compatible policies. As we expanded the analysis by considering the specific objectives and challenges faced by MSMEs, the associated SC-compatible policy is one that includes establishing a network for interactions. Furthermore, to meet the stated objectives and deal with the complexity of challenges that are relevant to the prevailing social capital, we broadened the scope and span of coverage to include interactions with other stakeholders. This led to the “Interaction-network” as one of the

² Not all cases, however, show the evidence of higher effectiveness of policy-mix, especially for a system involving complex problems and interactions (Martin, 2016). The selection of the mix matters considerably.

SC-compatible policy choices in the network-based analysis. At any rate, we developed a separate hierarchy for ME and MSE in which the objectives and challenges for each are carefully studied before coming up with the list of relevant SC-compatible policies (the hierarchies for these preliminary steps are available upon request).

Only after taking such steps we constructed a relevant hierarchy in which a set of choices of relevant policy-mix is listed at the bottom of the hierarchy in Fig. 2.6 for MSE and in Fig. 2.7 for ME. The objectives are re-adjusted from the ones used in the network analysis in order to make them relevant to the policy-mix applicable for MSE and ME. For example, the stated objective of utilizing individual and regional potential in the preceding case is now separated for ME and MSE. More specifically, in addition to the objective of catalyzing community's potential, MSE is also concerned with improving individual potential, hence "Catalyze community and individual potential" is listed as one of their objectives. For ME, the objective to catalyze the community potential is sort of expanded to include developing the region's economy. Somewhat related to it is the MSE's objective to "Meet end needs" whereas the corresponding objective for ME is to enlarge "Market share." Despite this distinction, however, the objective of catalyzing the potential of community activities received the highest priority for both, MSE and ME, for which the weight including catalyzing the individual potential for MSE equals to 0.452, and for ME equals to 0.406. As expected, the weight for the second highest rank is larger for MEs than for MSEs (0.325 compared to 0.292).³

For the challenges, we broke them down into two parts to include specific problems into which some challenges can be subsumed. More specifically, since facing competition with other products including imports implies the need for the government or social planners to implement some sort of trade regulation and competition policy, the role of social planner is paramount. Hence, such a possibility is covered under the specific components of institutional constraints, particularly "Lack of government support" and to some extent also "Lack of interaction."

The two most important challenges are "Financial constraints" (0.306) and "Human resource constraints" (0.263). Broken down into MSE and ME, the weights are 0.325 and 0.273, and 0.268 and 0.252, respectively. Translating those challenges into more specific problems, the kind of financial constraints considered most serious are associated with difficulties repaying loans (cost of financing: 0.422) and paying for activities related to sales (sales financing: 0.367). For MSE, the weights are 0.416 and 0.433, and for ME they are 0.373 and 0.358, respectively. In terms of institutional challenges, they ranked a lack of government supports at the top (0.521) with a greater weight for ME compared to MSE (0.551 versus 0.503), followed by a lack of interaction. In practice, the two can be interrelated in the sense that they expect that social planners will help establish a network for them to interact better with the relevant stakeholders. The interaction is also expected to help them compete with domestically produced and imported products.

³ Note that the difference between the hierarchy for ME and for MSE is only in the set of objectives. The set of challenges, specific problems, and policy-mix are the same for both.

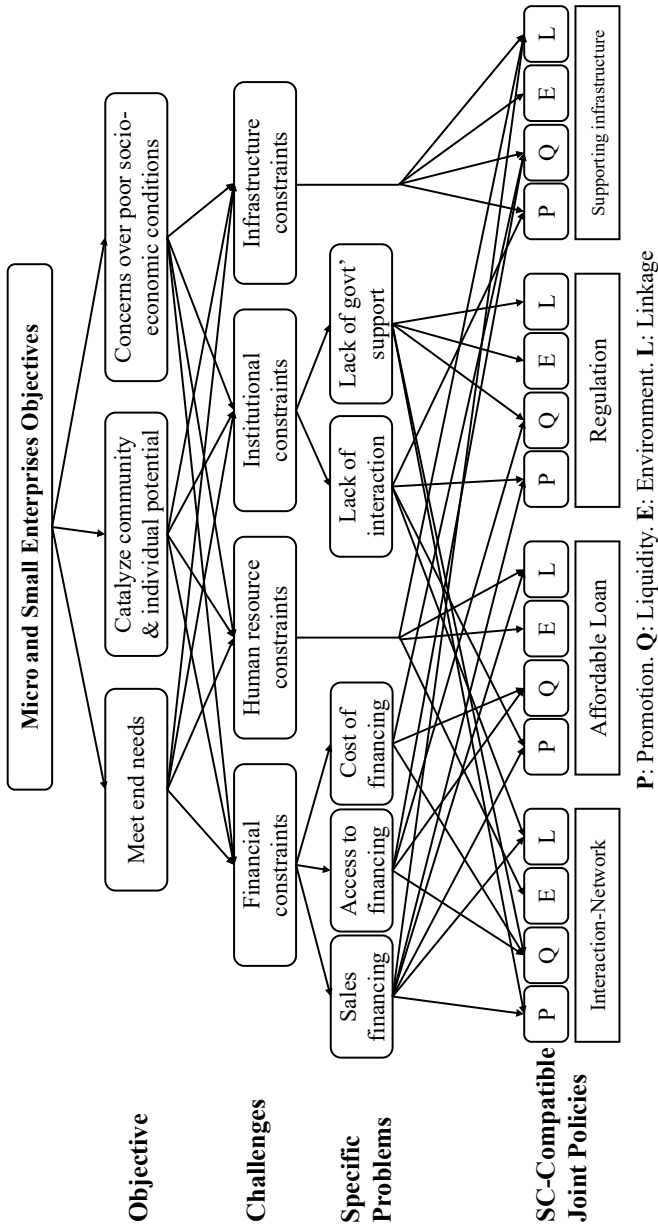


Fig. 2.6 Hierarchy structure for MSE policy-mix

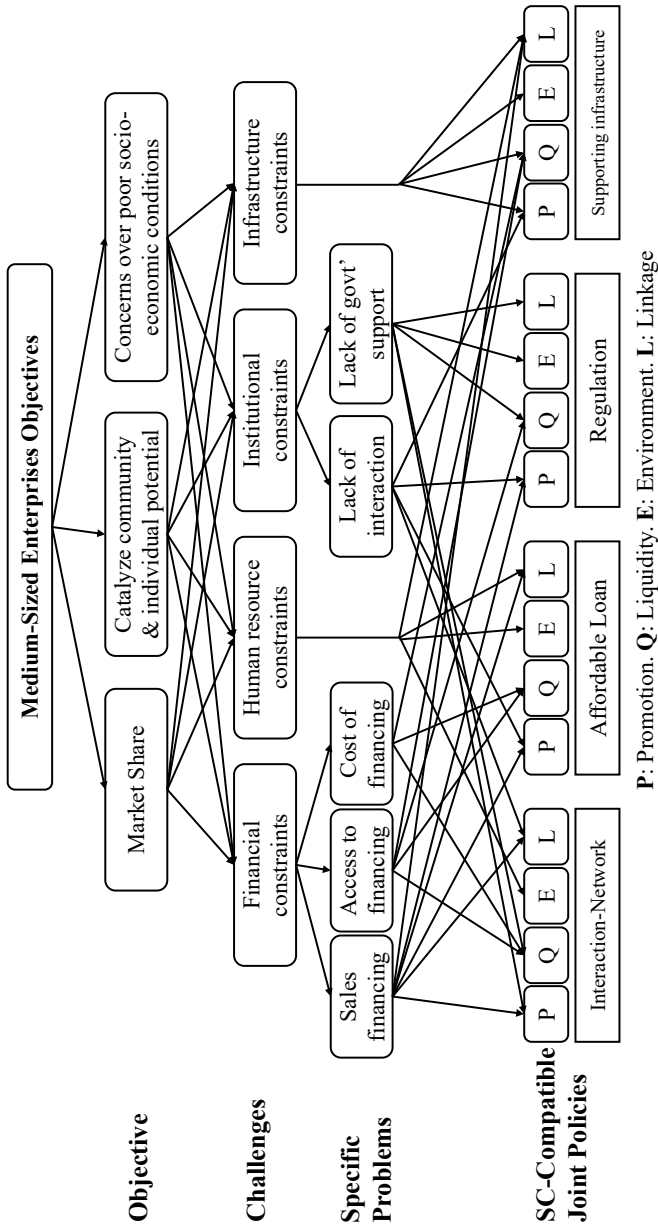


Fig. 2.7 Hierarchy structure for ME policy-mix

Having considered the challenges and the specific problems, we list the preferences of MSE and ME for the alternative policy measures at the bottom of the hierarchies in Figs. 2.6 and 2.7, respectively. The preferred alternatives consist of strengthening the promotion (**P**), providing liquidity supports (**Q**), giving the necessary information and tools available to assess the environmental impact of their activities (**E**), and making the linkages work more effectively (**L**).

For the promotion (**P**), most respondents expressed their preference to actively—and directly—involve (either physically or virtually) in exhibitions, trade fairs, and workshops. They also expect that the public and private sectors use more MSME products in various events such as meetings, seminars, and other gathering. For liquidity supports (**Q**), MSMEs expect that lending institutions especially banks could provide better access for low-cost lending to support the liquidity and refinancing needs of MSME end-borrowers. Given the prevalence of credit rationing and high transaction costs (discussed in greater details in Chap. 5), however, achieving this expectation may require special efforts and interventions from the lenders and the authority in charge of lenders' operations (financial regulators). Since lending to MSME in Indonesia is very low by international standard (see Figs 5.2 and 5.3 in Chap. 5), there should be room for improvements in this area.

As for the environmental impacts (**E**), many discussions we had with the respondents clearly indicated that most of them were aware of climate change because their activities had been impacted by it. For those MSMEs operating in the agricultural sector, the impact had been more direct and severe. To adhere with the environmentally sustainable goal, most of them also realize that they need to adopt practices that are less harmful to the environment.⁴ This applies particularly to MSMEs that are involved in some supply chain networks as they are required to do so by other parties in the supply chain.

But for many MSMEs, accessing the information about changes to be made and meeting the required costs for such changes are too challenging. They expect the government or other relevant institutions can provide tools and guide them to obtain those information, including the explanation on how to access green financing. We found a lot of issues they raised were similar with those expressed by MSMEs in other countries reported by the WTO based on their 2021 and 2022 surveys on over 35,000 MSMEs across 30 countries (WTO, 2022).

On making the available linkages more effective (**L**), most respondents expressed their strong wish to have a better coordination with other stakeholders such as larger firms, suppliers, lenders, regulators (including security apparatus), customers, and other MSMEs. Their interactions with each of those stakeholders could have, at a varying degree, profound impacts on their operations.

⁴ For MSMEs in many indigenous communities, environmentally sustainable practices had been applied way before the Sustainable Development Goal (SDG) concept was launched by the United Nations. Those practices had been adopted since their ancestors' time. During the interviews, members of these communities expressed their views clearly that violating sustainable practices is seen as creating not only environmental problems but also serious disruptions to human security, health, happiness, and inequality.

In the policy-mix, the above alternative measures are individually paired with the following set of policy measures: Interaction-network, affordable loan, regulation, and supporting infrastructure (see again the bottom level of the hierarchies in Figs. 2.6 and 2.7).

Results of the survey show that the ME preference is clearly toward a policy-mix that includes establishing a network for interaction (“Interaction-network”). For them, that policy is better combined with “Linkage requirement” and “Promotion.” For MSE, however, the “Linkage requirement” is ranked the highest when combined with “Infrastructure,” and the second highest when combined with “Interaction-network.” Note that interaction is associated with the number of network (quantity) while linkages are more related to the quality—hence the effectiveness—of network. Interestingly, MSEs also put a policy-mix of “Infrastructure” and “Liquidity” at a relatively high ranking (third highest), given the fact that compared to the medium enterprises MSE often encountered cash flow or liquidity problems in conducting their activities. At any rate, looking at the collective ranking of ME and MSE, the policy-mix involving “Interaction-network,” “Linkage requirement,” “Infrastructure,” and “Liquidity” were at the top three of the ranking.



Survey story: Listening to the community in Galo Galo village, off Morotai island, North Maluku, about their problems and challenges. The main sources of their income are from seaweed and salted fish production, and also tourism. Attempts have been made by the local government and other ministries, as well as researchers from a local university in Morotai, to help provide vocational empowerment program, counseling on seaweed cultivation, ways to improve the quality of salted fish production, guidance to utilize mangrove roots for producing soap, and training to prepare financial report as part of the requirements to apply for loans. From those and other efforts, it was clear that opportunities to raise productivity were there, but a lack of networking made the community unable to utilize such opportunities

Looking at ME and MSE separately, MSE's preference is overwhelmingly toward a mix of facilitating a network and improving the infrastructure (.123). On the other hand, the most preferred policy-mix for ME is overwhelmingly for network and linkages. Looking at the ranking further, the difference between the preference of MSE and that of ME is fairly stark. Although both clearly point to the importance of network for interaction, the next policy-mix preferred by MSE is infrastructure improvement combined with liquidity provision, and creating a network mixed with conducting promotion. On the other hand, the next policy-mix preferred by ME is to improve the infrastructure combined with strengthening linkages, followed by a combination of improving the infrastructure and providing liquidity support. It is therefore clear that the most highly ranked pairs of policies always include creating a network, improving the infrastructure, supporting liquidity conditions, and conducting the promotion. Table 2.7 summarizes the final ranking of the SC-compatible policy-mix based on the perceptions of ME and MSE discussed above. The ranking results under two structural variables—digitalization (using and not using digital technology) and financing gap (above and below median loan size)—are shown in Appendix A, Tables A.3 and A.4, respectively. The results under other structural variables are not shown here; they are available upon request. There are essentially no meaningful differences in the preference ranking under those structural variables and those discussed above.

The resulting preference ranking of the social planners, however, is very different. The hierarchy for the social planners' views toward MSE and ME is shown in Figs. 2.8 and 2.9, respectively. The dominant joint-policy according to them, summarized in Table 2.8, is to provide affordable loan and to strengthen the financial liquidity of MSMEs. The combined policy of providing loan and strengthening the linkage is only ranked the next. Interestingly, although the same applies to MSEs, the results for MEs are slightly different. While social planners continue to place affordable loan as the top priority, they seem to realize that for MEs such a policy needs to be combined with strengthening the linkage.

Nonetheless, similar to the survey results discussed in the preceding chapter, in general social planners tend to consider providing funds to MEs and MSEs as the "solution" to almost all problems. On the other hand, facing day-to-day challenges and working under conditions within the prevailing social capital, MSMEs think differently. As revealed in this chapter and the preceding one, for them networking is the highest priority.

The question now is, are those preferred SC-compatible policies and the policy-mix of ME and MSE implementable in the sense that they are aligned with their joint incentives and the desired objectives? What if the respondents were not entirely truthful in conveying the information, and were only interested in their own preferences but not those of others including the social planners? If those preferred SC-compatible policies are the Nash equilibrium outcomes, is there a mechanism that implements the so-called social choice rule (SCR) in such an equilibrium? We will explore these fundamental questions next.

Table 2.7 Summarized ranking of policy preferences of ME, MSE, and MSME (AHP)

Hierarchy component	MEs	MSEs	MSMEs	
SC-compatible joint policies	<i>Interaction-Network</i>			
	Promotion	0.116	0.095	0.103
	Liquidity	0.075	0.094	0.087
	Environment	0.083	0.078	0.080
	Linkage requirement	0.135	0.122	0.127
	<i>Affordable Loan</i>			
	Promotion	0.022	0.029	0.026
	Liquidity	0.030	0.049	0.041
	Environment	0.041	0.045	0.044
	Linkage requirement	0.029	0.032	0.031
	<i>Regulation</i>			
	Promotion	0.033	0.035	0.035
	Liquidity	0.059	0.026	0.036
	Environment	0.022	0.014	0.017
	Linkage requirement	0.019	0.013	0.015
	<i>Infrastructure</i>			
Promotion	0.080	0.083	0.083	
Liquidity	0.095	0.108	0.103	
Environment	0.052	0.055	0.054	
Linkage requirement	0.110	0.123	0.119	
Institutional constraints	Lack of interaction	0.449	0.497	0.479
	Lack of government support	0.551	0.503	0.521
Financial constraints	Sales financing	0.358	0.373	0.367
	Access to financing	0.209	0.211	0.210
	Costs of financing	0.433	0.416	0.422
Challenges	Financial constraints	0.273	0.325	0.306
	Human resource constraints	0.252	0.268	0.263
	Institutional constraints	0.243	0.171	0.195
	Infrastructure constraints	0.232	0.236	0.235
Objectives	Meet end needs/market share	0.325	0.292	0.304
	Catalyze community and individual potentials	0.406	0.452	0.435
	Concerns over poor socioeconomic conditions	0.269	0.256	0.261
Observations	40	69	109	

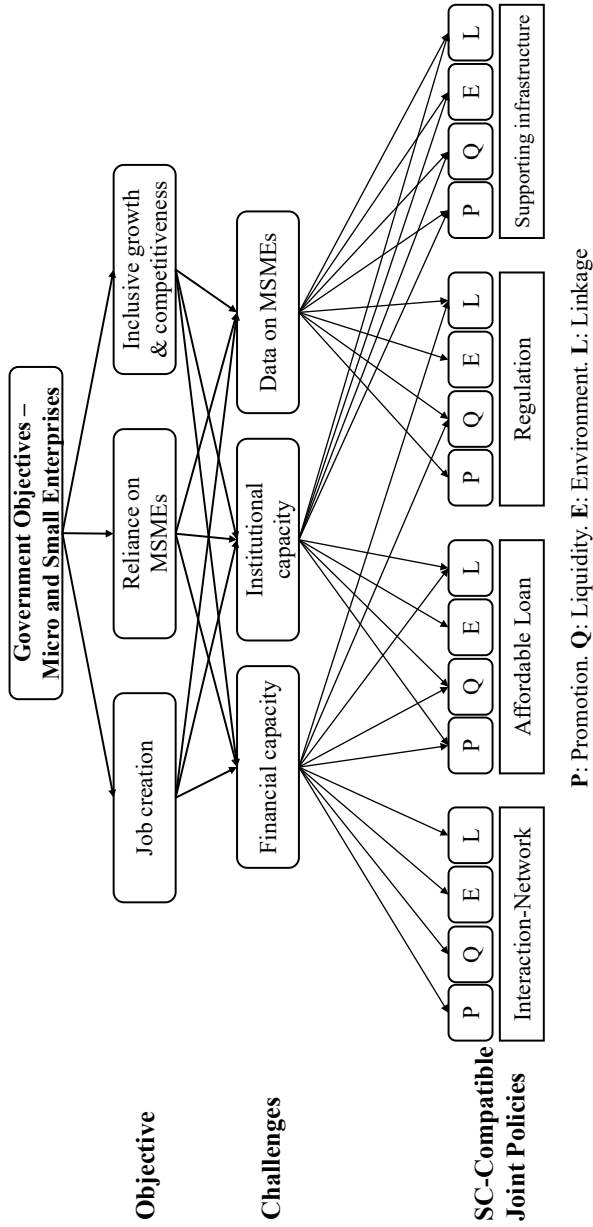


Fig. 2.8 Hierarchy structure for social planner and MSE policy-mix

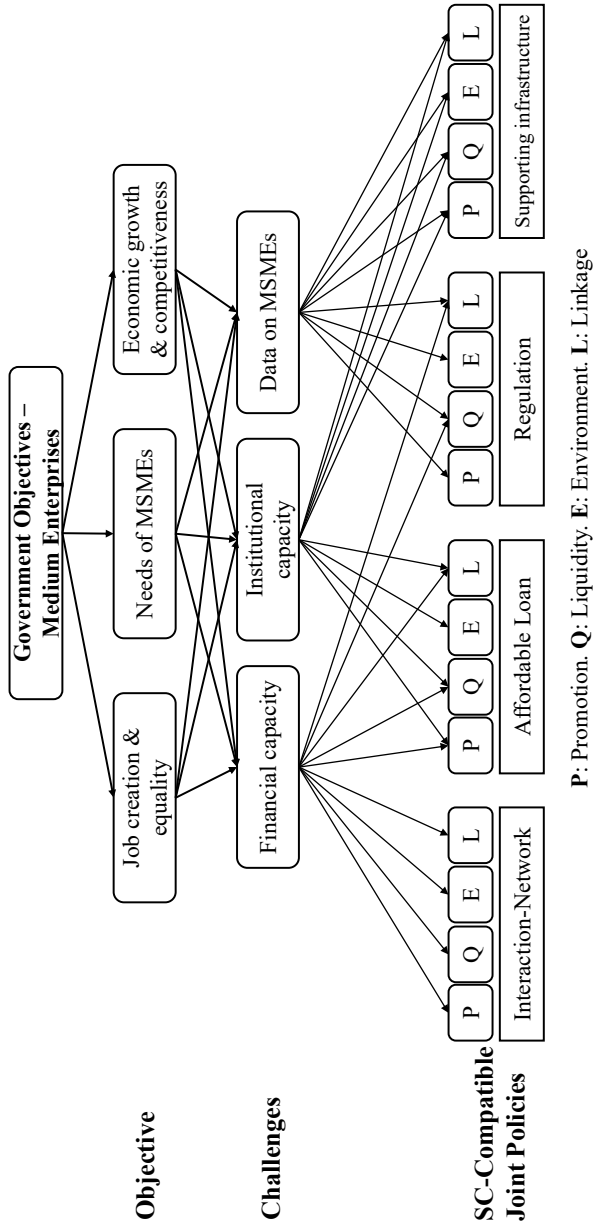


Fig. 2.9 Hierarchy structure for social planner and ME policy-mix

Table 2.8 Summarized ranking of SC-compatible policies of social planner-ME and social planner-MSE

Hierarchy component		MEs	MSEs	MSMEs
SC-compatible joint policies	<i>Interaction-Network</i>			
	Promotion	0.016	0.028	0.029
	Liquidity	0.045	0.102	0.086
	Environment	0.020	0.022	0.020
	Linkage	0.085	0.048	0.097
	<i>Affordable Loan</i>			
	Promotion	0.078	0.085	0.086
	Liquidity	0.121	0.230	0.205
	Environment	0.008	0.007	0.006
	Linkage	0.253	0.135	0.121
	<i>Regulation</i>			
	Promotion	0.037	0.026	0.026
	Liquidity	0.092	0.102	0.103
	Environment	0.017	0.021	0.020
	Linkage	0.134	0.068	0.075
	<i>Infrastructure</i>			
	Promotion	0.019	0.025	0.024
	Liquidity	0.027	0.045	0.043
	Environment	0.010	0.012	0.013
	Linkage	0.040	0.045	0.046
Challenges	Financial capacity	0.648	0.648	0.641
	Institutional capacity	0.079	0.079	0.087
	Data on MSMEs	0.272	0.272	0.272
Objectives	Job creation	0.188	0.188	0.179
	Reliance on MSMEs	0.081	0.081	0.113
	Inclusive growth & competitiveness	0.731	0.731	0.709

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Chapter 3

Implementability of SC-Compatible Policies



Having identified a list of SC-compatible policies, and given the fact that the preferences of micro and small enterprises (MSEs) are not always the same as those of the medium enterprises (MEs), let alone with the social planners' perspectives, some of the proposed policies can neither be aligned with the desired goals nor accepted by all agents. Which among those policies and policy-mix that can be aligned? Is there an institutional setting or a mechanism that could be designed to implement those policies? The discussions in this chapter address these questions. The emphasis is on finding the institutional setting or mechanism that would ensure the selected policies and policy-mix are aligned with the desired goals and accepted by all agents (MSEs and MEs). One of the challenges in trying to identify such a mechanism is the possibility that the information or the policy ranking conveyed by each of the agents may not represent the true conditions due to either the circumstances they were under, or they simply were not being fully truthful when expressing their preferences. This and other issues surrounding the mechanism to implement the selected policies are also discussed.

Unlike in the previous chapter, where our focus was trying to identify the preferred policies and policy-mix (endogenous policies), what we are looking for here is the institutional setting or the mechanism, given the set of ranked policies. Hence, it is the mechanism, not the policy, that is endogenous. The specific question to ask would be: Are the selected policies and policy-mix identified in the previous chapter implementable in the sense that they can be aligned with the desired goals and accepted by all agents involved? To address this question, a particular approach based on the *mechanism design theory* (MDT) is used.

The bulk of this chapter is devoted to responding to two key questions of interest: Which among the preferred SC-compatible policies and policy-mix revealed in Chap. 2 are implementable in the sense that they are aligned with, and can be accepted by, MSEs and MEs; and are there an institutional setting or mechanisms that can be designed to implement them? The organization of this chapter is summarized

in Fig. 3.1. We begin in the next Sect. 3.1 with the discussions on the MDT before showing its applications to our survey results and the implementability of the selected policies in Sect. 3.2.



Survey story: Farming outside Pontianak, West Kalimantan, where a farmers association (*Gapoktan*) was formed to counter the middlemen so that they can get better prices for their products. Efforts to raise productivity at the production side by using digital farming did not give significant results since a more important challenge for the farmers was on the downstream side, i.e., marketing. With the help of local BI office, the association worked together with an internet-based marketing firm from which farmers received better prices. A cooperation through the network between farmers and a private institution such as this was made possible by their mutual trust and understanding about the real challenges faced by farmers, and the importance of serving local community with local products

3.1 Methodology: Mechanism Design Theory (MDT)

When agents have different sets of policy preference, how do we reconcile the difference such that the outcome reflecting the desired goal is achieved based upon which selected policies are implementable? If such policies exist, what kind of institutional setting or mechanism can be applied to ensure that the desired goal is achieved? This is a typical problem addressed by the MDT, where agents' preference is reflected in his/her type (θ) and decision ($d \in D$). Based on his/her strategy ($s \in S$) following that strategy, an outcome ($a \in A$) and a level of utility ($v(s, \theta)$) are obtained. For

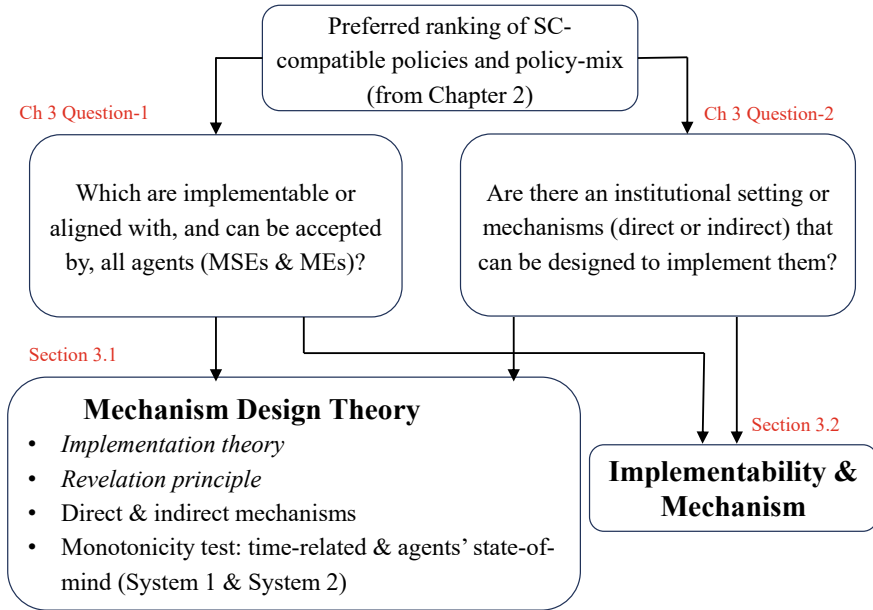


Fig. 3.1 Organization of this chapter

each agent i , the outcome is $a_i(d(\theta_i))$ and the strategy (message) is $s_i(d(\theta_i))$. The predetermined desired goal, often referred to as social goal, is embodied in the so-called “social choice function” (SCF), $f(\theta) \subset A$, where $f(\theta)$ consists of optimal (best) outcome in state θ . Hence, $f(\theta)$ maps a type profile θ to an outcome. Having agents sent the messages, following the MDT the equilibrium in the game can be designed to implement the social choice function $f(\theta)$.

There is the *original mechanism* whereby N number of agents ($N = 1, \dots, n$) send messages (s_1, \dots, s_n) that will result in optimal outcomes aligned with the SCF. The problem is that agents may not tell the truth about their type, that is, the sent messages may be untruthful, $(s'_1, \dots, s'_n) \neq (s_1, \dots, s_n)$. The main task is therefore finding out if there is a *new mechanism* through which those untruthful messages, when embedded into that new mechanism, can be “adjusted” to become truthful such that an optimal outcome aligned with the SCF can be achieved. When such a mechanism is found, there are no longer incentives for agents to lie. Sending untruthful messages will give them a lower utility. Another way to put it, whatever messages agents sent, they will be “adjusted” by the *new mechanism* to become truthful messages.

The question is: are there such mechanisms? If so, how do we find them? This is essentially the problem that MDT addresses, which is in contrast with a standard game theory where the rule of the game or the mechanism is already given, and the outcome of the game is what the players are looking for. In MDT, the process is the reverse: the outcome is given and the rule of the game or the mechanism is what the designers are looking for (the mechanism is endogenous).

Finding a class of mechanisms or institutions whose equilibrium outcomes implement a given set of normative goals or welfare criteria is a tedious task. It was Vickrey (1961) who first showed that if preferences are restricted to the case of quasi-linear utility functions, then the mechanism dominant strategy is dominant-strategy implementable. Advanced further by other researchers, the whole concept eventually led to the development of *implementation theory*, one of the central tenets of MDT that has profound implications on policy creation. According to the theory, if a mechanism has the property that each agent's dominant strategy is to honestly report the truth, then a social choice rule (SCR) is dominant strategy incentive compatible (also termed *strategy-proof*).¹

In our context, agents' strategies and outcomes are the MSMEs' ranking of preferences toward different SC-compatible policies which depends on their state or type θ (can be unknown). While in general θ can take different forms, such as production technology, available resources, and agents' payoffs from outcomes $a \in A$, in our case we assigned two forms of θ : a time-related attribute, more specifically pre-COVID versus late COVID, and agents' state of mind attribute, more specifically quick/fast think versus comprehensive/slow think. Given a rather complex nature of the interconnections among goals, challenges, and alternative policies or policy-mix, there is a high likelihood that the preference revealed by MSMEs varies due to their different perception toward these factors. The ranking also may not reflect the true type of MSME. If we are to find the implementable policies out of several alternatives, the information on agent's actual type is critical not only because different states or profiles may cause different rankings of policies but also because it is necessitated by the so-called *monotonicity* test (see Appendix D for the explanation and example).²

Consider two groups or agents, say, MSE and ME. According to the test, if under a certain state or profile an alternative $x \in X$ is selected by one group and x does not fall in rank in any groups' preference ordering in different state or profile, then x must still be selected. The question is, if the policy choices reflect MSE or ME preferences, what different states of mind or profiles (θ) are to be used in the monotonicity test? To address this issue, we used another scenario of preference ranking. The alternative scenario was derived from the results of a sensitivity analysis applied to both the AHP and the ANP ranking discussed in Chap. 2 and this chapter.

The first scenario is a profile in which the ranking of preferences revealed by MSMEs reflects what Kahneman (2011) referred to as the "slow think" or System

¹ In practical term, a social choice rule (SCR) refers to selecting one (single) preferred choice, say, a political candidate in an election, whereas social welfare function (SWF) refers to the ranking of several candidates. Unlike Arrows' SWF (Arrow, 1951), the SCR does not rank non-optimal alternatives, although a SWF induces a natural SCR, that is, the correspondence which selects the alternatives top-ranked by SWF for each profile (Maskin, 1999).

² Implementability means there is an incentive-compatible mechanism that implements the stated SCF. There remains, however, a question of how one finds a mechanism that implements the SCF. It turns out it depends on the degree of incentive compatibility. If SCF is attainable by a mechanism which is dominant-strategy-incentive-compatible, the function is dominant-strategy implementable; if it is attainable by a mechanism which is Bayesian-Nash-incentive-compatible, the function is Bayesian-Nash implementable.

2. In this scenario, agents proceeded through a sequence of steps of retrieving the memory and using their cognitive program through a deliberate, effortful, and orderly process. This is where the goals and the challenges listed in the hierarchy and the network come into play (more discussions on this later). The result of our survey is the preference ranking under this system (System 2). The second scenario is more of “fast think” or System 1, where the preferences are revealed automatically and effortlessly without considering the objectives and challenges described in the hierarchy or network; instead, they are based on impressions and feelings.³ We obtained the preference ranking of this type by running a series of sensitivity analyses on our hierarchy and network results without including the goals and challenges (they were assumed to have virtually no effect on the policy alternatives). The results essentially reflect the MSMEs’ preference ranking without taking into account the complex interrelations among components within and between the stated goals and the challenges. It is equivalent to a ranking when MSMEs evoke quick first-time reaction to the question. Hence, we have a slower System 2 that represents one state/profile (say, θ) based on the construct thoughts in an orderly sequence of goals, challenges, and policy alternatives, and a faster System 1 that reflects the automatic response of MSME representing another state/profile, θ' .⁴ Designed to achieve improved productivity as the desired goal, the alternatives or choices take the form of either individual policies or joint policies that are SC-compatible.

Returning to the monotonicity test, a simple illustration is as follows. Consider f^{scr} as the social choice rule (SCR) of two types of players ($n = 2$). Points are assigned to each of k alternatives according to the preference of each type of player. Suppose there are two states/profiles $\theta = (\theta, \theta')$ and four policy alternatives ($k = 4$) in each state/profile; hence, $\mathbf{X} = \{x_1, x_2, x_3, x_4\}$. The criteria for choosing the policy alternative(s) is the largest sum of points. Referring to the example below, in state/profile θ the alternative x_2 has the most points (6, i.e., 3 plus 3, following the *Borda* count), so it is optimal and chosen by f^{scr} . In state/profile θ' , however, the optimal policy alternative is x_1 (it has the highest points = 6, i.e., 4 plus 2).⁵ Note that since x_2 falls in rankings going from θ to θ' , the monotonicity condition does not require it to remain optimal. Thus, in this case, monotonicity is not violated, and the chosen policy is implementable (see again Appendix D).⁶ In the language of

³ Capable of representing complex patterns of ideas and association, these impressions and feelings can be the main sources of agents’ explicit beliefs and deliberate choices of System 2. In some cases, System 2 takes over the freewheeling impulses of System 1.

⁴ For the hierarchical case, we also developed another type of scenarios to capture agents’ perceptions toward their preferences in different time. More specifically, we acquired agents’ preferences at the early stage of COVID-19 (in 2020), and then acquired the preferences of the same agents in the later stage of the pandemic (2022). We subsequently compared the two scenarios.

⁵ Assigning points to rank a set of alternatives in this way is known as the *Borda* count, although in its original form the lowest-ranked alternative gets 0 points, the next-lowest gets 1 point, etc., and if the number of alternatives is n , the highest-ranked alternative gets $n - 1$ points.

⁶ It is important to note that the proof of Maskins’ theorem on implementability works for at least three individuals due to the problem of identification, i.e., difficult to determine who deviates from his/her prescribed or equilibrium strategy if there are only two agents; see Maskin (2008). However,

Table 3.1 Example of monotonicity non-violating case

θ		θ'	
MSE	ME	MSE	ME
x_1	x_4	x_4	x_2
x_2	x_2	x_1	x_1
x_3	x_3	x_3	x_3
x_4	x_1	x_2	x_4

Table 3.2 Example of monotonicity-violating case

θ		θ'	
MSE	ME	MSE	ME
x_1	x_3	x_1	x_2
x_4	x_2	x_2	x_3
x_2	x_1	x_4	x_1
x_3	x_4	x_3	x_4

implementation theory, this is the case where the social planners' SCR can prescribe x_2 in θ and x_1 in θ' . This approach is called the direct mechanism (Table 3.1).

An example of violated monotonicity condition using a direct mechanism is as follows. Suppose x_1 is optimum in state/profile θ (total points equal 6), but is not optimum in θ' (x_2 is, with total points 7). Yet, x_1 does not fall against any other alternative, which, according to the monotonicity condition, should remain optimal. Hence in this case monotonicity is violated, and the chosen policy is not implementable. There is no mechanism that implements the SCR (Table 3.2).

The remaining question is, how one can find a mechanism that implements the policy. This is essentially a question about whether or not it is possible to find a mechanism *indirectly* without knowing the agent's true state/profile. That is, the designers have only the messages, i.e., the ranking under each state/profile, but not the state/profile itself.

In the direct mechanism example above, the designers ask the players directly about his/her individual type. If, on the other hand, a mechanism can be found without necessarily knowing the agents' type, that is, agents are asked to send only the ranking (messages and outcomes), not their state/profile, it is called the indirect mechanism. Applying to the above $k = 4$ and $n = 2$ case, such a mechanism is represented by the following game, where the moves of MSE are up (U) and down (D), and ME's are left (L) and right (R) (Table 3.3).

Suppose the actual state/profile (not the reported one) is θ . For ME, no matter what MSE chooses, the best strategy is taking left (L) because for them $x_2 \succ x_3$ if MSE picks U, and $x_4 \succ x_1$ if MSE picks D. Hence, L is the dominant strategy for ME

for a more general including a two-agent case, a characterization of the implementation possibilities has been shown in Dutta and Sen (1991) and Moore and Repullo (1990).

Table 3.3 First game example

		ME	
		L	R
MSE	U	x_2	x_3
	D	x_4	x_1

in θ . Since $x_2 \succ x_4$, the best strategy for MSE is U. That is, x_2 is a Nash equilibrium. If, on the other hand, the true state/profile is θ' , by using a similar procedure we can establish that ME plays R and MSE plays D, and the Nash equilibrium is x_1 . Therefore, this mechanism works in both θ and θ' , suggesting that social planners do not need to know the true state/profile, and yet the resulting outcome is optimal no matter what that state/profile is. Since the Nash equilibrium outcomes of the mechanism coincide with the optimal outcomes in each state, we can establish that the mechanism implements the social planners' SCR in Nash equilibrium.

Identifying this indirect mechanism is very important because in the direct mechanism shown earlier, even if social planner can ask MSE and ME directly, they may be untruthful. In this example, although the true state/profile is θ , MSE will tend to say that it is not. They are likely to say it is state/profile θ' because they always prefer x_1 to x_2 . On the other hand, ME always declares state/profile θ as the true one, even if it is actually θ' because they always prefer x_2 to x_1 . Such a risk is eliminated when an indirect mechanism can be implemented.

At this juncture, it is important to emphasize another critical principle in MDT known as the *revelation principle*, which is central to the analysis of implementability. It also addresses the distinction and relation between direct and indirect mechanisms.⁷ The principle essentially says that, if an SCF can be implemented by an indirect mechanism, then it can also be implemented by a truth-telling *direct revelation mechanism*. Thus, when considering implementation in dominant strategies, it is enough to look only at the SCF for which truthful is a dominant strategy. We can therefore consider only truthful mechanisms and be assured that such a mechanism exists, because any SCF that can be implemented by any mechanism can be implemented by a truthful direct mechanism.

The scheme in Fig. 3.2 captures the discussions above. Given agents' type θ_i and the strategies they choose ($s_i(\theta_i)$), when we apply the *original mechanism* the outcome would be (a_1, \dots, a_n) and the agents' utility is $u_i(a, \theta)$. If agents are being untruthful by using $s'_1(\theta_1), \dots, s'_n(\theta_n)$, embedding these untruthful strategies into the *original mechanism* will give us a *new mechanism*. This *new mechanism* adjusts the untruthful information to become truthful such that there is no point for agents to be untruthful. That is, the mechanism will adjust the information. Thus, the *revelation principle* allows one to solve for an equilibrium by assuming all agents truthfully

⁷ The early version of the principle was introduced by Gibbard (1973), and subsequently advanced by several others including Dasgupta et al. (1979) and Myerson (1986). The latter applied the principle by using, among others, the case of auction from which he developed the auction theory (Myerson, 1981).

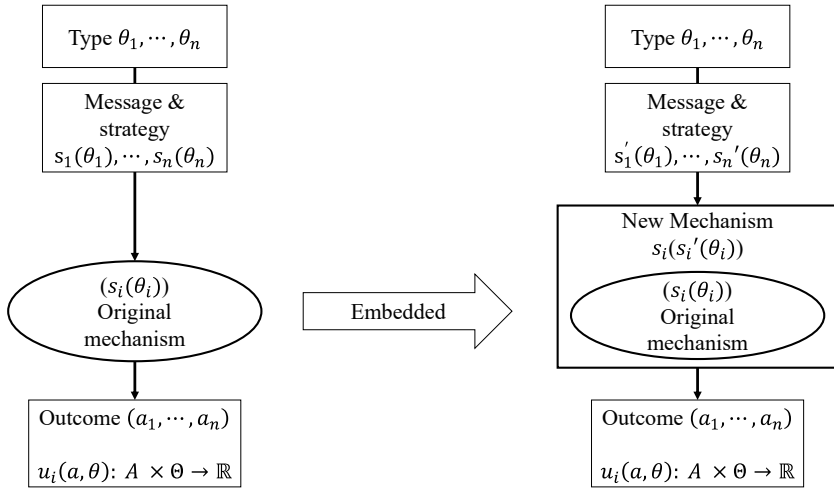


Fig. 3.2 Summarized system of MDT

report their type subject to an incentive compatibility constraint, eliminating the need for agents to consider either strategic behavior or lying. Note, however, that the equilibria generated by indirect mechanism are not always the same as those generated by direct mechanism. They are the same if agents are truthful. To the extent the outcome generated by indirect mechanism can be bad equilibria, indirect mechanism cannot (inherently) be better than direct mechanism.

The *revelation principle*, which implicitly suggests that truthfulness is not a restrictive assumption, is extremely useful since the designer or the social planner does not have to consider all possible strategies (games) that agents may take and choose one that best influences other agents' strategies to align with the SCF. Instead, they can simply consider games in which agents truthfully report their private information (direct mechanism).

Figure 3.3 summarizes the relation between the monotonicity test for implementability and the two types of mechanism: direct mechanism and indirect mechanism. The results of monotonicity test are obtained by applying an incentive-compatible direct mechanism in which being truthful (T) is the dominant strategy. In some cases, an indirect mechanism can be established, where sent messages do not have to be truthful. Any implementable strategy in such a mechanism is also implementable in direct mechanism (following the *revelation principle*), although the resulting equilibria from the indirect mechanism can be either the same or different from those generated by the direct mechanism ($\text{Equilibria}^* \neq \text{Equilibria}$). They are the same if agents are truthful (T), or can be different if some of them are not truthful (U). If the latter holds, the results of indirect mechanism can be bad equilibria, implying that indirect mechanism cannot be better than direct mechanism.

Since it has been proven that any equilibrium outcome of an arbitrary mechanism can be replicated by an incentive-compatible direct mechanism, the optimal mechanism can always be found within a sub-class consisting of direct mechanisms

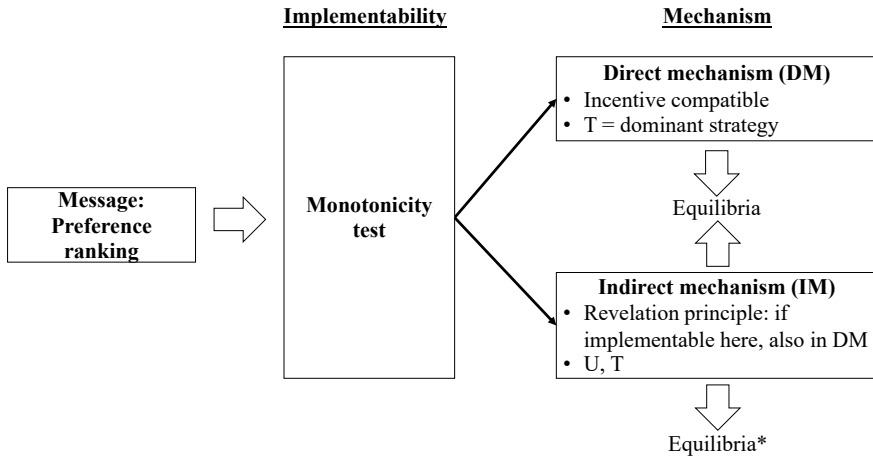


Fig. 3.3 Summarized relationship of monotonicity test and mechanisms

(Myerson, 1986). The discussions on implementability and the monotonicity condition in the next section use largely the direct mechanism, although in some cases we also show the indirect mechanism to identify which SC-compatible policies or policy-mix that are in equilibrium and implementable.

3.2 Implementability

From the discussions in Chap. 2, we found that our MSME respondents placed “Interaction-network” and “Supporting infrastructure” as the most important SC-compatible policy measures for productivity improvement. This is consistent with how they ranked the policy-mix, in which a combination of policy to create a network and improve infrastructure was selected as the one having the highest priority. The question is, are these policies and policy-mix implementable in the sense that they are incentive-compatible and aligned with the social choice function (SCF)?

As indicated earlier, we need to conduct monotonicity tests to check the implementability of policy choices based on the hierarchies in Figs. 2.6 and 2.7, as well as on the networks in Fig. 2.5. Before conducting such tests, we first need to explore the truthfulness of the state/profile under which MSMEs made such rankings. One relevant issue to explore is whether the ranking revealed by MSMEs during the survey was made after they carefully analyzed the objectives and the challenges (*‘think slow’*, or System 2), or was it made based on their quick and automatic response to the questions with minimum efforts (*‘think fast’*, or System 1). The former state/profile is denoted by θ , and the latter by θ' .

We are also interested in another scenario involving panel data. More specifically, we wish to find out whether or not MSME perceptions changed after the devastating COVID pandemic. Have they become more pessimistic and anxious, or more positive,

holistic, ethical, and environmentally conscious in contemplating their role or life in general? The state/profile when the COVID hit is denoted by θ' (2020 survey) and by θ (2022 survey) when the pandemic has abated. For that purpose, we used the preference ranking revealed by the same respondents who participated in both surveys and made the questionnaires in the two surveys to be comparable.

There were five alternative choices in the 2020 survey, comprising of three policies and two social capital capable of influencing cooperation for collective action. The three policies consist of: one, to promote and support linkages or interaction between MSMEs and the relevant stakeholders; two, to provide financial and technical support and launch promotion; and three, to use digital and green technologies.



Survey story: Aiming to empower local women, improve their quality of life and revive the local weaving tradition, an MSME in Kupang, East Nusa Tenggara, employed local weavers like this to utilize their skills by using local materials. By building a network of many women weavers, the MSME was able to help transforming the weaving tradition from something with only cultural values to a source of income for local women. During our survey, we found several similar cases in other areas throughout East Nusa Tenggara

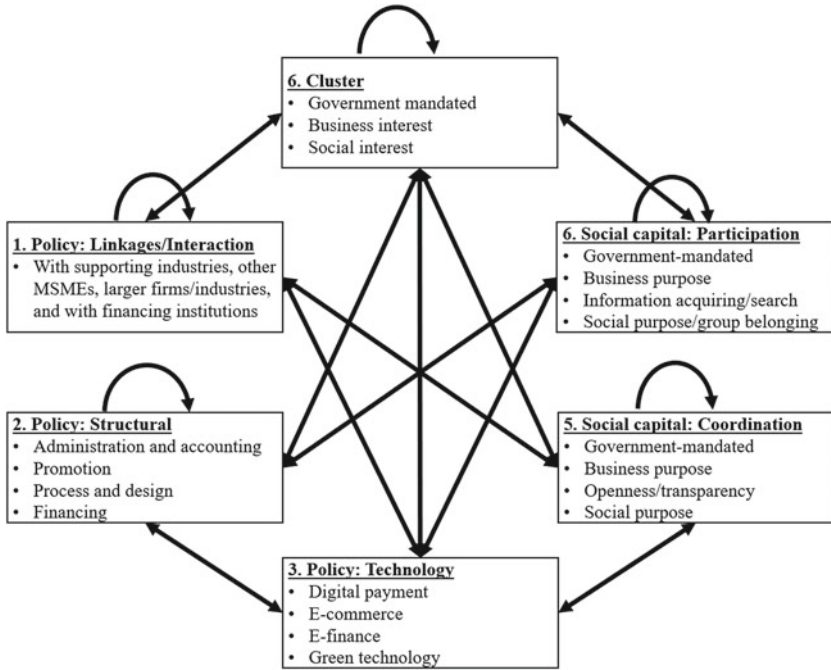


Fig. 3.4 Interplay of policies and social capital: A network of feedback and interrelations

For the social capital part, the two components that support cooperation are participation and coordination. Replicated from Fig. 4.4 of Azis (2022), Fig. 3.4 shows the network capturing those five alternative choices, their interactions including feedback effects, and the contents (elements) of each of those choices. We matched five alternative choices with the six policy measures in the 2022 survey shown in Fig. 2.5 earlier. For the ranking of preferences, in the first case we used the results obtained from the 2020 survey since they were exactly the same five policy choices, and for the 2022 case we combined “Interaction-network” and “Regulation & legal matters” by taking their average weight before normalizing the priority ranking.⁸

The results of the concordance between the two sets of policy choices and the corresponding ranking of preferences are listed in Table 3.4. The ranking for ME and MSE according to the 2022 survey is shown in the first two columns (under state/profile θ), and the ranking from the 2020 survey is in the next two columns (under state/profile θ'). Notice that the two rankings were not the same. While the top-ranked policy was always “Linkage/Interaction,” the second- and the third-ranked

⁸ Many of the institutional constraints MSMEs have to deal with are related to regulations and other legal uncertainty. Resolving them needs the involvement of both the government and the security apparatus, with whom most MSMEs do not have good and effective relations or network. Hence, the preference to have a better “Interaction-network” is somewhat parallel with the desire to overcome the regulation and legal matters.

Table 3.4 Monotonicity test for direct mechanism: Did COVID alter MSMEs' perceptions?

θ			
ME total		MSE total	
Linkage	0.260	Linkage	0.277
Coordination	0.232	Technology	0.228
Structural	0.192	Coordination	0.193
Technology	0.172	Participation	0.171
Participation	0.144	Structural	0.130
θ'			
ME total		MSE total	
Linkage	0.281	Linkage	0.255
Technology	0.263	Technology	0.235
Coordination	0.164	Coordination	0.197
Structural	0.150	Participation	0.168
Participation	0.142	Structural	0.145

choices were different, depending on whether or not the respondents considered the complex relations between objectives, criteria, and policies when revealing their preference. If they did (θ), ME and MSE picked different choices such that the following pairs were for the second and the third rank, respectively: “Coordination” with “Technology” and “Structural” with “Coordination.” On the other hand, if all the complex relations were ignored (θ'), implying that the respondents gave their direct ranking of policies instantly, the selected pairs were exactly the same, i.e., both ME and MSE picked “Technology” and “coordination” for the second and the third ranks, respectively.

What about the optimal choice of both players? If the true state/profile is θ , both MSE and ME found the “Linkages/Interaction” policy to be optimal, where the weight sum equals to 0.537 (0.260 plus 0.277). The same policy is found optimal if the true state/profile is θ' where the weight sum is 0.536. Thus, social planners know what policy to take regardless of the true state/profile. We can therefore surmise that the shock due to the COVID pandemic did not alter MSME perceptions in assigning the highest priority to the preference to have a network. Most MSMEs were of the opinion that being involved in a network would enable them to have more interactions (quantity of network) and greater linkages (quality of network) with the stakeholders.

Next is to check the implementability of SC-compatible policies based on the network in Fig. 2.5. The state/profile we used refers to the circumstances under which MSMEs revealed their preferences. The fact that the ranking of policies obtained from the survey was based on the complex interactions involving feedback effects between objectives, challenges, and policies, it reflects System 2 where they essentially applied the cognitive program through a deliberate and orderly process. This is denoted by θ . But there is also a scenario where the state was much simpler: i.e., they revealed the preferences by using System 1 based on their impressions and feelings, without considering how those preferences were related to any of the objectives,

Table 3.5 Monotonicity test for direct mechanism: Preferred policies of ME and MSE

θ			
ME total		MSE total	
Interaction-network	0.239	Interaction-network	0.228
Supporting infrastructure	0.187	Supporting infrastructure	0.196
Regulation & legal matters	0.185	Regulation & legal matters	0.163
Facilitate information	0.155	Facilitate business	0.161
Facilitate business	0.140	Facilitate information	0.138
Financing	0.093	Financing	0.115
θ'			
ME total		MSE total	
Supporting infrastructure	0.244	Supporting infrastructure	0.243
Financing	0.203	Financing	0.193
Regulation & legal matters	0.166	Regulation & legal matters	0.161
Interaction-network	0.162	Interaction-network	0.158
Facilitate information	0.132	Facilitate information	0.145
Facilitate business	0.093	Facilitate business	0.100

challenges and anything else. Such a state/profile is denoted by θ' . It is not surprising that the resulting ranking was different, in that the equilibrium outcome under θ was “Interaction-network,” while that under θ' was “Supporting infrastructure”; see Table 3.5. This finding is unlike the earlier results when we tested the possibility of a change in MSMEs’ perceptions due to the COVID pandemic, where “Linkage” being the optimal outcome in both θ and θ' .

Does this mean “Interaction-network” is no longer implementable? In the above case, social planners know what policy to take given a particular state/profile. What about the case if they do not have such information? This is where monotonicity test can be helpful. In moving from state θ to θ' , the ranking of “Interaction-network” falls from the first to the fourth. According to the monotonicity condition, a different equilibrium from “Interaction-network” can be optimal. In this case, the new optimal SC-compatible policy is “Supporting infrastructure.” Since the monotonicity condition is not violated, there is a mechanism that implements SCR. By considering only four SC-compatible policies (the remaining two received the lowest ranking), Table 3.6 shows such a mechanism. Notice that no matter what the true state/profile is, if θ is the true state the Nash equilibrium outcome is always “Interaction-network” as MSE always prefers strategy U and ME prefers strategy L. Similarly, when the true state/profile is θ' , the equilibrium outcome is always “Supporting infrastructure.”

Thus, even without knowing the true state/profile, the predicted outcome or Nash equilibrium based on the preferred strategies of MSE and ME is the same as the desired (social) outcome. We can therefore establish that the mechanism implements the social choice rule in Nash equilibrium because the equilibrium outcomes of the mechanism coincide with the optimal outcomes in each state/profile.

Table 3.6 Indirect mechanism to align MSE and ME preferences with SCF under pre-COVID and abated COVID state/profile

		ME	
		L	R
MSE	U	Interaction-network	Regulation & legal matters
	D	Financing	Supporting infrastructure

The next to test is the set of SC-compatible policy-mix. By using the same specifications of the state/profile as before (System 2 for θ and System 1 for θ'), the following Table 3.7 shows the preference ranking.

Recall that in any policy-mix cases, the results identify the preference ranking of pairs of SC-compatible. Based on the weight of each pair, the combination of “Interaction-network” and “Linkage” is the most optimal under θ , and the same pair is also optimal under the state/profile θ' . Since the ranking of that pair is not altered from θ to θ' , this optimal policy-mix is implementable. Thus, the SCR prescribes “Interaction-network & Linkage” in each state/profile.

Similar to the preceding case, even without knowing the true state/profile the predicted outcome or the Nash equilibrium based on the preferred strategies of MSE and ME is the same as the desired (social) outcome. The indirect mechanism that supports such a conclusion is shown in Table 3.8. If the true state/profile is θ , ME would prefer strategy L expecting to get “Interaction-network & linkage” because that policy-mix is ranked at the top. The choice made by MSE is to take the U strategy because as shown in Table 3.7, the “Interaction-network & Linkage” is preferred to “Interaction-network & Promotion.” On the other hand, if the true state/profile is θ' , ME would take strategy R to get “Supporting infrastructure & Linkage,” which is ranked the highest, and MSE takes strategy D to get the same policy-mix. Hence, regardless of the true state/profile, the mechanism always gives a Nash equilibrium outcome that coincides with the outcome obtained from using the direct mechanism.

Reviewing the precise wording (in *Bahasa*) used during the survey, in the network-based questionnaire most of the statements were very closely related to having a network with the stakeholders, such as increasing the number of business links (“*relasi bisnis*”) and getting the benefits from cooperating with other businesses, suppliers, supporting industries, communities, and government apparatus (“*bantuan kerjasama dengan bisnis lain, supplier, industri pendukung, masyarakat sekitar, dan perangkat pemerintah*”). In the hierarchy-based questionnaire for policy-mix, the corresponding wordings were similar and even broader: increase business relation (“*Memperbanyak relasi bisnis*”), get access to participate in the supply chain involving other firms including large and other businesses (“*Bantuan peningkatan akses untuk bisa berpartisipasi dalam rantai pasok dengan bisnis lainnya maupun dengan perusahaan besar dan bisnis pendukung*”), and increase the competitiveness (“*untuk meningkatkan daya saing*”), including guidance and consultation in marketing, administration, technology, including green and digital technology, and financial matters (“*bimbingan dan konsultasi terkait strategi pemasaran dan administrasi*”).

Table 3.7 Monotonicity test for direct mechanism: Preferred policy-mix of ME and MSE

θ			
ME total		MSE total	
Interaction-network & linkage	0.135	Supporting infrs. & Linkage	0.123
Interaction-network & promotion	0.116	Interaction-network & linkage	0.122
Supporting infrs. & linkage	0.110	Supporting infrs. & liquidity	0.108
Supporting infrs. & liquidity	0.095	Interaction-network & promotion	0.095
Interaction-network & Envmt.	0.083	Interaction-network & liquidity	0.094
Supporting infrs. & promotion	0.080	Supporting infrs. & promotion	0.083
Interaction-network & liquidity	0.075	Interaction-network & Envmt.	0.078
Regulation & liquidity	0.059	Supporting infrs. & Envmt.	0.055
Supporting infrs. & Envmt.	0.052	Affordable loan & Liquidity	0.049
Affordable loan & Envmt.	0.041	Affordable loan & Envmt.	0.045
Regulation & promotion	0.033	Regulation & promotion	0.035
Affordable loan & liquidity	0.030	Affordable loan & linkage	0.032
Affordable loan & linkage	0.029	Affordable loan & promotion	0.029
Regulation & Envmt.	0.022	Regulation & liquidity	0.026
Affordable loan & promotion	0.022	Regulation & Envmt.	0.014
Regulation & linkage	0.019	Regulation & linkage	0.013
θ'			
ME total		MSE total	
Interaction-network & linkage	0.121	Supporting infrs. & linkage	0.112
Interaction-network & promotion	0.112	Supporting infrs. & liquidity	0.108
Supporting infrs. & linkage	0.108	Interaction-network & promotion	0.105
Supporting infrs. & liquidity	0.096	Interaction-network & linkage	0.104
Interaction-network & Envmt.	0.090	Supporting infrs. & promotion	0.092
Supporting infrs. & promotion	0.088	Interaction-network & liquidity	0.088
Interaction-network & Liquidity	0.074	Interaction-network & Envmt.	0.073
Supporting infrs. & Envmt.	0.060	Supporting infrs. & Envmt.	0.057
Regulation & liquidity	0.058	Affordable loan & liquidity	0.044
Affordable loan & Envmt.	0.037	Affordable loan & Envmt.	0.042
Regulation & promotion	0.034	Regulation & liquidity	0.038
Affordable loan & liquidity	0.029	Regulation & promotion	0.037
Affordable loan & linkage	0.028	Affordable loan & linkage	0.030
Regulation & Envmt.	0.023	Affordable loan & promotion	0.030
Affordable loan & promotion	0.023	Regulation & Envmt.	0.023
Regulation & linkage	0.021	Regulation & linkage	0.019

ataupun hal lainnya seperti adopsi teknologi baru termasuk teknologi hijau dan digitalisasi, dan masalah keuangan”).

Looking at all the results from monotonicity tests, it is noteworthy that in every single case of our survey, both the hierarchy and the network-based, the imple-

Table 3.8 Indirect mechanism to align MSE and ME preferences under state/profile System 1 and System 2

		ME	
		L	R
MSE	U	Interaction-network & linkage	Supporting infs. & Liquidity
	D	Interaction-network & promotion	Supporting infs. & linkage

mentable SC-compatible policy is to support greater interactions through a network. For the policy-mix, the highest-ranked choice is further bolstered by the preference for linkages with other stakeholders. Even under a hypothetical case of respondents answering the questionnaire based simply on their impressions without considering the objectives and the challenges (System 1), where supporting infrastructure is the preferred choice, they tend to associate that choice with strengthening the linkages. Clearly, having a network is viewed by MSMEs as a vital step for improving their productivity because through a network they gain more interactions and better linkages among themselves and with other stakeholders.

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Chapter 4

Perceptions, Ranking Approach, and Aligning Preferences



Before proceeding, let us take stock and review what we have learned from our journey thus far.

The preceding chapters underscore the imperative of listening to MSMEs to understand their social capital. Holding the premise that MSMEs themselves are the ones who knew, felt, and experienced the conditions under which they were operating, the approach we used to capture the type, nature, and intensity of the social capital was to rely entirely on their perceptions and responses toward a set of questionnaires used in the survey. The questionnaires themselves were composed and selected based on what the MSMEs deemed important, broken down into objectives, constraints (challenges, problems), and alternatives (encapsulating the SC-compatible policies).

Using the AHP/ANP, the elements of objectives, constraints, and policies were then ranked according to what MSMEs perceived as most preferred to improve their productivity. This policy ranking was treated as the “messages” sent by agents in the MDT framework, and evaluated by the monotonicity test to address the issue of implementability. As described in the last two chapters, the results show that MSMEs overwhelmingly favored having a network with other stakeholders. The preferred pair in policy-mix also constituted having a network. After conducting the monotonicity test, these preferred policies were found implementable.

There are a number of issues relevant to the above findings that need to be clarified. First of all, to the extent the primary inputs of the model used to derive those findings were not in the form of secondary data, instead, the perceptions and judgments of MSMEs, one needs to define what constitutes perceptions and judgments. Secondly, what we did in the previous two chapters was to use the AHP/ANP-based ratio scales for conducting the MDT-based monotonicity test. To our knowledge, this study is the first to use such an approach. Most studies used either simple or other standard scales such as those based on the *Borda count*. In this context, one may wish to compare the results of this approach with those using a simple ranking that ignores the intensity of perceptions. Another major issue concerns the gap between MSMEs preferences and those of social planners’ toward policies deemed appropriate to help improve the MSMEs’ productivity. How big was the gap, and were there any

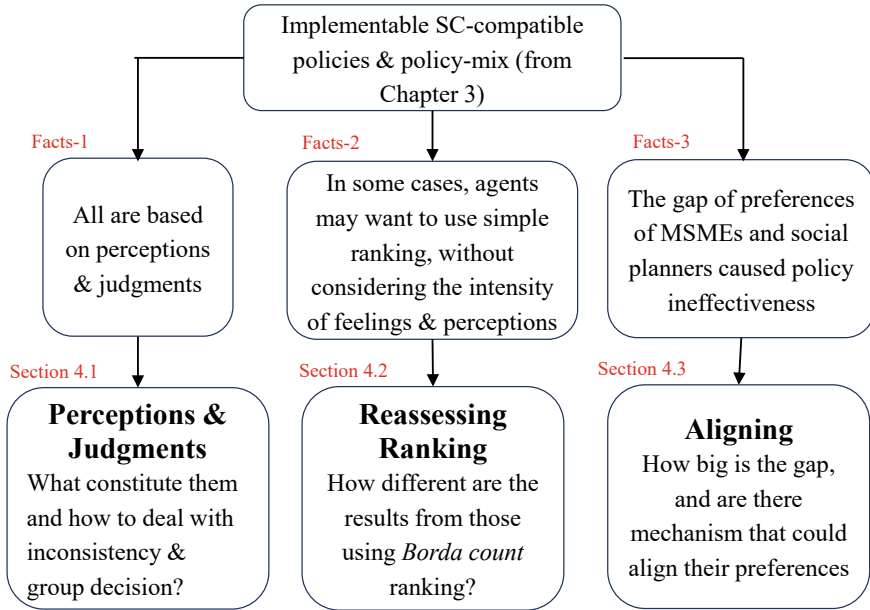


Fig. 4.1 Organization of this chapter

implementable policies or policy-mix that could align MSMEs’ and social planners’ preferences with the social choice function (SCF)? These are issues addressed in this chapter.

Figure 4.1 depicts how the chapter is organized. Before comparing the results of monotonicity test using simple *Borda*-based versus AHP/ANP-based ranking in Sect. 4.2, we begin in the next section with some important points regarding perceptions and judgments. The last section discusses the difference (gap) between the ranking of MSMEs’ preferences toward implementable policies or policy-mix and that of social planners’. This issue is important as it could explain why some of the implemented policies have not been effective. In the discussions, we also address the question of mechanism that could be used to align the different preferences and show such a mechanism.

4.1 Perceptions and Judgments

It is clear that the whole process of “listening” before arriving at the preferred policies and policy-mix began with capturing MSMEs’ perceptions as reflected in their judgments when filling in the questionnaires. Indeed, from the early stage of developing

the questionnaires to the late stage of obtaining the ranking of SC-compatible policies, we relied on MSMEs' perceptions. These perceptions played a fundamental role in our attempt to understand MSMEs' mental bandwidth.

Why judgments and perceptions are so important for preference ranking? We know that judgments and perceptions are fundamental in decision-making. Given the information that we have and the circumstances we encounter, we make decisions based on what we perceive to be the main issues and problems to be solved. Likewise, making priority ranking is based on perceptions and judgments.



Survey story: A pre-survey interview was conducted in one of the wet markets in West Jawa to ensure that any issues to be raised and questions to be asked in the follow up questionnaires reflect the real concerns to MSMEs, not what we thought are important. To capture the true feeling, perceptions and judgments of our respondents, we tried to be fully engaged in a conversation with them, without talking much. We strongly believe that we pay a particular attention on what we say when we listen. To the extent listening is a sign of respect, the way our respondents perceived respect, first and foremost, was when we did deep listening, not just waited for them to stop talking.

But what constitute perceptions and judgments, how the two are related, and how do they affect people's preferences? When we are about to make decisions or choices of some alternatives, we encounter stimuli that cause us to feel an emotion. Through a set of processes, these stimuli produce sensory impressions that take the form of sensations, from which certain information are transmitted. The process consists of a sequence of steps that involves selecting, organizing, and interpreting those information. It is this process that forms our perception. To make sense of all the stimuli, we use this process/perception.



Survey story: Most of the coffee production in Rejang Lebong, Bengkulu, is produced by smallholder farmers in rural areas, distant away from the processing industry. This made the transport and logistical costs high, and the coffee sold unprocessed. Over the last few years, their production has been significantly impacted by the climate change, for which they need information about the climate-smart cultivation techniques and better skills to deal with climate change. While this is more so for the Robusta coffee farmers, network of marketing is particularly needed for the Arabica coffee farmers (confirming that different ranking of problems implies different ranking of preferred policies)

Together with thoughts and feelings, perception constitutes the mind. It is how we take in—and make sense of—information or a situation. The way we evaluate this information to form opinions or to react is called judgment. Both perception and judgment are mental processes: the former reflects—to be followed by—the latter.

Judgments themselves can be influenced by experience, available information, and the desire to accomplish something. They also depend on our feelings and ability to interpret the information, implying that they can evolve over time depending on the learning process and changed circumstances. The comparison of survey results before and after COVID described in Chap. 3 is an example of testing the effect of changed circumstances on MSMEs’ perceptions and judgments, although after conducting the monotonicity test the preferred policy before and after COVID turned out to be the same.

The mechanism from “listening” to making the priority ranking was driven by the respondents’ thoughts and feelings, the creation of which involved both physical

and non-physical phenomena. The physical part comes from the fact that thoughts and feelings arise from the electric firings of neurons inside their brain. The brain itself is made up of energy and matter, and the firings of neurons share with the electrical vibrations, which is a physical world phenomenon. Hence, this part must obey the laws of chemistry and physics (Saaty, 2010). The communication between neurons and nervous system is facilitated by the neurotransmitters (such as serotonin and dopamine), chemical messengers that regulate behavior and judgment through various psychological functions, including mood, emotion, stress response, and cognition.¹ These functions obviously affected the way respondents answered the questionnaires in our survey.

While the brain and the firings of neurons is a physical world phenomenon, the synthesis of the firing signals produces non-physical properties not found in matter and energy of the brain. It is this synthesis where perceptions (along with thoughts, feelings, and judgments) belong to. The process of preference ranking is governed by both the physical laws of nature and the behavioral laws of psychology.

Hence, although respondents' mind originates in the organic matter of the brain, its operations must follow not only the laws of the physical world but also the principles that regulate their thoughts, feelings, and judgments. How the ranking is made depends on how respondents synthesize the signals emitted by the firings of neurons.

What if the problems we are working on contain several layers of sub-problems that are interdependent and too complex to be used for making the ranking (e.g., involving too many trade-offs)? Also, what if the components in the problems that require preference ranking are viewed differently by different respondents, each of whom answers the questionnaires with a different degree of consistency?

First is the issue of complexity arising from multiple sub-problems. Making priority ranking in a complex problem must consider all factors from different angles, each with its own result of preferences. The influences of those factors also need to be considered before combining the different preferences of each to yield the ultimate ranking. As shown in Chap. 2, this was done by developing a structure in which all relevant factors and their interdependent influences were included. Such a structure helped us understand the complexity of the problem better before we measured the relative strengths of the factors and their influences. In cases where alternative policies could influence other factors, we used a network structure as in Chap. 2 of Sect. 2.2. Otherwise, we used a hierarchy structure as in Chap. 2 of Sect. 2.3.

The second question is concerned with the group decision. To reach a consensus among members of a group is always a challenge. The "matching" between particular issues or problems that we deal with and the selected respondents who literally face those issues is critical in this context. In our case, either the owners or the operators of MSME themselves, not some proxies or third parties, were selected as direct

¹ Dopamine and serotonin are traditionally linked to reward processing. However, in a recent discovery, Bang et al. (2020) showed that based on observations in the human brain, the sub-second dopamine and serotonin have also a signaling role in non-reward-based aspects of cognition and behavior, including rapid perceptual decision processes and action.

respondents. It is our principle that they should be the ones who answered the questionnaires because they were the parties who knew, felt, and experienced the problems and issues surrounding their operations. This principle meets the prerequisite for finding a consensus in a group that requires careful consideration by members who are knowledgeable and informed about the activities they do. A cooperative decision is easier to reach when people have mutual knowledge and understanding.

As to the issue of averaging or aggregating the ranking made by a group of respondents, it is important to note at the outset that making collective decisions should ideally avoid using voting without considering the weight or intensity of respondents' feelings. The AHP/ANP approach specifically measures such weights by using the ratio scales derived from pairwise comparisons and uses them to generate the ranking. In aggregating the ranking, it has been established by many studies that the weighted geometric mean aggregation is superior to the weighted arithmetic mean and other methods of aggregation. For one, with geometric mean the reciprocal of the synthesized judgments is equal to the syntheses of the reciprocals of those judgments. Arithmetic mean does not meet such a condition. The only aggregation procedure that satisfies the AHP properties, i.e., separability, unanimity, homogeneity, and the reciprocal property, is the geometric mean (Aczel & Saaty, 1983).² It has also been shown that global priorities of alternatives obtained by the weighted geometric mean aggregation are invariant under the normalization of local priorities of alternatives and weights of criteria (Krejci & Stoklasa, 2018). Notwithstanding the foregoing conjectures, in many cases, individual respondents may not want their judgments to be combined except their final outcome. Hence, in our analysis, we only took the geometric mean of the final outcomes.

On the consistency of ranking, due to the inevitable inconsistency among the judgments (human mind is inherently inconsistent), it is necessary to derive the preference ranking that falls within an acceptable level of inconsistency. As described in Appendix B, this could be done by using the principal eigenvector of a matrix of pairwise comparisons. It is shown that such a matrix is consistent if and only if the maximum eigenvalue equals to the number of compared items ($\lambda_{max} = n$).

Another important property for consistency of judgments is related to the concept of closeness and dominance. Consider the case where we have to rank a set of policies based on their net benefits. Suppose the net benefit of policy-1 is higher than policy-2 by 5 million rupiah, and policy-2's net benefit is valued 3 million rupiah more than that of policy-3. According to metric topology, policy-1 has a greater net benefit than policy-3 by 8 million rupiah. We can also have a case where policy-1 is five times preferable than policy-2, and policy-2 is three times more preferred than policy-3. According to the topology of order, the preference toward policy-1 is 15 times larger than that toward policy-3. That is, policy-1 dominates policy-3 fifteen times. It is this dominance—rather than closeness—property that is essential for the consistency measure. Hence, we used the topology of order in our survey, which did not require any unit of measurement (dimensionless) as commonly

² Indeed, the reciprocal property plays an important role in combining the judgments of several respondents to arrive at a group's judgment (Saaty & Vargas, 2013).

used in physical sciences. From the perspective of the possibility that respondents’ preferences may change due to the emerging new information or circumstances (e.g., the COVID pandemic), allowing inconsistency is important. Continued revisions of understanding and judgments are needed as people’s experiences may change over time. There is, however, a limit to the degree of inconsistency for the survey results to be used. As explained in Appendix B, the limit is 10%. We used that limit in our survey.

4.2 Reassessing the Ranking

As discussed in Chap. 3, the two key concepts to evaluate the implementability of policy choices in MDT are the *revelation principle* and the *implementation theory*. While, in direct mechanism, we could ask/identify specifically the true state/profile of MSME and ME when revealing their preferred SC-compatible policies, in indirect mechanism the only information required are the ranking of policies. Either way, information about the ranking are needed to identify the optimal choice of policies under different state/profile.

The problem is that the resulting ranking could be different when we use different approaches. In the *Borda* count case, given alternative choices the ranking is done simply by looking at the relative position of each policy choice. Under a particular state/profile where there are four alternatives and two players ($k = 4, n = 2$), we assign four for the top-listed alternative and one for the bottom-listed alternative to one player. We do the same thing for another player. We could then select a pair of same alternatives for both players based on the largest points.

Referring to the example of an implementable case in Chap. 3 of Sect. 3.1 (reproduced below), in state/profile θ the alternative x_2 has the most points as it is ranked second by both MSE and ME. Hence, 3 is assigned for each, and the sum equals to 6 which is the highest among the sums of all pairs. Similarly, under θ' , the total sum of the assigned numbers for x_1 is the highest (6). Hence, x_1 and x_2 are the optimal choices under θ and θ' , respectively (Table 4.1).

Note that the above *Borda* count ranking ignores the intensity of each choice, something we should not do especially if we wish to capture agents’ perception

Table 4.1 Example of mechanism design: Non-violating case from Chap. 3

θ		θ'	
MSE	ME	MSE	ME
x_1	x_4	x_4	x_2
x_2	x_2	x_1	x_1
x_3	x_3	x_3	x_3
x_4	x_1	x_2	x_4

toward the importance of alternative choices. It is well known that in cases where agents are to rank pairs of alternatives, the intensity or degree of preferences matters. Thus, in quantifying and ranking perceptions before evaluating their implementability, we avoided using a simple ranking as in the *Borda* count, where respondents give a point (a number) for each choice according to their preferred order (1, 2, 3, ..., etc). Instead, we adopted an approach based on pairwise comparisons to conform with human ability to compare alternative preferences before ranking them. Through the eigenvalue-based calculation and some mathematical procedures, we transformed these pairwise inputs into ratio scales that evoked a consistent ranking of MSMEs' preferences and used it in the monotonicity test to evaluate its implementability.

All rankings we used in our study incorporate such an approach. In the survey, ME and MSE respondents revealed their intensity of preference toward one alternative over another when they disclosed their choices through pairwise comparisons, from which we derived the ranking of weights in the form of ratio scales. Obviously, there is a possibility that the eventual weights and ranking of the same case using this approach are different from those obtained from using the *Borda* count. Consequently, the results in terms of implementable policy can be different as well. The following examples show two cases using different approaches of assigning weights, one shows the same conclusions and the other gives very different conclusions.

Consider the case under one of the structural variables we used in the survey, that is, MSME with no children participation. As shown in Table 4.2, by using a

Table 4.2 Monotonicity test for direct mechanism: MSMEs With no children participation using a simple ranking approach

θ			
ME total		MSE total	
Interaction-network	6	Interaction-network	6
Supporting infrastructure	5	Supporting infrastructure	5
Regulation & legal matters	4	Regulation & legal matters	4
Facilitate information	3	Facilitate business	3
Facilitate business	2	Facilitate information	2
Financing	1	Financing	1
θ'			
ME total		MSE total	
Supporting infrastructure	6	Supporting infrastructure	6
Financing	5	Financing	5
Regulation & legal matters	4	Interaction-network	4
Interaction-network	3	Regulation & legal matters	3
Facilitate information	2	Facilitate information	2
Facilitate business	1	Facilitate business	1

Table 4.3 Monotonicity test for direct mechanism: MSMEs with no children participation using AHP/ANP-based ratio scale ranking approach

θ			
ME total		MSE total	
Interaction-network	0.254	Interaction-network	0.225
Supporting infrastructure	0.188	Supporting infrastructure	0.195
Regulation & legal matters	0.174	Regulation & legal matters	0.163
Facilitate information	0.157	Facilitate business	0.163
Facilitate business	0.139	Facilitate information	0.141
Financing	0.088	Financing	0.114
θ'			
ME total		MSE total	
Supporting infrastructure	0.247	Supporting infrastructure	0.241
Financing	0.211	Financing	0.192
Regulation & legal matters	0.170	Interaction-network	0.165
Interaction-network	0.150	Regulation & legal matters	0.163
Facilitate information	0.131	Facilitate information	0.141
Facilitate business	0.092	Facilitate business	0.098

simple ranking approach the optimum policy choice for ME under θ is “Interaction-network” (total points equal 12), while, under θ' , it is “Supporting infrastructure” (also equal 12). There is no violation of monotonicity since the relative position of “Interaction-network” falls from the first rank in θ to the fourth in θ' . Hence, “Interaction-network” policy is implementable. When using the ranking based on AHP ratio scale (Table 4.3), the optimum policy preferred by ME and MSE under θ is also “Interaction-network” (total points equal 0.479) and under θ' is “Supporting infrastructure” (0.488). For the same reasons cited above, the “Interaction-network” policy is implementable. Thus, this case shows that two different ranking approaches can give a same conclusion.

A completely different story, however, applies to a number of cases of policy-mix. Consider the case for MEs and MSEs with a relatively large number of children (above the median), for which the results from applying a simple ranking are shown in Table 4.4. If the true state/profile is θ , the optimal policy choice is “Interaction-network & Promotion” (total points equal 29), and it is “Supporting infrastructure & Linkage” under θ' (total points equal 30). The “Interaction-network & Promotion” does not violate the monotonicity condition because its rank from θ to θ' falls from the first to the third. The indirect mechanism for this case is shown in Table 4.5. On the other hand, when we used the AHP-based ranking, the monotonicity-compliant policy-mix is “Interaction-network & Linkage” since it receives the highest rank under θ and θ' (Table 4.6).

Clearly, the policy implication would have been different had we used a different ranking approach. Other than building network to strengthen interaction, resources,

Table 4.4 Monotonicity test for direct mechanism: MSMEs with a large number of children using a simple ranking approach

θ			
ME total		MSE total	
Interaction-network & Promotion	16	Interaction-network & Linkage	16
Regulation & Liquidity	15	Supporting infrs. & Linkage	15
Supporting infrs. & Liquidity	14	Supporting infrs. & Liquidity	14
Supporting infrs. & Linkage	13	Interaction-network & Promotion	13
Interaction-network & Linkage	12	Interaction-network & Liquidity	12
Supporting infrs. & Promotion	11	Supporting infrs. & Promotion	11
Interaction-network & Liquidity	10	Interaction-network & Envmnt.	10
Interaction-network & Envmnt.	9	Affordable loan & Liquidity	9
Supporting infrs. & Envmnt.	8	Affordable loan & Envmnt.	8
Regulation & Promotion	7	Supporting infrs. & Envmnt.	7
Regulation & Envmnt.	6	Regulation & Promotion	6
Affordable loan & Envmnt.	5	Affordable loan & Promotion	5
Regulation & Linkage	4	Affordable loan & Linkage	4
Affordable loan & Linkage	3	Regulation & Liquidity	3
Affordable loan & Liquidity	2	Regulation & Envmnt.	2
Affordable loan & Promotion	1	Regulation & Linkage	1
θ'			
ME total		MSE total	
Interaction-network & Linkage	16	Supporting infrs. & Liquidity	16
Supporting infrs. & Linkage	15	Supporting infrs. & Linkage	15
Supporting infrs. & Promotion	14	Interaction-network & Promotion	14
Interaction-network & Promotion	13	Interaction-network & Linkage	13
Interaction-network & Envmnt.	12	Interaction-network & Liquidity	12
Regulation & Liquidity	11	Supporting infrs. & Promotion	11
Supporting infrs. & Envmnt.	10	Interaction-network & Envmnt.	10
Supporting infrs. & Liquidity	9	Supporting infrs. & Envmnt.	9
Interaction-network & Liquidity	8	Affordable loan & Liquidity	8
Regulation & Promotion	7	Affordable loan & Envmnt.	7
Affordable loan & Envmnt.	6	Affordable loan & Linkage	6
Regulation & Envmnt.	5	Regulation & Promotion	5
Affordable loan & Linkage	4	Regulation & Liquidity	4
Regulation & Linkage	3	Affordable loan & Promotion	3
Affordable loan & Liquidity	2	Regulation & Envmnt.	2
Affordable loan & Promotion	1	Regulation & Linkage	1

and attention would be directed toward promotion if we neglected the intensity of MSME perception about the importance of policy-mix for productivity improvements. Yet, having a linkage that reflects the quality of interaction or network is more important for productivity improvement. More interaction and network do not

Table 4.5 Indirect mechanism to align MSE and ME preferences with SCF for the case of no children participation

		ME	
		L	R
MSE	U	Interaction-network & Promotion	Interaction-network & Linkage
	D	Interaction-network & Linkage	Supporting infras. & Linkage

always result in a better outcome. The quality that could improve the effectiveness of the network and interaction matters more.

4.3 SC-Compatible Policies and Policy-Mix of Social Planners and MSME

In Chap. 2, we devoted our analysis to finding SC-compatible policies and policy-mix that are implementable. That analysis was made based on the results of our survey in which MEs and MSEs have their own preference ranking to achieve productivity improvements. We also showed the mechanism for those policies under limited information, that is, without knowing the true state/profile of MSE and ME. Yet, with all the information and institutional capacity they had accumulated over the years, social planners may have some knowledge and experience to select and implement policies or policy-mix. Decades of experience with successes and failures must have led to the improved set of policies. The types of the implemented government policies and how they evolved over the years allowed us to synthesize the social planners’ preferred choices of policy. Based upon those choices, we could construct the ranking to reflect the social planners’ point of view with respect to policy preferences.³

In this context, we wish to explore the compatibility of preferences of social planners, MEs, and MSEs. Given that their preferences may be different, to what extent those preferences can coincide with each other? Which preferred policies and policy-mix are implementable, and what mechanisms can be designed for such policies? In view of what we discussed in the preceding section about employing different ranking approaches, would any implementable policies or policy-mix be different in this case?

By applying similar methods as we used for ME and MSE, Tables 4.7, 4.8, and 4.9 show the resulting ranking of SC-compatible policies according to the following three pairs: social planners and MSME, social planners and ME, and social planners and MSE, respectively.

There are clearly some ranking gaps between the social planners’ choice and what the MSMEs prefer. If improving productivity is the goal, the former tends to

³ The list and evolution of government policies directed to help MSMEs since the 1960s were discussed in Chap. 2 of Section “Policy Measures” of our previous study (Azis, 2022).

Table 4.6 Monotonicity test for direct mechanism: MSMEs with a large number of children using AHP/ANP-based ratio scale ranking approach

θ			
ME total		MSE total	
Interaction-network & Promotion	.105	Interaction-network & Linkage	.124
Regulation & Liquidity	.098	Supporting infrs. & Linkage	.102
Supporting infrs. & Liquidity	.097	Supporting infrs. & Liquidity	.100
Supporting infrs. & Linkage	.091	Interaction-Network & Promotion	.098
Interaction-network & Linkage	.090	Interaction-Network & Liquidity	.090
Supporting infrs. & Promotion	.082	Supporting infrs. & Promotion	.071
Interaction-network & Liquidity	.075	Interaction-Network & Envmt.	.069
Interaction-network & Envmt.	.062	Affordable loan & Liquidity	.066
Supporting infrs. & Envmt.	.060	Affordable loan & Envmt.	.056
Regulation & Promotion	.052	Supporting infrs. & Envmt.	.047
Regulation & Envmt.	.048	Regulation & Promotion	.043
Affordable loan & Envmt.	.036	Affordable loan & Promotion	.039
Regulation & Linkage	.034	Affordable loan & Linkage	.039
Affordable loan & Linkage	.026	Regulation & Liquidity	.027
Affordable loan & Liquidity	.025	Regulation & Envmt.	.017
Affordable loan & Promotion	.019	Regulation & Linkage	.012
θ'			
ME total		MSE total	
Interaction-network & Linkage	.116	Supporting infrs. & Liquidity	.109
Supporting infrs. & Linkage	.106	Supporting infrs. & Linkage	.101
Supporting infrs. & Promotion	.091	Interaction-network & Promotion	.097
Interaction-network & Promotion	.088	Interaction-network & Linkage	.094
Interaction-network & Envmt.	.086	Interaction-network & Liquidity	.086
Regulation & Liquidity	.079	Supporting infrs. & Promotion	.086
Supporting infrs. & Envmt.	.077	Interaction-network & Envmt.	.064
Supporting infrs. & Liquidity	.076	Supporting infrs. & Envmt.	.062
Interaction-network & Liquidity	.061	Affordable loan & Liquidity	.059
Regulation & Promotion	.053	Affordable loan & Envmt.	.051
Affordable loan & Envmt.	.041	Affordable loan & Linkage	.039
Regulation & Envmt.	.032	Regulation & Promotion	.039
Affordable loan & Linkage	.030	Regulation & Liquidity	.036
Regulation & Linkage	.026	Affordable loan & Promotion	.035
Affordable loan & Liquidity	.022	Regulation & Envmt.	.024
Affordable loan & Promotion	.018	Regulation & Linkage	.016

prioritize the need for “Financing,” but MSMEs do not think so. For MSMEs, the three top priorities are: having “Interaction-network” getting “Supporting infrastructure,” and resolving the problems surrounding “Regulation & Legal matters.” Clearly, this reflects the gap between social planners’ intention and what MSMEs need. It partly

Table 4.7 Summarized ranking of policy preferences of social planners and MSME

		Social planner	MSME
Alternatives: SC-compatible	Facilitate information	0.096	0.144
	Facilitate business	0.115	0.151
	Financing	0.271	0.106
	Interaction-network	0.261	0.232
	Regulation & legal matters	0.047	0.171
	Supporting infrastructure	0.209	0.195

Table 4.8 Summarized ranking of policy preferences of social planners and ME

		Social planner	ME
Alternatives: SC-compatible	Facilitate information	0.113	0.155
	Facilitate business	0.168	0.140
	Financing	0.186	0.093
	Interaction-network	0.296	0.239
	Regulation & legal matters	0.050	0.185
	Supporting infrastructure	0.187	0.187

Table 4.9 Summarized ranking of policy preferences of social planners and MSE

		Social planner	MSE
Alternatives: SC-compatible	Facilitate information	0.136	0.138
	Facilitate business	0.152	0.161
	Financing	0.263	0.115
	Interaction-network	0.232	0.228
	Regulation & legal matters	0.054	0.163
	Supporting infrastructure	0.162	0.196

explains why some programs were not effective, having a low participation rate, or beset by problems of corruption (Berry et al., 2001; Musa & Pritana, 1998; Hill, 2001; Sandee et al., 1994; Tambunan, 2007). When MSME is broken down into ME and MSE, the top priority remains having “Interaction-network.” Interestingly, based on all the information we gathered, the social planners’ choice for “Interaction-network” is at the top priority only for MEs. For MSEs, social planners tend to believe that providing support of “Financing” is the most important measure to take.

In terms of policy-mix, some gaps are also detected. For the overall MSMEs, the gap is again in the area related to finance. More specifically, “Affordable loan & Liquidity” was prioritized by social planners especially for MSEs, while, for MSMEs, the priority according to them should be on “Interaction-network & Linkage requirement.” The list of the ranking of SC-compatible policy-mix for MSME, ME, and MSE are shown in Tables 4.10, 4.11, and 4.12, respectively.

Table 4.10 Summarized ranking of policy-mix preferences of social planners and MSME

Hierarchy component	Social planner	MSMEs	
SC-compatible joint policies	<i>Interaction-network</i>		
	Promotion	0.029	0.103
	Liquidity	0.086	0.087
	Environment	0.020	0.080
	Linkage requirement	0.097	0.127
	<i>Affordable Loan</i>		
	Promotion	0.086	0.026
	Liquidity	0.205	0.041
	Environment	0.006	0.044
	Linkage requirement	0.121	0.031
	<i>Regulation</i>		
	Promotion	0.026	0.035
	Liquidity	0.103	0.036
	Environment	0.020	0.017
	Linkage requirement	0.075	0.015
	<i>Supporting infrastructure</i>		
	Promotion	0.024	0.083
	Liquidity	0.043	0.103
	Environment	0.013	0.054
	Linkage requirement	0.046	0.119

Table 4.11 Summarized ranking of policy-mix preferences of social planners and ME

Hierarchy component	Social planner	MEs	
SC-compatible joint policies	<i>Interaction-network</i>		
	Promotion	0.016	0.116
	Liquidity	0.044	0.075
	Environment	0.020	0.083
	Linkage requirement	0.084	0.135
	<i>Affordable Loan</i>		
	Promotion	0.078	0.022
	Liquidity	0.121	0.030
	Environment	0.008	0.041
	Linkage requirement	0.253	0.029
	<i>Regulation</i>		
	Promotion	0.037	0.033
	Liquidity	0.091	0.059
	Environment	0.017	0.022
	Linkage requirement	0.134	0.019
	<i>Supporting infrastructure</i>		
	Promotion	0.019	0.080
	Liquidity	0.027	0.095
	Environment	0.010	0.052
	Linkage requirement	0.040	0.110

Table 4.12 Summarized ranking of policy-mix preferences of social planners and MSE

Hierarchy component	Social planner	MSEs
SC-compatible joint policies		
	<i>Interaction-network</i>	
	Promotion	0.028
	Liquidity	0.102
	Environment	0.022
	Linkage requirement	0.048
	<i>Affordable Loan</i>	
	Promotion	0.085
	Liquidity	0.231
	Environment	0.008
	Linkage requirement	0.135
	<i>Regulation</i>	
	Promotion	0.025
	Liquidity	0.101
	Environment	0.021
	Linkage requirement	0.067
	<i>Supporting infrastructure</i>	
	Promotion	0.025
	Liquidity	0.044
	Environment	0.012
	Linkage requirement	0.045

Given those gaps, we are interested to find out whether it is possible to find a common ground between social planners and ME and MSE such that some implementable policies and policy-mix can be found. If it is, will the ranking of those policies and policy-mix be different had ME and MSE responded to the questionnaire without considering the objectives and the challenges (in their System 1)? More importantly, what would be the mechanism that could lead to the incentive-compatible outcome for ME, MSE, and social planners?

As shown in Tables 4.8 and 4.9 earlier, when social planners’ preference is paired with that of MEs and MSEs individually, the priority ranking is different from that revealed by the ME-MSE pair. Recall that the optimal and implementable policy for the ME-MSE pair was “Interaction-network” and “Supporting infrastructure” under θ and θ' . For the pair of social planners and ME, the optimal and implementable policy is “Interaction-network” in both θ and θ' , the weight sum of which is 0.535 (0.239 + 0.296) and 0.458 (0.162 + 0.296), respectively (Table 4.13). For the pair of social planners and MSE, the implementable policy in θ and θ' is different: “Interaction-network” in the former and “Financing” in the latter. Table 4.15 displays the corresponding mechanism. Consistent with the ranking shown in Table 4.14, social planners were clearly more inclined to think that MSEs need more funding than anything else, which was in contrast to what MEs and MSEs preferred when the social planners were not included.

Table 4.13 Monotonicity test for direct mechanism: Policies for ME and social planners

θ			
ME		Social planner	
Interaction-network	0.239	Interaction-network	0.296
Supporting infrastructure	0.187	Supporting infrastructure	0.187
Regulation & legal matters	0.185	Financing	0.186
Facilitate information	0.155	Facilitate business	0.168
Facilitate business	0.140	Facilitate information	0.113
Financing	0.093	Regulation & legal matters	0.050
θ'			
ME		Social planner	
Supporting infrastructure	0.244	Interaction-network	0.296
Financing	0.203	Supporting infrastructure	0.187
Regulation & legal matters	0.166	Financing	0.186
Interaction-network	0.162	Facilitate business	0.168
Facilitate information	0.132	Facilitate information	0.113
Facilitate business	0.093	Regulation & legal matters	0.050

Table 4.14 Monotonicity test for direct mechanism: Policies for MSE and social planners

θ			
MSE		Social planner	
Interaction-network	0.228	Financing	0.263
Supporting infrastructure	0.196	Interaction-network	0.232
Regulation & legal matters	0.163	Supporting infrastructure	0.162
Facilitate business	0.161	Facilitate business	0.152
Facilitate information	0.138	Facilitate information	0.136
Financing	0.115	Regulation & legal matters	0.054
θ'			
MSE		Social planner	
Supporting infrastructure	0.243	Financing	0.263
Financing	0.193	Interaction-network	0.232
Regulation & legal matters	0.161	Supporting infrastructure	0.162
Interaction-network	0.158	Facilitate business	0.152
Facilitate information	0.145	Facilitate information	0.136
Facilitate business	0.100	Regulation & legal matters	0.054

Table 4.15 Indirect mechanism to align MSE and social planners' preferences with SCF

		Social planners	
		L	R
MSE	U	Interaction-network	Supporting infrastructure
	D	Facilitate business	Financing

Next is for the policy-mix. Based on the resulting ranking shown in Tables 4.16 and 4.17, the implementable policies in the case of social planners versus ME and social planners versus MSE are different. In the former (Table 4.16), “Affordable loan & Linkage” is the implementable measure under both θ and θ' with the weight

Table 4.16 Monotonicity test for direct mechanism: Policy-mix for ME and social planners

θ			
MSE		Social planner	
Interaction-network & Linkage	.135	Affordable loan & Linkage	.253
Interaction-network & Promotion	.116	Regulation & Linkage	.134
Supporting infrs. & Linkage	.110	Affordable loan & Liquidity	.121
Supporting infrs. & Liquidity	.095	Regulation & Liquidity	.091
Interaction-network & Envmt.	.083	Interaction-network & Linkage	.084
Supporting infrs. & Promotion	.080	Affordable loan & Promotion	.078
Interaction-network & Liquidity	.075	Interaction-network & Liquidity	.044
Regulation & Liquidity	.059	Supporting infrs. & Linkage	.040
Supporting infrs. & Envmt.	.052	Regulation & Promotion	.037
Affordable loan & Envmt.	.041	Supporting infrs. & Liquidity	.027
Regulation & Promotion	.033	Interaction-network & Envmt.	.020
Affordable loan & Liquidity	.030	Supporting infrs. & Promotion	.019
Affordable loan & Linkage	.029	Regulation & Envmt.	.017
Regulation & Envmt.	.022	Interaction-network & Promotion	.016
Affordable loan & Promotion	.022	Supporting infrs. & Envmt.	.010
Regulation & Linkage	.019	Affordable loan & Envmt.	.008
θ'			
MSE		Social planner	
Interaction-network & Linkage	.121	Affordable loan & Linkage	.255
Interaction-network & Promotion	.112	Regulation & Linkage	.123
Supporting infrs. & Linkage	.108	Affordable loan & Liquidity	.112
Supporting infrs. & Liquidity	.096	Regulation & Liquidity	.090
Interaction-network & Envmt.	.090	Affordable loan & Promotion	.080
Supporting infrs. & Promotion	.088	Supporting infrs. & Linkage	.065
Interaction-network & Liquidity	.074	Regulation & Promotion	.045
Supporting infrs. & Envmt.	.060	Interaction-network & Linkage	.044
Regulation & Liquidity	.058	Supporting infrs. & Liquidity	.043
Affordable loan & Envmt.	.037	Supporting infrs. & Promotion	.032
Regulation & Promotion	.034	Affordable loan & Envmt.	.032
Affordable loan & Liquidity	.029	Interaction-network & Liquidity	.023
Affordable loan & Linkage	.028	Regulation & Envmt.	.021
Regulation & Envmt.	.023	Supporting infrs. & Envmt.	.018
Affordable loan & Promotion	.023	Interaction-network & Envmt.	.011
Regulation & Linkage	.021	Interaction-network & Promotion	.008

Table 4.17 Monotonicity test for direct mechanism: Policy-mix for MSE and social planners

θ			
MSE		Social planner	
Supporting infrs. & Linkage	.123	Affordable loan & Liquidity	.231
Interaction-network & Linkage	.122	Affordable loan & Linkage	.135
Supporting infrs. & Liquidity	.108	Interaction-network & Liquidity	.102
Interaction-network & Promotion	.095	Regulation & Liquidity	.101
Interaction-network & Liquidity	.094	Affordable loan & Promotion	.085
Supporting infrs. & Promotion	.083	Regulation & Linkage	.067
Interaction-network & Envmt.	.078	Interaction-network & Linkage	.048
Supporting infrs. & Envmt.	.055	Supporting infrs. & Linkage	.045
Affordable loan & Liquidity	.049	Supporting infrs. & Liquidity	.044
Affordable loan & Envmt.	.045	Interaction-network & Promotion	.028
Regulation & Promotion	.035	Supporting infrs. & Promotion	.025
Affordable loan & Linkage	.032	Regulation & Promotion	.025
Affordable loan & Promotion	.029	Interaction-network & Envmt.	.022
Regulation & Liquidity	.026	Regulation & Envmt.	.021
Regulation & Envmt.	.014	Supporting infrs. & Envmt.	.012
Regulation & Linkage	.013	Affordable loan & Envmt.	.008
θ'			
MSE		Social planner	
Supporting infrs. & Linkage	.112	Affordable loan & Liquidity	.216
Supporting infrs. & Liquidity	.108	Affordable loan & Linkage	.128
Interaction-network & Promotion	.105	Regulation & Liquidity	.101
Interaction-network & Linkage	.104	Affordable loan & Promotion	.086
Supporting infrs. & Promotion	.092	Supporting infrs. & Liquidity	.074
Interaction-network & Liquidity	.088	Supporting infrs. & Linkage	.071
Interaction-network & Envmt.	.073	Regulation & Linkage	.068
Supporting infrs. & Envmt.	.057	Interaction-network & Liquidity	.052
Affordable loan & Liquidity	.044	Supporting infrs. & Promotion	.042
Affordable loan & Envmt.	.042	Regulation & Promotion	.031
Regulation & Liquidity	.038	Affordable loan & Envmt.	.031
Regulation & Promotion	.037	Regulation & Envmt.	.026
Affordable loan & Linkage	.030	Interaction-network & Linkage	.025
Affordable loan & Promotion	.030	Supporting infrs. & Envmt.	.022
Regulation & Envmt.	.023	Interaction-network & Promotion	.015
Regulation & Linkage	.019	Interaction-network & Envmt.	.011

sums equal to 0.282 and 0.283, respectively, while, in the latter (Table 4.17), it is a policy-mix of “Affordable loan & Liquidity” (0.280 in θ and 0.260 in θ').

The use of different ranking techniques once again is shown to produce different results. When the process of finding SC-compatible policies and policy-mix is applied

to a case involving social planners, we have shown that in some cases (e.g., MSMEs with no children participation) the resulting implementable policies can be the same, but in others (e.g., MSMEs with large number of children) they are very different. The implications on policy measure are very important in that the repercussions on resource allocation can be sub-optimal. In particular, a considerable amount of resources would have been unwisely spent on promotion had the intensity of MSMEs' perception toward policy-mix been ignored. According to our analysis, in such a particular case the focus of policy intervention ought to be directed instead toward providing the supporting infrastructure to help establish and strengthen a network that could help MSMEs to interact among themselves and with other stakeholders.

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Chapter 5

Financing Gap and Digitalization



Now that identifying the most preferred and implementable SC-compatible policies is done, we wish to discuss two issues frequently emphasized by analysts, social planners, and international organizations as very important contributors to the MSME performance: financing and digitalization. Our survey also included these two issues, although, from the MSMEs' perspective, they were not the key, at least not as stand-alone factors, that caused the low productivity. The two, however, could affect the extent and quality of networking, that the majority of MSMEs are considered most important for productivity improvements.

We begin this chapter by delving into the issue of financing gap, one of the universally recognized impediments for MSMEs to grow. After describing the trends and extent of financing gap in Indonesia, we investigate whether the country's low level of MSME credit was due to supply constraints or driven by a lack of demand. One form of finances that could potentially help MSME involved in international trade is "trade finance." To the extent exporting activities can help improve the business efficiency and productivity, a large gap in trade finance faced by MSMEs is concerning. This issue is discussed in the subsequent section.

The three sections that follow are on digitalization. The relation between digitalization and financing gap is first discussed, in which the direct and indirect effect of digitalization to reduce financing gap is highlighted. This is followed by the role of "fintech" and digital payment. Like, in the case of any new technology, the introduction of "fintech" and other digitization in finance has attracted a lot of attention as a potential solution to help MSME financing needs. Theoretically, the problem of financing gap can be mitigated by adopting the digital technology. This has led social planners in many countries, including Indonesia, to intensify efforts to accelerate economic digitalization transformation. For MSMEs, however, there are a number of obstacles to achieve such a goal. Although the increasing use of digital payments and online marketing during COVID was encouraging, its sustainability remains in question. Extra efforts are needed if we expect more MSMEs going digital. Since there is always a possibility for potential users and MSMEs to oppose, reject, or postpone the use of digital technology, we discuss this issue toward the end of the section.

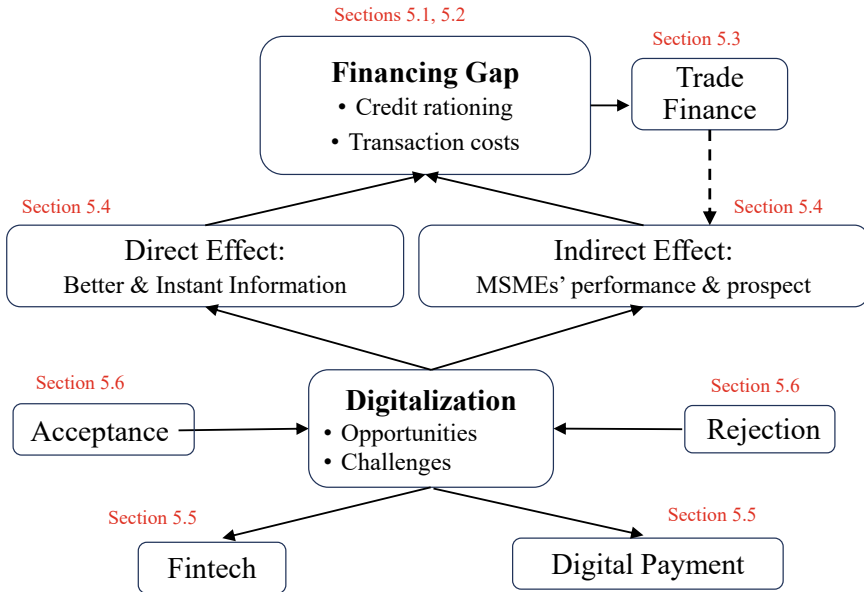


Fig. 5.1 Organization of this chapter

The organization of the chapter is depicted in Fig. 5.1. In Sects. 5.1 and 5.2, we discuss the extent and the trend of financing gap in Indonesia, followed by the analysis about the role of credit rationing and transaction costs in causing such a gap. Section 5.3 provides some brief discussions on trade finance, a type of credit critically needed for MSMEs to conduct exports-imports, yet is among those that suffer a significant gap. The direct and indirect effects of digitalization on narrowing financing gap are discussed in Sect. 5.4. The indirect channel works through the improved performance of MSMEs, where digitalization enhances the efficiency and productivity such that banks and other lenders are more willing to extend credit to them. Since improved efficiency can also be attained through exports, for which trade finance plays a vital role, there is an indirect mechanism that connects trade finance and efficiency (dotted line in Fig. 5.1). Section 5.5 covers the role and use of fintech and digital payment in affecting MSMEs’ performance, and Sect. 5.6 is devoted to the discussions on why some MSMEs are willing to use new techniques including digital technology, while others are not.

5.1 Extent and Trends of Financing Gap in Indonesia

Like in many countries, Indonesian MSMEs face similar challenges in accessing finance from banks and other lenders. In delving into this issue, we used secondary data and utilized a particular model to uncover the relative strength of variables

that reflect the demand and supply side of credits allocated to MSMEs. Another frequently discussed issue during the last few years is the use of digitalization. With the advent of COVID-19 and the global pandemic, more and more consumers and businesses including MSMEs are converting to the digital environment. Was such a trend cyclical or structural? What are the opportunities and impediments to using digital technology for MSMEs?

Financing gap refers to the lack of funding available from the financial sector. It is a phenomenon that could have major repercussions on the development finance and performance in any country. Indeed, access to financial services has been identified as a key enabler for many of the Sustainable Development Goals (SDGs) unanimously adopted by all members of the United Nations in 2015 to end poverty, protect the planet, and ensure prosperity for all.

A lack of access continues to be one of the major problems faced by MSMEs around the world. Some MSMEs are viewed too large to be served by institutions like microfinance, but too small and high-risk to be attractive to the formal financial institutions. “Missing middle” is the popularly known term for such a condition. The sources of finance for MSMEs can be bank credit/loan, equity financing, fintech-type, and various forms of informal financing without a formal financial intermediary. The latter is prevalent in countries with less developed financial markets and intermediaries, including but not restricted to, funding from family, friends, relatives, pawnshops, community cooperatives, and trade credit. There is also a large number of self-financed MSMEs.

Financing gap in MSMEs has become a classic story everywhere. It often associates with a lack of access to finance with obstacles to growth or sales (Ayyagari et al., 2008; Banerjee & Duflo 2014). While the precise degree of financing gap and the above association varies across countries, Indonesia is among those with notable characteristics. From the multi-country information, the IFC/World Bank database shows that among 132 countries Indonesia was recorded as one of the top 5 economies with the highest density (number of MSMEs per 1,000 people), yet having the lowest lending/GDP ratio (Fig. 5.2). Although the information were based on August 2010 data and only covered the formal registered MSMEs with the usual caveats about the definition and data quality, such a relative position warrants a closer look.¹ A follow-up publication by the IFC/World Bank in December 2014 covering 155 economies continued to put Indonesia among countries with highest percentage—over 60%—of SMEs unserved by credit institutions, while the density fell from the level in 2010; see Fig. 5.3 (Ariel et al., 2014).

The data set produced by Bank Indonesia shows a slight distinction compared to the World Bank data: credit for MSME as a percentage of GDP is recorded slightly higher than what is depicted in Fig. 5.2. In 2010, the recorded number was 5.7%. It

¹ The IFC data set from “MSME Country Indicators” covering 125 million formal MSMEs in 132 countries was an expansion from the January 2007 “Micro, Small, and Medium Enterprises: A Collection of Published Data.” The summarized analysis of it is discussed in Kushnir et al. (2010).

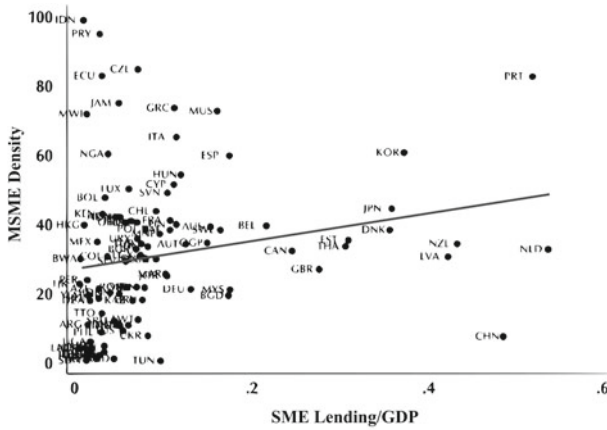
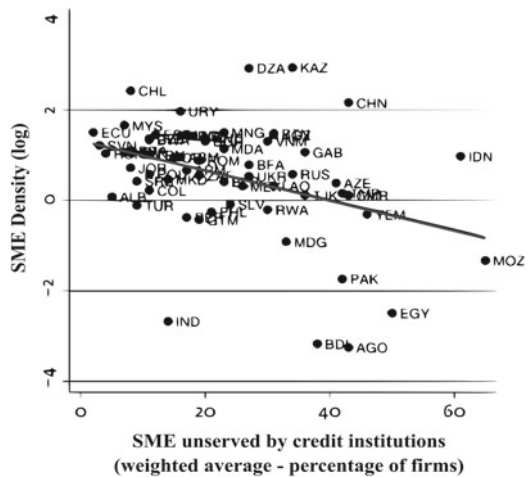


Fig. 5.2 MSME density and lending/GDP in 2010. *Source* Reproduced from Kushnir et al. (2010). *Note* IDN = Indonesia

Fig. 5.3 SME density and those unserved by credit institutions in 2014. *Source* Reproduced from Ariel et al. (2014). *Note* IDN = Indonesia



increased slightly to 7.2% during COVID but declined again to 6.9% in 2022. As a proportion to total credit, the number is hovering around 20% albeit falling since 2010 and rising only since 2018 (the right y-axis of Fig. 5.4). Looking at its distribution, the share received by micro and small enterprises increased slightly from 1.1 and 2.1% of GDP in 2011 to 2.7 and 2.4% in 2022, respectively (Fig. 5.5). Clearly, from all available information, the amount of credits allocated to MSME in Indonesia has been much lower than in most other countries, confirming the country’s position depicted in Fig. 5.2. Was the low credit due to a lack of demand or a lack of supply (lenders’ unwillingness to lend and/or credit rationing)?

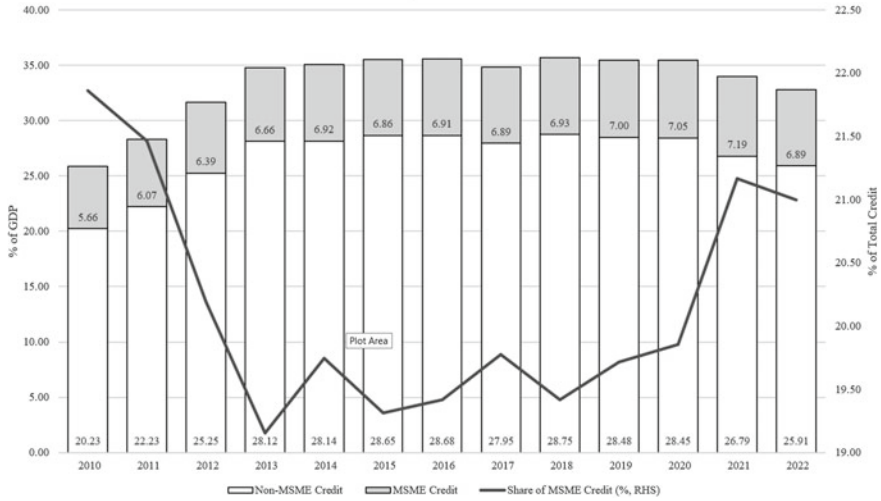


Fig. 5.4 MSME credit in Indonesia. *Source* Department of MSME Development and Consumer Protection, Bank Indonesia

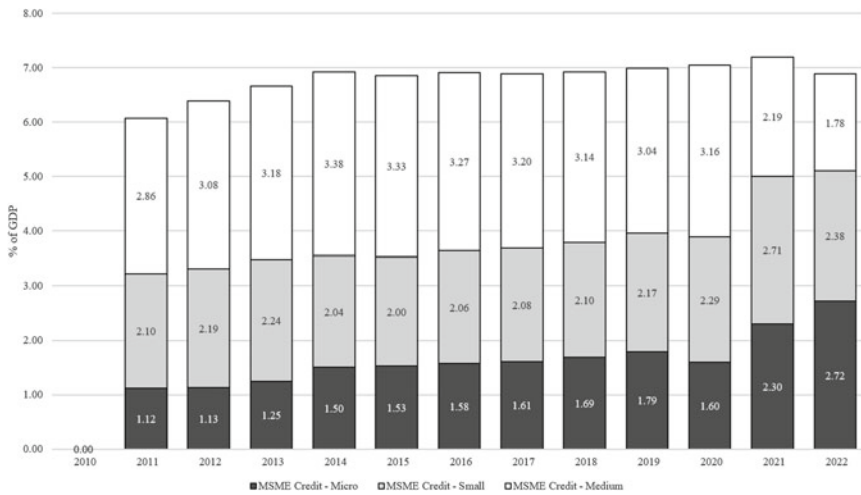


Fig. 5.5 MSME credit by borrowers' size. *Source* Department of MSME Development and Consumer Protection, Bank Indonesia

5.2 Credit Rationing

As cited earlier, financing gap refers to the lack of funding available from the financial sector. How do we measure it? Obviously, we need to compare the estimated demand for credit and the available supply of it. Even if can assume a certain level of supply

based on the past trend, the demand side is more difficult to predict as it may fluctuate depending on the economic conditions and other factors. The International Finance Corporation and World Bank (2017) made such estimates, denoting it by “potential demand,” based upon which the financing gap in Indonesia was estimated at 19% of GDP or around 293% of the current level of credit. Breaking down the MSME into two groups, “micro” (the unit number of which was slightly over 1% of total MSME) and “small and medium,” and categorizing their financial access conditions into “fully constrained,” “partly constrained,” and “unconstrained,” the percentage numbers for the “micro” group were 22%, 30%, and 48%, and for the “small and medium” group were 18%, 31%, and 52%, respectively.

An alternative way of evaluating the financing gap is by comparing the estimated demand with the estimated supply of credit using a disequilibrium model. In what follows, we discuss the results of using such a model in the Indonesian case.

In a standard credit channel model, contractionary (expansionary) policy affects the economy through a decline (an increase) in banks’ supply of funds. The ups and downs of lending terms include changes in both, loan pricing and the quantities of credit available to borrowers. In its original version, such a model masks the real effect of asymmetric information that can cause a phenomenon known as “credit rationing.” The concept of credit rationing is highly relevant for the analysis of financing gap faced by MSMEs and other businesses, to the extent that it could influence the effect of the transmission of monetary policy on the economy (Blinder & Stiglitz, 1983).

In finance literature, the existence of asymmetric information between borrowers and lenders is key for understanding the phenomenon of credit rationing. It helps explain why given an interest rate there are cases where demand for credit exceeds supply.² Some borrowers are completely rationed out of the market even though they would be willing to pay an interest rate higher than that prevailing in the market. In such a setting, the interest rate failed to clear excess demand in the loan market. At the equilibrium interest rate, either every potential MSME borrower received a loan smaller than desired, or they were completely rationed out of the market. From the demand side, MSMEs within a given group are often charged the same interest rate even though banks know that they are different (with some effort banks could actually distinguish those differences). Some also argued that regulation, not just informational problems, can also distort credit markets.

Not until the 1970s when the information economics revolution began that a more complete argument on credit rationing was made. Beginning with the work on adverse selection by Akerlof (1970) and the explicit treatment of asymmetric information in general by Jaffee and Russell (1976) the notion that credit pooling could emerge was characterized by high-quality borrowers preferring a contract that entails a slightly lower interest rate with a reduced loan amount. But it was the work of Stiglitz and

² Early discussions of credit rationing viewed it as a non-equilibrium phenomenon due to a lack of competition in the loan market and rigidities in (or a slow to adjust) interest rate; e.g., McKinnon (1970)’s and Shaw (1973)’s argument on financial repression. However, since the work of Hodgman (1960) the phenomenon of equilibrium credit rationing actually has already begun to receive some attention, most of which put the emphasis on a mechanism whereby lenders evaluate potential borrowers on the basis of the loans’ expected return-expected loss ratio.

Weiss (1981) that dealt for the first time with the problem of equilibrium instability. They did so by endogenizing contract choices with a stable, rationing equilibrium. In their model, the lenders' expected return is not monotonically increasing in the interest rate due to adverse selection (lenders' payoff is concave because of limited liability upon default) or moral hazard problems (borrowers' profit function is convex).

Two main channels are at work. First, a higher interest rate is viewed as a higher risk, causing borrowers to prefer riskier project that has a higher probability of default, while lenders prefer the safer project. Secondly, and more indirectly, rising interest rates will lower the average quality of the lenders' applicant pool (adverse selection) and thereby lenders' expected return, outweighing the benefits of the first effect of interest rate increase.³ As a result, lenders will not raise the interest rate beyond where the adverse selection effect dominates. If excess demand exists at that rate, credit rationing will be the choice (the equilibrium). These two channels may cause non-monotonicity of lenders' return that eventually leads to credit rationing. Suggested implicitly by this concept is that, the condition of banks' balance sheet and the lending channel can affect credit supply, while credit demand is affected by the firms' balance sheet and the borrowing channel (Adrian & Shin, 2010; Bernanke et al., 1996). The point is, in analyzing credit rationing and financing gap the interest rate is not the only factor determining credit. To the extent the majority of MSMEs in most countries are bank-dependent, the concept of credit rationing is critical in the analysis.



Survey story: Rural traders in a traditional market in Magelang, Central Jawa. Even though the size of credit they need is small, the number of unit of micro business across the country is huge (more-than 98% of total MSME), and the overall sum of bank's credit allocated to retail trade sector is not small (close to 7% of all MSME credits). On the other hand, because of their small size, lack of collateral, and viewed by lenders as risky, involving high transaction costs, getting credit approval is not easy for this type of micro business

³ Borrowers with good credit risk voluntarily drop out of the market not because they are rationed out but, because for them, the cost of being pooled with higher-risk borrowers is too great. On the other hand, higher-risk borrowers who are rationed tend to stay in the market.

Like in many countries, a large number of MSMEs in Indonesia are completely rationed out of the market even though they can and are willing to pay an interest rate higher than that prevailing in the market. At the time of writing, the prevailing market rate for lending is between 8 and 9%, and the well-known *Kredit Usaha Rakyat* (KUR) rate is 6%. Yet, given the MSME density (very high) Indonesia was ranked among the lowest in terms of SME lending/GDP. Higher lending rates not inducing higher credit is one indication of the presence of credit rationing.

Some argued that low lending for small businesses can be due to informal financing based on social networks that involve an altruistic relationship (Lee & Persson, 2016). Others argued that the recorded low lending is because of the limited coverage and a lack of reliable data. But the fact that the information were taken from multi-country data suggests that the case of Indonesia is indeed rather unique, and hence warrants a separate analysis of credit rationing. The need for such an analysis gains even more strength when there is a crisis like the COVID pandemic. It is therefore of significance to assess the credit and borrowing conditions of MSMEs before and during the pandemic. Of particular interest is the question whether the reduction in lending was caused by the demand-side or the supply-side factors. By using a disequilibrium model, we used two sets of data: macro data covering all MSME lending, and micro data comprising of sample of MSMEs in the SKLU business survey conducted by the DUPK of Bank Indonesia (*Survei Laporan Keuangan UMKM, Departemen Pengembangan UMKM dan Perlindungan Konsumen*). The model takes into account the existence of credit rationing, reflected in a permanent credit market disequilibrium:

$$\text{Demand : } L_t^d = \beta_1 x_{1t} + u_{1t}$$

$$\text{Supply : } L_t^s = \beta_2 x_{2t} + u_{2t}$$

$$L_t = \min(L_t^d, L_t^s)$$

The first equation denotes credit or loan demand, the second is loan supply, and the third indicates whether the observed credit allocation to MSMEs is constrained more by loan supply or loan demand. Applying to macro data, MSMEs' demand for loan L_t^d is determined by a set of exogenous variables consisting of lending rate for working capital (r_{wc}) and real GDP (y), whereas, in the loan supply equation, the supply of loan L_t^s is determined by those same variables plus two other variables, one reflecting the lenders' lending capacity l_{cap} and another is the size of non-performing loan NPL_{SME} . All variables are expressed in a natural logarithm.

To the extent the demand and supply of loan data are not distinguishable, only the amount of extended loan is observable. The main idea is to estimate both equations and compare the results, from which one can identify whether the estimated loan from the supply equation is greater or smaller than the estimated loan from the demand equation. It is supply-constrained if the latter is larger than the former, and vice versa. The concept of credit rationing discussed earlier is particularly relevant when it is supply-constrained. The regression results using quarterly data for the entire period and the period prior and during COVID are shown in Table 5.1.

While the lending rate for working capital significantly caused loan demand to fall prior to and during the pandemic, the effect of GDP on demand for credit was

Table 5.1 Estimated loan supply and demand to MSMEs

Variables	Total		Before COVID		During COVID	
	Credit demand	Credit supply	Credit demand	Credit supply	Credit demand	Credit supply
$\ln(r_{wc})$	-0.625*** (0.0964)	-0.400*** (0.0980)	-0.579*** (0.184)	-0.0708 (0.0981)	-2.131** (0.624)	-1.736 (1.095)
$\ln(y)$	1.184*** (0.126)	0.393* (0.212)	1.234*** (0.180)	0.152 (0.145)	-0.239 (0.650)	-0.278 (0.857)
$\ln(l_{cap})$		0.551*** (0.130)		0.885*** (0.0932)		0.531 (1.640)
$\ln(NPL_{SME})$		0.0119 (0.0472)		-0.0520* (0.0292)		0.0535 (0.245)
Constant	-2.273 (2.072)	0.343 (1.771)	-3.123 (3.070)	-1.315 (1.416)	22.13 (10.86)	13.11 (27.58)
Observations	32	32	25	25	7	7
R ²	0.980	0.988	0.975	0.996	0.914	0.926

Note Using quarterly macroeconomic data

* = significant at 0.05 level (there is only a 5% probability that the result was due to chance)

** = significant at 0.01 level

*** = significant at 0.001 level

significant and positive only before COVID. From the loan supply equation, the lending rate for working capital is not statistically significant, and so is the GDP growth. Banks' lending capacity and non-performing loans are significant only before the COVID period.

Looking at the gap between the estimated loan from the demand and supply equations, during the entire period such a gap fluctuated. Broken down the period into prior and during COVID, however, it is clear that the loan allocation for MSMEs during the normal or prior to the COVID period was more supply-constrained. This result was consistent with the credit rationing postulates. However, immediately after the onset of the pandemic (Q1 2020), the demand-supply gap widened sharply, mostly due to a steep fall in demand, before tapering off. As a result, the demand constraint became prevalent during the pandemic, reversing the condition beforehand. Hence, with the exception during COVID credit rationing has indeed contributed to the country's unduly low credit allocated to MSMEs, where both the interest rates and the banks' capacity to lend play a significant role.

Applying the same setting on micro data from SKLU Bank Indonesia with a new set of explanatory variables in both equations, the regression results based on the yearly data are shown in Table 5.2.⁴ The explanatory variables in the supply equation include: MSME annual omzet transformed into a categorical variable (*omzet*),

⁴ Note that the survey conducted by Bank Indonesia, from which the data were taken, began in a full scale only in 2018. Most data for 2017 were obtained from a pilot survey, hence incomplete; e.g., no data on credit need and lending rate. At first, we also tried to use the provincial data of rural bank, Bank Perkreditan Rakyat (BPR), as a proxy for access to finance. But we dropped it because of its insignificance.

Table 5.2 Estimated loan supply and demand to MSMEs

	2017		2018		2019		2020		2021	
	Credit demand	Credit supply	Credit demand	Credit supply	Credit demand	Credit supply	Credit demand	Credit supply	Credit demand	Credit supply
<i>omzet</i>	0.572** (0.281)		0.786*** (0.135)		0.412** (0.199)		0.622*** (0.205)		0.793*** (0.227)	
<i>dsratio</i>	0.320* (0.182)		1.770*** (0.322)		0.475*** (0.117)		1.082*** (0.369)		3.848*** (0.864)	
<i>liquidity</i>	3.88e-07 (9.97e-07)		-0.0184*** (0.00345)		-0.0104* (0.00525)		-0.0341*** (0.00919)		-0.0203*** (0.00745)	
$\ln(\text{assets}_{CUR})$	0.299*** (0.107)		0.342*** (0.0605)		0.384*** (0.0879)		0.284*** (0.103)		0.279** (0.112)	
<i>age</i> ₃	-0.332 (0.359)		0.0798 (0.186)		0.487 (0.361)		0.194 (0.325)		0.0404 (0.439)	
<i>export</i> _{1pct}		0.0225 (0.0888)		0.0292 (0.0237)		0.0546*** (0.0141)		-0.0922 (0.100)		
$\ln(\text{assets}_{FIX})$		0.507*** (0.0759)		0.200*** (0.0421)		0.218*** (0.0725)		0.293*** (0.0912)		0.266*** (0.0743)
$\ln(\text{creditneed})$				0.434*** (0.0464)		0.402*** (0.106)		0.286*** (0.0837)		0.328*** (0.0597)
<i>r_{wc}</i>				6.616 (24.54)		0.235 (2.972)		-0.0461 (3.005)		-4.392 (3.403)
Constant	6.767*** (1.069)	4.971*** (0.897)	5.668*** (0.546)	-65.67 (257.0)	5.999*** (0.898)	1.760 (30.50)	7.081*** (0.978)	4.933 (27.77)	6.519*** (1.014)	42.79 (29.89)
Observations	84	84	176	176	72	72	67	67	90	90
R ²	0.325	0.368	0.538	0.452	0.579	0.533	0.537	0.362	0.484	0.364

Note Using survey-based annual data

* = significant at 0.05 level (there is only a 5% probability that the result was due to chance)

** = significant at 0.01 level

*** = significant at 0.001 level

the debt-to-sales ratio (*dsratio*), the ratio of current asset to current debt (denoted by *liquidity*), the value of current assets (*assets_{CUR}*), and a dummy variable indicating the age of business by using 3 years as a benchmark (*age₃*). In the demand side, we included the share of product being exported (*export_{prt}*), the value of fixed assets (*assets_{FIX}*), the stated credit need (*creditneed*), and the lending rate for working capital (*r_{wc}*).

This time, the role of interest rate in the demand equation has diminished (insignificant and with alternating signs), replaced by the stated need for credit (*creditneed*) and the size of collateral (proxied by *assets_{CUR}*). It is on the supply equation that the presence of credit rationing appears prominently. The coefficients for the size of MSME, proxied by the annual omzet, the debt-to-sales ratio, and the value of current assets are all significant with the expected signs. The effect of MSMEs' liquidity is also significant, except in the pilot year 2017. The age of MSME, however, did not seem to matter much as its coefficient is insignificant.⁵

Similar to the national data case, prior to COVID the dominance of supply-driven constraints confirms the postulates of credit rationing hypothesis, where interest rates are not the only factor determining the amount of credit allocated to MSMEs. Lenders' structure of balance sheet and willingness to lend matter more than the interest rates. Only after the COVID strike both supply and demand fell but the demand for loan fell more dramatically, causing the loan supply higher than the demand. As before, the credit gap is derived from the difference between the estimated credit based on supply and demand equations, the results of which are shown in the negative slope line in Fig. 5.6, where the reversal from a supply-constrained to a demand-constrained condition due to COVID was more striking than in the national data case.

Having reviewed several cases during the survey and based on some interviews we conducted, however, we suspect that asymmetric information as a standard explanation of credit rationing is not the only factor hindering banks to allocate credit to MSMEs. Another important factor is the transaction cost. As the loan size increases, unit costs decrease because transaction costs are fixed, hence driving a wedge between banks' funding costs and the lending rate. These fixed transaction costs can take many forms and occur in different levels, from the financial system level such as regulatory costs and the costs of payment and settlement systems, to client level such as the costs of maintaining relationship over time and across different financial products, to transaction level such as the costs for assessing a loan request, all the way to financial institution level such as costs for legal services, and IT equipment.⁶ Data on these cost components, however, are not available, and hence they are not included in our disequilibrium model. All those costs are related to the smallness in transactions, banks, and market size, and they constitute an important limitation to outreach in

⁵ Since some of the significant coefficients of independent variables are not in natural log, cautions have to be made in interpreting those coefficients. To take as an example, in the 2019 supply equation a one-unit increase of omzet results in $(e^{0.786} - 1) * 100 = 119.5\%$ increase in loan. Similarly, for *dsratio*, a one unit increase in the ratio would raise 487.1% loan, and a one unit increase of liquidity would result in a loan decrease of 101.84%. In the 2019 demand equation, a one percentage increase in export would lead to a 5.61% increase in loan.

⁶ The role of each in affecting lenders' willingness to lend to smaller borrowers has been discussed in many literature and studies; see for example Beck and Torre (2007).

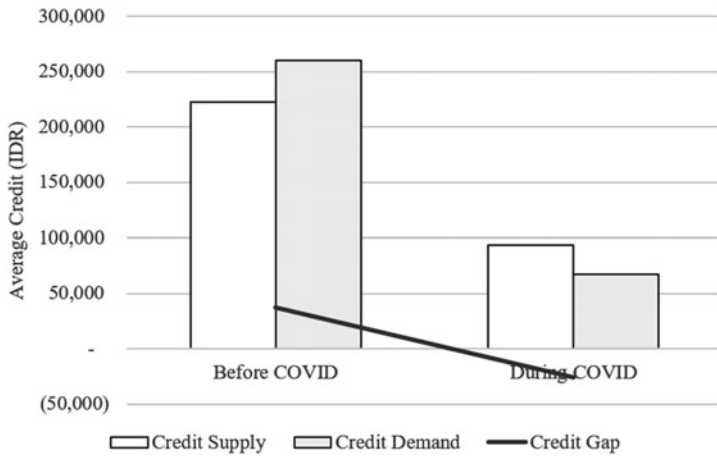


Fig. 5.6 Estimated credits to MSME before and during COVID, and estimated supply-demand gap. *Source* Own estimation

the provision of credit, payment and savings services for MSMEs as they do not constitute profitable clientele.

Under such circumstances, banks may ration at a lower-than-market equilibrium interest rate rather than raising the interest rates because the latter could lead to lower expected repayments (higher default risk). The interest rate for a popular loan for MSME in Indonesia, known as *Kredit Usaha Rakyat* (KUR), is also regulated and fixed by the government (set at 6%). The recorded size of KUR in 2022 was around Rp365.50 trillion, allocated to more than 7.6 million MSMEs throughout the country. The impossibility to use interest rates as screening technology entices banks to use noninterest screening devices such as collateral or other forms of assessment. Combined with the default risk, high transaction costs due to high assessment and monitoring costs not only increase the borrowing costs but also restrict MSMEs' access to external finance.

From the perspective of borrowers, many MSMEs particularly of the microtype also had to face high transaction costs when dealing with banks and other formal lending institutions. This explains why some of them prefer to have informal transactions or exchanges with “friends and family” that have the advantage of both parties knowing each other well including their reputation. Even in cases where no written contract on interest rate and payment schedule was made, such informal transactions could be useful for the lenders to monitor and exert “pressure” at virtually no costs (Cornelisse & Thorbecke, 2010).

5.3 Trade Finance

In our previous study, we argued that some of MSMEs exporting their products also faced a financing gap of different types. We wrote in Azis (2022, 28–29): “Some

MSMEs outside Jawa reported that after putting much effort and energy to penetrate the foreign market, they were finally able to find foreign buyers. But they complained that after delivering the products they could not get the full payment promptly despite the agreed transactions. Payments were made only after a long delay, putting pressure on the business cash flow. At the end, they had no choice but abandoning the contract all together, at the cost of no more exports and sales. Having limited network and connection, those exporting MSMEs need help from the government. Assisting them should be neither difficult nor costly, yet absolutely necessary given the weak domestic demand especially during the pandemic, and the governments' repeated assertion to encourage MSMEs to reach beyond the domestic market." In the current survey, we also found a number of cases showing similar problems raised by the exporting MSMEs.

Trade finance is the financing of goods or services in a trade transaction; the finance is provided directly by banks that issue letters of credit. Payment problems as part of the list of issues dealt within trade finance have been among the major challenges faced by those involved in international transactions. The main problem is a lack of access. From the perspective of improving efficiency and productivity, this problem is a serious matter. It is no secret that exporting is a way to inflict efficiency and productivity to MSMEs.

Defined as the difference between the number of applications to finance companies' participation in international operations and the number of approvals, trade finance gap is large and growing in size. Globally, it reached almost USD2 trillion, representing 10% of global trade. Almost half of the rejected cases were MSME-related applications (compared to only 7% from multinational companies). Clearly, MSMEs are disproportionately affected by it.



Survey story: Fishermen boats in Manado, North Sulawesi. It is one of so many coastal villages throughout Indonesia where many pockets of poverty are found (the number of poor living in coastal area reached almost 18 million in 2022). While the country is ranked by the FAO as the sixth biggest fish producing nation, the living conditions of most fishermen have hardly improved.

Their challenges include illegal fishing by domestic and foreign ships (and the related smuggling), rising fuel prices, poor equipment, small market scale, and the impact of climate change. In some communities, they formed a cooperative to strengthen the bargaining position. However, in some coastal areas that we visited, few big firms took advantage of government regulations by requiring the fishermen to sell their products to the firms at a lower-than market price. Many of the above problems cannot be solved by simply providing access to finance. A better network with stakeholders would have been more effective

Yet, the importance of trade finance for small business cannot be overemphasized. It is distinctive from other financing in that it is normally a high-volume and low-cost source of finance with a small risk of default. More importantly for exporting MSMEs is the lower risk of convertibility and transfer risk, for which insurance can be written to cover the risk that a buyer may make a deposit of local currency to pay for an international transaction (many MSMEs find themselves unable to convert the local currency into foreign exchange for transfer to the exporter). Bank-financed trade credits are also backed by receivables and self-liquidating, albeit short term. From this perspective, trade finance can protect small importers and exporters from counterparty risks.⁷

A standard practice in domestic and international trade is to sell or have transactions on payment terms. In international transactions, usually importers (buyers) pay the suppliers (MSMEs) cash advance for goods to be shipped, allowing them to delay the payment of the invoice. Since the shipping takes time, delayed payment is justified. On the other hand, MSMEs as exporters need this advanced payment as a security to avoid the risk of non-payment and, more importantly, to support their cash flow. But for various reasons, there are cases where MSMEs with limited knowledge and network do not receive even the cash advance. At any rate, this payment gap causes imbalances in MSMEs' cash flow. This is where trade finance can help. Among companies of all sizes that rely on trade finance, the number of MSMEs is the largest.

A lack of local access to trade finance is also seen as a new form of financial exclusion. It was cited by the World Trade Organization (WTO) as a significant non-tariff barrier to trade, and an obstacle to economic diversification. There is a strong linkage between the availability of trade finance and trade flows. The 2008 GFC provided an important lesson on how international trade was highly sensitive to the working of trade finance. A decline in the number of correspondent banking relationships during the crisis significantly affected the ability to send and receive international payments. Those MSMEs involved in the global supply chain were among the most affected customers. Although the conditions in trade finance markets improved after the GFC, the structural difficulties in accessing trade finance of many developing and poor countries remained in place. The COVID pandemic and the repercussions of the new geopolitical configuration, especially after the war in Ukraine, worsened the situation. On top of that, the predicament of developing countries and MSMEs is also worsened by the disinclination of global financial sector to invest in developing

⁷ Of course the risk of having insufficient working capital often faced my MSMEs remains, because export credit agencies are not directly involved in providing working capital. In such circumstances, exporting MSMEs can offer export credit agency cover to their banks as security for working capital financing (insurance policy to the bank).

countries where banks as trade finance suppliers tend to refocus toward their largest customers in developed countries.

In short, while exporting can impose forces for efficiency and higher productivity, MSMEs that are potentially able to penetrate foreign markets will continue to suffer from the trade finance gap. Hence, one important source of MSME productivity is wasted. Piecemeal intervention maybe helpful but not sustainable. Efforts have to be intensified to make structural changes by involving not only the government but also the private sector, multilateral financial institutions, rating agencies, and official bilateral credit agencies. Expanding the use of asset-backed securitization funding, including counter-cyclical payment structure, and a clearer risk differentiation by rating agencies and bank regulators, are examples of important structural changes that need to be considered.

5.4 Digitalization: Reducing Financing Gap and Other Advantages

The term “digitalization” is not seldom consorted with “digitization,” and is often implied in the term “digital transformation.” Digitization can be simply defined as a process to convert analog data into digital format, by which some tasks can be improved (e.g., managing MSMEs finance and cash flow) and others can be made faster and easier (e.g., payment system). Digitalization refers to the act of improving the process of digitization. More generally, it refers to firm’s operation using digital technologies to alter the business model or create new opportunities, all of which are expected to improve firm’s efficiency and productivity. Digital transformation, on the other hand, goes beyond digitizing processes. Unlike digitalization, it is a paradigm shift to restructure—in a fundamental way—how firms are organized, and to reshape the entire organizations by leveraging digital technology. The transformation may involve integration of data analytics, digital tools, automation, and cloud computing to stay competitive in the digital age. In what follows, we highlight the potential merits of using digital technology for MSMEs in general and for reducing the financing gap in particular.

Using digitalization, banks and other financial institutions could access more and better information about their existing and potential clients, including MSMEs. This prospect is conceivable if MSMEs also improve their digital footprint. They could become more noticeable to banks and other potential lenders, and their record keeping also likely improve by using the digital technology. Consequently, their credit risks can be better analyzed, allowing them to access the existing credit facilities such as KUR and other sources more easily. Given the high likelihood of credit rationing due to asymmetric information and high transaction costs discussed earlier, only MSMEs with good prospect lenders are willing to allocate credit to. More efficient MSMEs and those able to adjust to the changing market demand and consumers’ tastes have a greater chance to receive credit. In this context, digital technology can be applied to daily tasks to improve efficiency and productivity. It could also help

provide new opportunities, be it new product or new process of production. When digitalization results in some automation, it can be combined with several operations to do menial and repetitive tasks that would save time and costs for the business, e.g., purchase orders for procurement, shipment tracking, invoicing, and other B2B-related activities that are critical parts of supply chain.

Digital technology could also help MSMEs to expand market potentials. By utilizing social media and other internet platforms, MSMEs can resist the limitations of their physical location, allowing them to serve far-distant markets and remote customers to enlarge the customer base. It could also help MSMEs to enter competitive export markets, for example through on-line advertisement to showcase their unique products or other features (e.g., women-run, organic, health-conscious, safeguarding environment, and sociopreneurship where the business also helps solve some social concerns). All these things are difficult to conduct if done manually. The use of digital technology can also help to diminish the risks within supply chains. Branding is also an area where digital technology can be useful for. To the extent operating in competitive markets requires good branding, digitalization can help MSMEs to create company's name and logo, make visual identity design, and write the company's mission and values.

Another important benefit of using digital technology is having a greater opportunity for connectivity. As discovered from the survey discussed in Chaps. 2, 3, and 4, having a good network is extremely important to enable MSMEs to improve their productivity. A process by which various forms and members of network connect is what connectivity is all about. With the ever-changing conditions and environment, connectivity with customers, employees, and other stakeholders could have a profound impact on business profitability and productivity. Using digital technology could make it easier for MSMEs owners/operators to engage more directly, frequently, and instantly, with suppliers, customers, and regulators. They can trace and evaluate customer credit, use it as a risk mitigation device (e.g., set credit limit or other conditions), and as cash flow management tool. According to a recent survey, more than 70% of MSMEs using social media in Indonesia used it as a medium for consumer interaction DSInnovate (2023). Engaging with their own employees is another important task that would improve business performance, especially for MSMEs with a relatively large number of workers. The use of digital technology can also make training for employees more seamless and effective.

In the mid of higher competition and lower purchasing power at the time our survey was conducted, we found several cases where MSME owners/operators are actively trying to develop innovations and customizations in their products to meet clients' requests. Many of them confirmed that such efforts would have been difficult and more time-consuming had they not used digital technology or internet-based communication. Digitalization also enables MSMEs to diversify and advance their business model to navigate around direct-to-consumer (D2C), consumer-to-consumer (C2C), and business-to-business (B2B) models. New participants could also gain from acquiring better information about the challenges and opportunities experienced by incumbent MSMEs.

All the above virtues from using digital technology can essentially help improve the MSMEs' performance, on which banks and other lenders can consider in making the decisions on credit, such that they would limit the credit rationing and extend more loans to MSMEs. This would help mitigate the problems of financing gap.

To make the potential virtues reality, however, some collaborative efforts are needed. The importance to create an enabling ecosystem is second to none. At the outset, raising the awareness about the benefits of using digital technology is a necessary step. The government is expected to collaborate with the relevant parties, e.g., phone carriers, internet providers, e-commerce companies, regulators, banks, and other potential lenders. Encouraging new innovators and startups to develop a variety of products and services that could help support MSME operations is another important part of the ecosystem. But beyond collaboration, there is also a need for coordination (often weak in most developing countries). More data on MSMEs are also needed to measure and track their progress and problems.

On the hardware side, the availability of reliable electricity and internet connectivity are necessary, yet is often lacking, especially in remote and rural areas. MSMEs also need to have sufficient tools including computer and peripheral devices. On the software side, improving the MSMEs' digital skills and knowledge is of utmost important. Raising the digital literacy and making the users feel comfortable using it is not easy, especially among the elderly and less educated members of the community. It takes time, not an instant process. Equally important is to remove the digital barriers on the part of suppliers and customers, including MSMEs' employees. MSMEs will not find it necessary to go online if individuals and potential customers are not online. Another important effort that needs to be made is to ensure that the fees on connectivity and the prices on hardware and devices are affordable. This could be supported by loans earmarked for purchasing devices and paying the internet fees. While digitalization makes technical things easier, the bureaucracy and procedures to obtain required documents ought to be streamlined. The government's initiated One-Stop Service (OSS) program, intended to simplify the process of obtaining licenses and other necessary documents, is an example in the right direction. Last but certainly not least is the need to provide a protection from cyber attacks. Any operations involving digital technology always pose some security risks. To raise users' confidence, such risks need to be mitigated.

If all the above efforts result in a wider spectrum of community able to use digital technology, not only it would help mitigate the problems of financing gap and low productivity of MSMEs but also would minimize the risk of digital divide and promote inclusion, where majority of individuals (irrespective of their gender), households, businesses and geographic areas could have similar opportunities to access information and communication technologies for a wide variety of activities. With some additional efforts, such opportunities can also be made available to informal MSMEs.

To sum up, digitalization is more than a buzzword for MSMEs. It could literally narrow the financing gap, directly through better and more instant information, and indirectly through various efficiency-enhancing channels. Since such positive virtues are not preordained, however, collaborative efforts and supporting policies are required.

5.5 Fintech and Digital Payment

Related to financing gap, digitalization or a process of moving into digital technologies is often promoted as one of the solutions to narrow the gap. Despite all the efforts, however, the adoption of digitization (making analog information digital) remains relatively low albeit growing among banks in Indonesia. The main objective of implementing digitization is cost reduction. Non-bank lending firms using digitization have been also growing but remain small. They too have a role in reducing the financing gap for MSMEs.

A combination of financial services and technology, commonly known as “fintech,” is aimed at making it easier for borrowers including MSMEs to get loan, save, or invest online. The main factor behind the potential role of fintech to narrow the financing gap is the ease of getting the funding when bank lending is difficult to access. Some arguments have been made that a greater use of fintech can help narrowing the class divide (between micro, small, and medium enterprises), the urban-rural divide, and even the gender divide. But whether that is the case, it remains to be seen. The effect of using a new approach or technology must be predicated not on an ideal case but on the real world as it is. Supporting policies and other initiatives are needed if narrowing the class divide is to be attained. Fintech alone will not do the job.

Similar to the trend of digitization use, only few banks and non-bank lending firms are familiar with—and actually use—fintech solutions. Some banks used it to reduce the cost of complying with regulatory requirements and due diligence, while others used it for credit assessment (transactions using fintech often fall under the category of peer-to-peer or P2P lending). Concrete data on the usage are still scarce, but our discussions with some bankers suggest that only few of them implemented fintech despite its potential to enable banks to “know customers” better and in a more reliable and efficient way, lower the costs, and, more importantly, reduce the incentives for credit rationing discussed earlier. From the demand side, there is an indication that only few MSMEs used fintech. They did so to diversify the source of external funding, not to substitute bank finance, as they also received loans from banks.

If fintech indeed could lower the costs, lending to MSMEs by banks using fintech should be high, mitigating the financing gap problem. Unfortunately, data and studies on the relation between the use of fintech and credit to MSMEs in Indonesia are scarce, let alone between fintech and trade credit. But studies in other countries tend to show that there is no clear correlation between the two. When asked through surveys, most lending institutions, especially smaller banks tend to report that digitalization is expected to enhance their ability to assess MSME risk, primarily through cost reduction. Yet, lending to MSMEs continues to be lower than desired, and the rejection rates for trade finance application by MSMEs remain elevated. This suggests that cost alone is not the primary reason for the small size of credits to MSME, which once again supports the postulates of credit rationing.

MSMEs’ use of digital payments follows a similar trend. Although increasing, it remains low. Unlike big companies that have established new digital networks to facilitate trade and finance by leveraging digital technologies for improved supply-chain efficiency and transparency, many MSMEs in Indonesia find it difficult to cap-

italize on such opportunities. During the COVID pandemic, people worried about its transmission through exchange of physical items including currency notes, thereby resorting to the use of contactless payment transactions. This provided an opportunity toward using digital modes of transactions. The transition was also pushed by the government and the monetary authority for quite some time. Indeed, initial media reports about the increased usage of digital payment modes seem to confirm this expectation.

In Asia ex-China, the growth of digital payment usage was double-digit: almost 60% of adults now have an account, and 23% of adults made digital merchant payments. The figures for China was even higher, 89% and 82%, respectively. More than half of them used digital payments after the beginning of COVID. While the gender gap involved in the transition was relatively low, however, the gap between rich and poor adults remains high, around 10 percentage points (World Bank, 2022). This raises the question over the effectiveness of the current structure of digital payment in helping to strengthen financial inclusion.

To understand better and make a more realistic conjecture about the sustainability of the transition to digital modes, one needs to look at the evidence, especially after COVID. Consider the case of digital payment made online using a smartphone camera to read a barcode with a special algorithm through Quick Response (QR) Code. In Indonesia, it is called the “Quick Response Code Indonesian Standard” (QRIS), which unifies different types of QR from various Payment System Service Providers (PJSP) using QR codes. Every QR code-based PJSP provider must use QRIS that works across various e-wallets and banking apps (unlike QRIS, however, e-wallets are deeply embedded in digital services such as GoPay for Gojek and Tokopedia). After the customers select the products and services, they then use the smartphone to scan using the QR code provided by the service providers and the switching institutions that are approved by Bank Indonesia to process QRIS transactions. The users are then asked to verify the account by entering a password. If successful, the transaction is transferred from the users to the merchant account. This is where security can be a significant factor. No matter what means of payment we are making, transactions can be carried out by scanning on QRIS (hence the motto “one QRIS for all payments”). In addition to QRIS, another digital payment transfer in Indonesia is known as the “BI Fast” which allows fund transfers from one bank to another using the recipients’ account details, mobile number, or email address.

Although QRIS offers contactless advantage, convenience of transactions, and faster payment speed, there is a potential level of risk inherent in it such as privacy issue, data theft, hackers, and others.⁸ During the COVID pandemic, QRIS became a favorable alternative since users did not need to make exchange of physical items. Other transactions based on digital payments such as mobile banking and cloud-based electronic money applications also increased in usage during that period. Is the trend structural or cyclical? Was the surge during COVID due to a desperate

⁸ For the MSMEs and merchants in general, QRIS can increase sales, reduce cash management costs (transactions are recorded automatically and can be viewed at any time), no need to bother providing change and avoid counterfeit money, can separate money for business and personal uses, can increase credit profile information for credit application, and prevent fraudulent bookkeeping of cash transactions.

attempt as no alternative options for MSMEs to continue their business without it, or did it reflect a change in the mindset about moving toward digital modes? If the former applies, the trend is likely cyclical. If the latter holds, it may reflect a structural trend. Given the fact that the increase in the number of digital payment users was higher than bank accounts before COVID, however, the potential for usage growth in Indonesia is quite high.

The question of acceptance or rejection toward the use of QRIS is determined by a number of factors, including users' performance expectations and trust. Because there is an intrinsic factor inherent in technology, namely security, trust is crucial in ensuring that the security in QRIS can be controlled and accounted for by the provider. Looking at China experience (the world's fastest growth in mobile payment), users' concerns could only be mitigated by clear and strong regulations on digital payments. Although holding financial institutions accountable for harmful practices is a standard practice, prevention should also include informing consumers about the risks of predatory financial practices, especially to less educated adults and other vulnerable groups who often have limited prior financial experience. These groups, including MSMEs, are often more exposed to financial abuse. After all, for any financial products, services, and the regulatory environment in which they operate, the goal should be to help people achieve financial well-being. And this can be realized not only by creating incentives for service providers to design and deliver products and services that would benefit consumers, but also by preventing and mitigating consumer risk and harm by weeding out bad practices.

Another deciding factor is cost. The usage of QRIS by customers tends to be higher when some forms of discounts are offered by merchants, and no fee is charged to either the customers or the merchants. The difficulty in assessing the actual usage of QRIS is due to among others the fact that merchants and consumers may symbolically accept it but in practice not really use it, either because of their outright opposition, rejection, or postponement. Although no concrete and reliable data for Indonesia are available, the experience of other countries going through a similar transition to mobile banking or digital payment is worth to note. In India, more than half of individuals reported that they did not make any change in their use of digital payment methods during the post-pandemic lockdown. This trend highlights the possibility that the use of digital payment methods may not have increased as much as anticipated during and after the pandemic.

It is too early to make a conjecture about whether the increase in the usage during COVID is only temporary or more likely permanent. It remains to be seen whether after COVID people will return to their pre-pandemic transaction behavior by reverting to using currency notes for transactions, or the increased adoption will continue and become more permanent. The pandemic had clearly catalyzed digital payment, but there are limits in leveraging digital payments for certain segments of the society and for certain types of businesses including MSMEs that rely on suppliers who are willing to receive only cash payments. Even at the beginning of COVID, it was not easy for elderly residents, MSMEs, and less educated groups in many countries, developed and developing alike, to make a switch from using cash to digital channels for various reasons. Some pointed to their lack of digital skills and a lifetime of

reliance on cash, others highlighted the low digital access especially for those living in remote areas.

It is therefore safe to argue that until a longer series of data of post-COVID are available, it is difficult to conclude whether the increased use of digital payment during COVID was cyclical or structural. In the meantime, some theoretical concepts on why a certain group of people are accepting while others are rejecting the use of a new technology is useful to explore. It helps us understand better about the circumstances behind the limitation of usage of the digital technology or any new change for that matter.

5.6 Rejection and Acceptance

Two types of people are identified: those who prefer order and precision and to work within established patterns of rules, hence likely resisting a change, and those who tend to explore new things and even challenge the existing rules and break away from established procedures. While most of the concepts on resistance toward using new technology point to a range of factors, from market-related, psychological, product features, and cultural (individual characteristics), we need to understand them better from the point of view of these two types of people. Among several concepts, the one based on the theory of “adaptive-innovative cognitive style” introduced by Kirton (1976, 1994) has been used extensively in the analysis of consumer innovativeness. Rather than people’s cognitive level, ability, or complexity, the concept describes how people’s mode of intellectual activity in processing information, making decisions and problem-solving determines their reaction and approach to a new alternative technology.

Psychological barrier, such as communicability barrier, is one of the cited reasons for resistance. One needs to be aware, however, that such a barrier can also reflect a perceived—not real—ineffectiveness when used to describe the benefits or shortcomings of using digitalization or any innovation (Talke & Heidenreich, 2013, 6). Product feature is another commonly cited reason, referring to the perceived difficulties of trying to use or introduce the digital technology to other merchants. It partly reflects the shortcomings of both the hardware and software aspects of digitalization. On the hardware, the non-existence or unreliable internet connection is a factor. On the software, a lack of internet or digital information literacy especially among the older adults is the significant impediment. For some MSMEs residing in rural areas, going digital is not a matter of choice but of availability and affordability. Resistance is also attributed in no small part to the cultural factors. Some perceive that the new technology conflicted with their values and traditions and the benefit of learning and using it is no longer worth the time and money spent given so many hurdles they have to go through.

There are several types of dismissal: opposition, rejection, and postponement. The most extreme form is objection, and this could lead to rejection. Take the case of digital payment or online marketing designed to help MSMEs. Even when there are

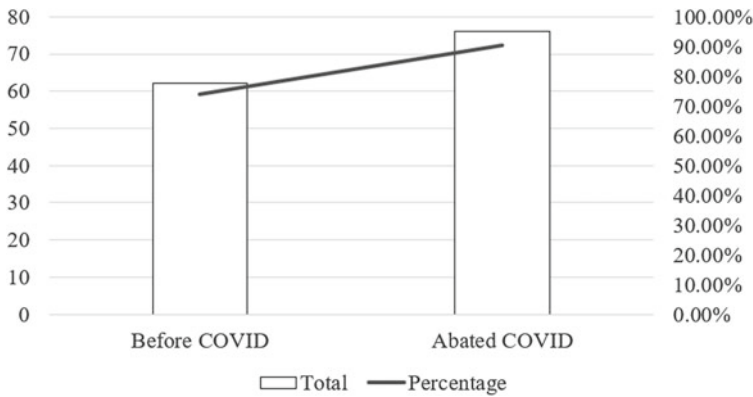


Fig. 5.7 Increased use of digital technology by MSMEs. *Source* Survey data

no obstacles related to the internet access, some MSMEs may object to the use of the digital-based modes. The reasons for opposing it can be related to cognitive style, situational factors, or simply because it is perceived as not offering them a differential advantage or even giving them a relative disadvantage.⁹ Such an objection may come early before trying. When there is a mass rejection of this type, social planners should think of an alternative strategy and approach. Once such a strategy is implemented, the digital payments or online marketing may be accepted, may still be rejected, or it may be postponed. With or without social planners’ efforts to persuade MSMEs, there is also a possibility that MSMEs may proactively search themselves for further information, which in turn may lead to either final acceptance or persistent rejection.

During our survey, we also made an effort to find out if the increased use of digitalization during COVID, particularly the digital payments, the e-commerce such as Tokopedia, the messaging platforms such as WhatsApp, and the social network platform such as Instagram and Meta (formerly Facebook) is expected to continue, tapering off, or will decline once COVID ends.¹⁰ What we have learned from our interviews on the subject is that, during COVID they shifted to digital or online technology out of necessity in order to stabilize their sales. As shown in Fig. 5.7, the increase was not too dramatic, lower than in other countries during the pandemic.

⁹ We conducted a small experiment with two MSMEs operating in North Sulawesi on this to test whether cost is an impending factor. We provided some funds to be used for online marketing, but found that the enthusiasm quickly diminished after they used up those funds. On digital payment (QRIS), we also found some MSMEs refused to accept anything but cash. Some traders argued that the reason for it was because they needed to purchase goods and materials whose sellers would accept only cash. Others simply showed their outright rejection of any forms of payment except cash without giving specific reasons. Most of these MSMEs had actually received guidance and information from BI about the benefits of using QRIS and had put the QRIS label in their store.

¹⁰ Another online platform that some MSMEs have been actively using during COVID was the GoPay digital payment platform, which is a form of e-wallets that are embedded in digital services such as the Gojek super app and GoFood. Through GoPay customers can conduct transactions directly from their mobile devices and is accepted by a large number of merchants across Indonesia. However, not all regions where our respondents reside have the Gojek services, and for various reasons (cost is one of them) most did not use the services.

The reported impact in terms of sales volume was also not too significant. By the time our interviews were conducted (end of 2022), some of them had ceased using the digital technology

But another benefit from using the digital technology emerged. Most of our respondents cited an increase in their network, albeit mainly with their customers (existing and new ones). A recent study by Estiko (2023) looked at a particular case of how halal label could increase visibility to customers. Having such a label makes MSME products permissible or acceptable in accordance with Islamic law (in the case of food products, for example, they are guaranteed to use acceptable sources such as a cow or chicken that are slaughtered according to the law). It is argued that its effectiveness to help increase the sales could be enhanced by using e-commerce platforms. In the current format, however, the study found that there is no significant impact of halal labels on sales. This could be due to a number of factors, such as label's subtle visibility on the platform being overshadowed by other product details and seller's rating, and consumer purchasing behaviors that might not prioritize the halal certification. To make the efforts more effective, it is suggested that the government should encourage the e-commerce platforms to promote and enhance the visibility of such labels to ensure that they are not overshadowed by other product details.

While overall the digital usage by MSMEs during COVID was on the rise, it tapered off afterward. It was unclear why this occurred. Some reported because they fell ill and unable to continue the networking, others said that some of the counter-parties were no longer contactable. Interestingly, only those MSMEs receiving support and guidance from BI managed to maintain and even expand the number of network. To the extent other MSMEs also utilized the digital technology during COVID, many also reported that they were facing more competition as other MSMEs had become their business rivals.

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Chapter 6

Network and Size



Revealed in Chaps. 2–4 is the prominent role of social capital, particularly networking, for MSMEs to improve productivity. In Chap. 5, we explored the role of, and the issues surrounding, the financing gap and digitalization, in which it was shown that overall Indonesia’s MSMEs continue to face financing gap problems, and their adoption of digital technology is still limited. This is despite the fact that access to finance and digitalization could significantly affect MSME productivity. What remains to be investigated is the relative contribution or strength of financing and digitalization in the dynamics of MSMEs’ productivity.

It is commonly argued that size matters. That is, compared to smaller firms, bigger firms have all the advantages they can enjoy to make improvements in productivity. Does this mean size is the deciding factor for productivity? Or, are there other factors more important than size? In the context of our survey finding, what about the role of network? How big is its relative contribution to productivity?

Cultural factor could affect the way inputs influence outputs. In our case, it is the role of culture that jointly shape the relations between size, network, and other factors with productivity. To investigate quantitatively the relative contribution of the above factors, local environment and culture needs to be accounted for as they could play some role in influencing the way those factors determine productivity. Given the fact that Indonesia is a multicultural nation with significant ethnic, religious and linguistic diversity that could influence her development process and how millions of MSMEs throughout the country operate and perform, it is even more important to include these culture-related elements in the analysis (Azis, 2019, 2020).

Since the majority of MSMEs consider network to be the most important component of social capital, our next task is to test the primacy of network along with other relevant variables including firm size and cultural factor in influencing the MSME productivity. For this purpose, we used hybrid (secondary and primary) data. Our particular interest is to compare quantitatively the extent of the contribution of network and that of firm size in affecting MSME productivity by including a cultural variable in the equation.

The bulk of this Chapter is devoted to the above task, the organization of which is depicted in Fig. 6.1. We begin in the next Section with a simple association test,

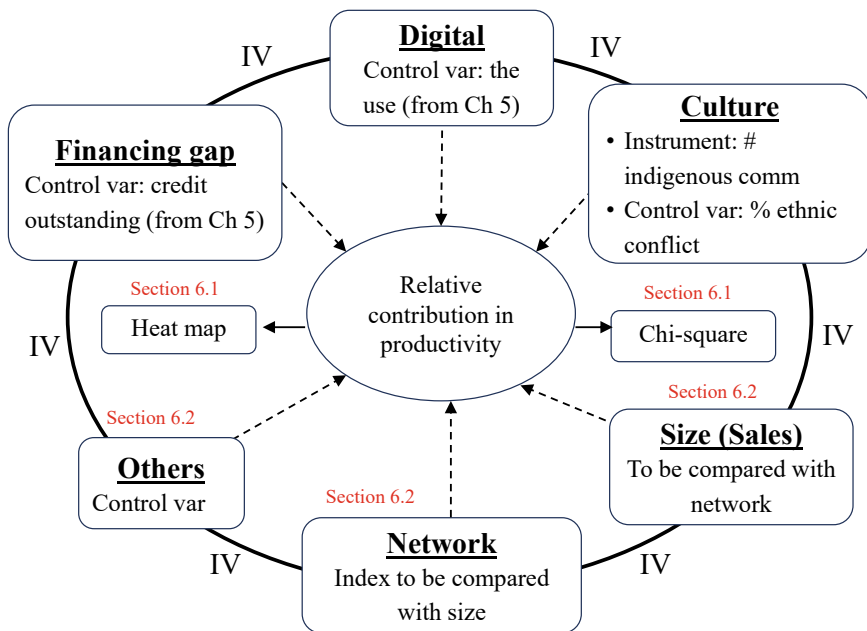


Fig. 6.1 Organization of this chapter

using simple heat maps before applying Chi-square tests. In Sect. 6.2, we focus on comparing the role and contribution of firm size and network in affecting productivity by running the instrumental variable (IV) regression. In the model, we included culture-related variables, one as the instrument and the other as a control variable. In the set of control variables, we also included the two factors discussed in Chap. 5, finance and digitalization.

6.1 Simple Association

To the extent the results from the survey and the use of alternative approaches point consistently to the importance of network to establish linkages and interactions among MSMEs as well as between MSMEs and other stakeholders, leveraging network appears to be the most important measure that would have a profound effect on MSME productivity. Through a series of interviews conducted outside the formal survey, we heard repeated complains about a lack of access and the desire to have better interactions with other MSMEs, government apparatus, suppliers, and customers including bigger firms and potential lenders. Some were so confident that it would not take too long to make productivity improvements once a network is established. On the other hand, a number of studies have revealed that the size of business matters the most in determining productivity. Compared to what small firms can do, bigger

firms with all their advantages are generally more able to conduct activities that can boost productivity, i.e., raising output and/or economizing inputs.

Analytically, we could simply test between size and network and determine which one has a bigger influence on productivity. The effect of size is probably easier to detect, but from the perspective of policy intervention it makes more sense to think of finding a possible intervention that could affect network rather than the size. The owners of the firms themselves can determine what size they can afford or prefer to have and operate. To delve into this matter, we first compare the association between size and productivity and between network and productivity by plotting data in heat maps. We subsequently run a simple association test using the Chi-square to compare the observed and expected results. The test is intended to determine if differences between observed and expected data are due to the relation between variables or just a chance.

To get the information on productivity, we gathered inputs from MSMEs' regarding the change in their business' productivity during the period of pre-COVID and late (or abated) COVID. After explaining the definition of productivity, i.e., value of output compared to value of inputs, two sets of questions were used: first, whether their productivity decreasing, unchanged, or increasing; second, approximate the quantity of change by using a particular range of percentage change, (0%), \pm (>0–50%), and \pm (51–100%). Hence, there are five alternative answers to this question.

Those who suffered from a decline in productivity during the abated-COVID period often had some excess inventories. They were more inclined not to increase production unless new orders arrived. But they still had to pay wages and rents, and also made payments to the suppliers. Most of these MSMEs operated in the non-farm sector. On the other hand, MSMEs in the farm sector felt that the COVID pandemic did not affect their productivity too much. Weather conditions and other climate change related factors produced a lot more effects on their activities. It appears that MSMEs who were able to either maintain or raise their productivity include those that used digital technology (e.g., e-commerce and social media platform), and those that diversified their products (e.g., garments industries producing masks).

For the size, we used the average annual sales as a proxy. We followed the classification based on Law No 20/2008, i.e., when the annual sales are less than IDR 300,000,000 the respondents are categorized as micro; when the sales are IDR 300,000,000–IDR 2,500,000,000 they are small; and when it is IDR 2,500,000,000–IDR 50,000,000 they are classified as medium.¹ Since our respondents were located in different regions, we deflated the sales value by the per-capita wages in each region to reflect variations in regional economic conditions.

¹ We did not use the new classification of MSMEs based on PP No.7/2021 because BI's classification upon which our survey was based, still followed the UU No. 20/2008.



Survey story: Traditional weavers in Boti village, Kie District, East Nusa Tenggara. They are part of the indigenous tribe that has lived for generations and is among the last Kingdom on the island of Timor (there are more than 300 Inner Boti people and around 2,500 Outer Boti). The tribe maintains their cultural values, keeps certain rituals to strengthen the human relations and social bonds and to connect humans with the sacred. Having limited contacts and network with outside parties, and with no external funding, the women weavers produce woven materials for their own clothing and few are for sales to some visitors (shown in the above picture). All the raw materials they use are natural, and they also preserve the spinning and weaving methods that are sustainable and environmentally friendly. By standard measures, they may have a relatively low productivity. But the cultural importance and the beauty of their products, along with the historical and philosophical values embedded in the motive they use, which they inherited from their ancestors, give a distinct value to the products and become the source of their comparative advantage

To get the information on network, we distinguished the quantity (number of network) from the quality part (effectiveness of network) for an obvious reason: having more networks does not guarantee gaining greatest benefits if the effectiveness (quality) of those networks is questionable. The idea is similar to the concept of “centrality” where it is not only the prominence (out-degree centrality) or influence (in-degree centrality) of connected links that matters, but also the “neighbors” connection. Thus, a network system depends not only on how many connections it has but also on how many connections its “neighbors” have, and on how many connections its “neighbors” neighbors” have, and so on. The degree of influence of members in a network also matters, and so do the strategic position and the reputation of members.

Consider the case of an MSME network in a cluster. If one MSME is well connected to another MSME who is not well connected themselves, the first MSME is “influential” (because others may depend on it) but may not gain benefits from the network. On the other hand, if the other MSME is also well connected, the first MSME can reap benefits from the network. Thus, the quality of networks matters.

We therefore constructed a “network index” by multiplying the quantity part with the quality part, leaving us with three measures of network: network quantity, network quality, and network index. Since this is neither a binary nor an easy to quantify

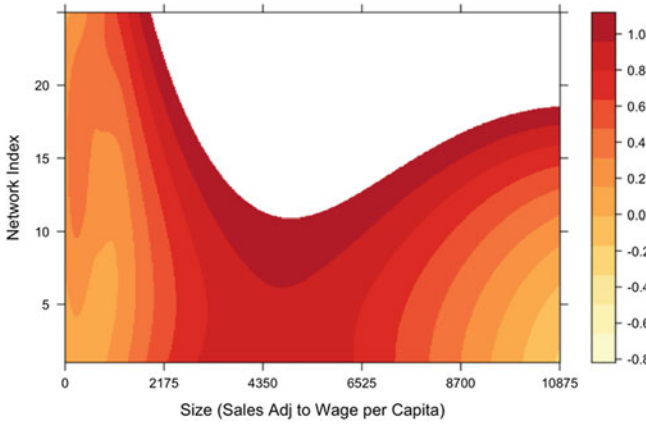


Fig. 6.2 Heatmaps of network index and sales, pre-COVID. *Source* Own estimation

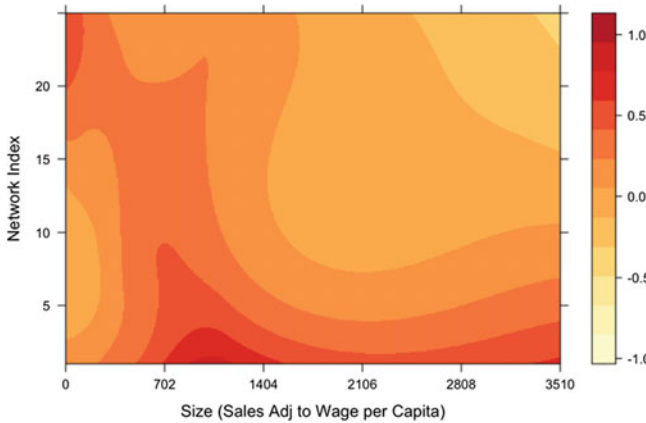


Fig. 6.3 Heatmaps of network index and sales, COVID. *Source* Own estimation

measure, we used the following grouping to capture variations in the intensity of network: very few, few, medium, many, and a lot. We attached the following range for both the network quality and the network index: 0–20%, 21–40%, 41–60%, 61–80%, and 81–100%, respectively.²

From the heatmaps shown in Figs. 6.2 and 6.3 it can be seen that high productivity MSMEs (darkest red color) are associated with high network index but not with the size. On the other hand, low productivity MSMEs (light yellow) tend to be associated with lower network. No consistent association is detected between size and produc-

² In acquiring the above information, we specifically asked the MSMEs to respond to each question by comparing the case prior to and during the late COVID period (the latter can be interpreted as COVID abated period).

Table 6.1 Results of the chi-square test

	Productivity versus network index	MSME size versus network index	MSME size versus productivity	Productivity versus digital use
Pre-COVID	Significant	Significant	Not significant	Significant
COVID	Not significant	Not significant	Not significant	Not significant

tivity: both the highest and lowest productivity cases are associated with stronger sales (size). Hence, while there is some degree of association between network and productivity, the association is relatively weak. In the meantime, no association can be detected between size and productivity. There is also no association between all the three variables during the COVID period (Fig. 6.3).

To have a more concrete picture, we conducted the following Chi-square analysis. We categorized the size according to Law No. 20/2008 for micro, small, and medium enterprises, adjusted by the per-capita wages, and for the productivity we used the following classification: lowest, second lowest, third lowest, fourth lowest, and highest, based upon which we fixed the percentage value as the threshold on each group, e.g., the lowest refers to those whose productivity change reached up to 20th percentile. We classified the network into low, medium, and large, and used the corresponding percentage value as the threshold, e.g., low refers to those who had a network index up to 33rd percentile. The results of the chi-square test for the two periods are displayed in Table 6.1.

It appears the only non-significant association is between productivity and size. This seems to defy the common view about the role of firm size. Although a network has a significant association with firm size, and it has also a significant association with productivity, by itself size does not seem to be associated with productivity. In the mean time, consistent with the arguments made in Chap. 5, the use of digital technology has a significant association with productivity. Compared to the heatmap presented earlier, the Chi-square test is more robust with respect to the distribution of the data. Although the sample size requirement is restrictive, the test does not require homoscedasticity in the data. Also, the variances among groups do not need to be equal. While instructive, however, caution needs to be exercised when interpreting the above results. In addition to a lack of causality evidence, the practical relevance and the policy implications of the results are very limited, if not none whatsoever. A more rigorous analysis is therefore needed.

6.2 Instrumental Variable (IV) Approach

As is well-known in any impact study, it is perilous to isolate a single factor as the determinant of an outcome. While having a network is critical for most MSMEs to improve productivity, other factors may also have some contributions to the improvement. In our survey discussed in Chaps. 2, 3 and 4, we had included some of those factors. They were embedded in the goals, challenges, and specific problems within

the hierarchy or network. Here we conducted the test using a different approach by utilizing secondary data that include non-economic factors and the results of interviews.

It would have been desirable to apply a randomized experiment (RE) to test the role of network as part of social capital on productivity. However, given some constraints, and the limitations of RE, we instead conducted the test using the Instrumental Variables (IV) technique on the mixed secondary and survey data where problems of confounding or mixed effects are minimized.³ Considering the importance of social capital that consists of three components, norms, trust, and network, we focused on the network variable and included on the list of explanatory variables the frequency of ethnic conflict as a proxy of a lack of trust, and the presence of indigenous communities (*masyarakat adat*) as a proxy for norms.

The starting point for the model framework is a proposition that size and network jointly determine the MSME productivity. However, since both are not completely exogenous as they can be influenced by other factors, we cannot run a direct regression using either of those two variables. We need to find the purely exogenous and time-invariant variables that influence the non-exogenous part but also have an effect on the relation between MSME productivity and the aforementioned two variables (size and network). This variable is to be used as the instrument in the model. The multicultural nature of Indonesia with the significant ethnic, religious, and linguistic diversity throughout many islands prompted us to use the presence of indigenous ethnic community as a candidate for the instrumental variable. This frequently overlooked factor is embedded in the way-of-life of the ethnic communities in different parts of the country whose activities include exchanges such as producing and selling products and buying goods for daily needs.

We also included a set of control variables, the effect of which may work only indirectly through the instrumental variable. As discussed in Chap. 5, the use of digital technology actively promoted by the government especially during the COVID pandemic must have had some effects on both the network and the size of MSMEs, hence it is included in the set of control variables. Another control is the size of credit outstanding that reflects a condition associated with the financing gap (also discussed in Chap. 5). MSMEs with higher credit outstanding—or facing less problems of financing gap—are likely to be those of the bigger size or having a good network.

The remaining control variables depict the socioeconomic conditions, including education level, health conditions, and ethnic conflicts in the localities/districts where the MSMEs operate. From the MSMEs' perspective, these variables may not be seen as to have effects on their activities. Even if they are aware about the effects, it is not easy for them to comprehend the intricate link and interactions between those variables and productivity performance, let alone the mechanism behind it. It is unclear, for example, how hospital density or school density in the locality where

³ Despite the strength and popularity of RE for impact study, the approach has been known to have some limitations, among others: it fails to analyze why the outcome when using other methods, viz., applying the exact replication of RE are either different or similar. Furthermore, RE cannot be used to design policies that require an analysis beyond program evaluation. Others also pointed to RE limitation in its inability to capture the general equilibrium impact of a policy measure.

they operate has any bearing on their business operations. Equally less obvious is the mechanism of how ethnic conflict would affect productivity (see Azis & Pratama, 2020). The complete list of variables used in the model is displayed in Table 6.2.

Two alternative measures of network are used: Network 1 is the network index capturing both the quantity and quality of network as described earlier, and Network 2 is the index that captures only the number of network (quantity). In the first stage of the 2SLS method in the IV model, we evaluate the effects of the IV and control variables on those two measures of network, and the size of MSME (listed at the top of the columns in Table 6.3). We also evaluate the regression results in which the endogenous variables are the interactions between network and size. The two types of interaction are in the last two columns of the Table. The instrumental variable (“Dummy ethnic”) is listed in the first row.

The results show that Network 1 gives better statistical results than Network 2, in which all control variables are significant with the expected signs. More importantly, the role of “Dummy Ethnic” is highly significant (at 5%) in explaining the variation of network index. In reality, MSMEs’ capacity to get involved in a network is highly influenced by local conditions where they operate. Though some of the conditions may not be purely exogenous—vary according to changes in other exogenous variables—the presence of ethnic group is strictly exogenous and non-time varying. This variable turns out significant and it restricts the number and the effectiveness of network (the coefficient is negative and significant).



Survey story: Interviewing a micro business owner producing a healthy drink using local ingredients in East Kalimantan. This micro business had difficulties to access affordable loans and to adopt digital technology. However, based on the owner’s explanations and clarifications, its capacity to grow depends on factors beyond financing and technology. More specifically, it is influenced by its ability to acquire reliable inputs, to meet local regulations, and to reach greater market access. Networking with suppliers, regulators, traders, buyers and other relevant stakeholders would have helped them in those areas, and could be more effective than helping them with financing

Table 6.2 List of variables in the model

Variables	Definition	Unit	Sources
Productivity 1	Perception of average change of output value divided by the cost of all inputs	Percentage point	Interview
Productivity 2 (Categorical)	Perception of average change of output value divided by the cost of all inputs	Unit	Interview
Network 1 (Network index)	Index of perception regarding the beneficial network that MSMEs have given the overall quantity of network they have	Unit	Interview
Network 2 (Quantitative network)	Perception of how many of network do each respondent has	Unit	Interview
Size (Sales adj to wage per capita)	Adjusted value of MSMEs average sales to wage per capita in each region	Percentage point	Interview
Interaction 1 (Network Index \times Size)	Interaction variable of network 1 and size	Unit	Own calculation
Interaction 2 (Quantitative Network \times Size)	Interaction variable of network 2 and size	Unit	Own calculation
Dummy ethnic	Dummy of whether the district has formal/informal ethnic community	Available = 1; unavailable = 0	CBS
Formal ethnic	Number of formal ethnic community in a region	Unit	CBS
Credit outstanding	Value of each MSMEs' credit outstanding	Rupiah	Bank Indonesia
Digital	Dummy of the digital use	Using = 1, not using = 0	Interview
Hospital	Number of hospitals per 100,000 people (in natural log)	Percentage	CBS
Primary	Number of primary school per 100,000 people (in natural log)	Percentage	CBS
Poverty gap	The ratio by which the mean income of the poor falls below the poverty line	Percentage	World Bank
Share conflict ethnic	Share of conflict with other ethnics to total conflict in a region	Percentage point	Own calculation based on CBS

As commonly argued, ethnicity can affect interactions both within and outside the community. The rigidity of the boundaries may vary, but it nonetheless allows little or restricted interaction with the outsiders as part of their adherence to traditional values and culture. Under such circumstances, having a network with outside communities

Table 6.3 Results of the first stage of the IV regression

Variables	Network 1 (1)	Network 2 (2)	Size (3)	Interaction 1 (4)	Interaction 2 (5)
<i>Instrument variables</i>					
Dummy ethnic	-3.050** (0.031)	-0.427* (0.053)	-732.995** (0.037)	-9,805.774** (0.005)	-2,236.831** (0.008)
<i>Control variables</i>					
Credit outstanding	0.000** (0.011)	0.000 (0.265)	0.000 (0.912)	0.000 (0.393)	0.000 (0.763)
Digital	3.887** (0.004)	0.305 (0.102)	565.477 (0.111)	8,800.165** (0.013)	1,676.736* (0.072)
Hospital	2.434** (0.005)	0.222 (0.156)	21.635 (0.888)	1,873.790 (0.250)	182.783 (0.655)
Primary school	3.804* (0.051)	0.305 (0.339)	590.366 (0.165)	10,099.467** (0.015)	1,964.186* (0.052)
Poverty gap	-1.138** (0.000001)	-0.163** (0.016)	71.800 (0.485)	193.492 (0.857)	121.543 (0.661)
Share conflict ethnic	-24.209** (0.00001)	-4.880** (0.005)	-3,506.785** (0.027)	-41,076.401** (0.014)	-10,471.370** (0.015)
Constant	-4.923 (0.523)	2.166* (0.084)	-1,860.215 (0.256)	-35,455.959** (0.028)	-6,225.955 (0.122)
Observations	84	84	84	84	84
R ²	0.253	0.168	0.099	0.172	0.142

is difficult. Any intervention and influence from outside must first bridge the gap between the perspectives of the community in terms of their needs and problems and those of the outside communities. That may not be easy, as our research team have experienced during the visits to the indigenous communities of Boti in East Nusa Tenggara province and *Baduy dalam* (inner Baduy) in West Jawa. Extra efforts are needed to introduce new things and ideas, and it requires knowing the lens through which people in such communities perceive the world.

On the other hand, many traditions and aspects of human welfare in such communities are often more favorable than those found outside the communities, on which the latter could learn.⁴ Although the small business operations inside the communities may not have an ideal level of productivity due to the absence of networking, given the numerous positive traditions and norms they have kept since their ancestors time, having a lower productivity based on a standard measure may entail only small costs

⁴ Note also that different ethnic and indigenous communities, even among the tribe that has the same history and background, may have a different degree of rigidity. The case of *suku Baduy* is a notable example. While the outer *Baduy* (or *Baduy Luar*) still follows some rigid taboo system like in the inner *Baduy* (*Baduy Dalam*) they do so but not as strictly as the latter do. They are more willing to accept modern influences into their daily lives such as wearing colorful sarongs and shirts and working outside the community.

to the communities and society at large. Such traditions could range from the ancient belief to preserve natural resources and environment, and to live harmoniously with others. Combined with the embedded historical merits of those traditions and norms in what they produce, the real value of the products could be much higher. The conversion of a standard indicator into a broader measure of productivity (“cultural productivity”) could bring economic benefits beyond the commercial value of the products themselves. It could bring more resources useful for the protection and applications of the indigenous peoples’ cultural value, and, if the products under consideration are protected by intellectual property laws, it could also bring more benefits that could elevate the real value of (cultural) productivity. That is, the intangible asset holdings per person (similar to the value of a product brand) are higher than the case if the intangible components are ignored.

Although the coefficient for the “Dummy Ethnic” is significant, the effect of the same set of variables on the size is generally not better than the effect on the network (Table 6.4). The only other significant variable is the number of conflict with other ethnic groups as a share of total conflicts (“Share Conflict Ethnic”). The regression using Interaction 1 and Interaction 2 shows better results, in which two additional variables that have significant coefficients are the digital use (“Digital”) and the density of primary school measured in natural logarithm (“Primary school”).

The superiority of network over size is also evidenced by the results of the second stage regression, albeit milder than those in the first stage (Table 6.4). Although both network and size have a significant positive effect on productivity, the degree of significance is slightly higher for the former. To the extent the selected instruments are subjected to an exclusion test (Greene, 1997), the results of the Wald test shown at the bottom of the Table indicate that Model 1a passes the test at 10%; this is the model that we eventually use. The results of the Hausman test also show that the exogeneity cannot be rejected, albeit with a relatively low power (due partly to the low R^2 in the instrumenting regressions). Note that all results of the Hausman using dummy ethnic in Table 6.4 are significant at a five percent level, suggesting that Network 1, Network 2, Size, and Interaction 1 and Interaction 2 can be treated as endogenous variables and dummy ethnic as the instrumental variable. Table 6.5 shows the results of the robustness tests using the predicted values of Network 1, Network 2, Size, Interaction 1, and Interaction 2, obtained from the first stage model, where dummy ethnic was used as the instrumental variable. Note that the coefficient for Network 1 is also positive and significant, and that of other variables have the same sign, albeit with different degrees of significance.

It is therefore clear that having a network is critical for productivity improvements. What is opined by MSMEs, as revealed by the results of our survey, is validated by the finding of the IV model based on data from the relevant variables. The many observations and anecdotal evidence about a close association between large MSMEs and their productivity appear to miss the more important channel of influence. Specifically, it overlooks the role of network. Had smaller MSMEs been able to get the same number and quality of network as the large ones, the productivity improvement of both could have been comparable. MSMEs with a more extensive network, irrespective of the size, can achieve higher productivity than those of a large size

Table 6.4 Results of the second stage IV regression

Variables	Productivity				
	(1a)	(2a)	(3a)	(4a)	(5a)
<i>Instrumented variables</i>					
Network 1	0.054* (0.051)				
Network 2		0.384* (0.075)			
Size			0.000* (0.073)		
Interaction 1				0.000** (0.025)	
Interaction 2					0.000** (0.032)
<i>Control variables</i>					
Credit outstanding	0 (0.618)	0 (0.981)	0.000* (0.095)	0 (0.362)	0 (0.195)
Digital	-0.052 (0.675)	0.04 (0.669)	0.031 (0.672)	0.01 (0.889)	0.034 (0.628)
Hospital	-0.175** (0.025)	-0.129 (0.133)	-0.049 (0.35)	-0.075 (0.126)	-0.057 (0.246)
Primary school	-0.275* (0.07)	-0.188 (0.228)	-0.202* (0.063)	-0.239** (0.026)	-0.214** (0.044)
Poverty Gap	0.042 (0.236)	0.043 (0.318)	-0.035 (0.192)	-0.022 (0.278)	-0.028 (0.225)
Share conflict ethnic	1.792 (0.111)	2.366 (0.169)	1.277** (0.036)	1.179* (0.055)	1.260** (0.038)
Constant	0.772 (0.178)	-0.323 (0.719)	0.923** (0.034)	1.099** (0.01)	0.963** (0.022)
Observations	84	84	84	84	84
R ²	0.511	0.862	0.77	0.235	0.317
Hausman test	0.016	0.012	0.022	0.041	0.037
Wald test	13.38	8.86	9.98	11.63	11.20

Notes Network 1 denotes network index; Network 2 denotes quantitative network; Interaction 1 denotes the interaction of interaction variables between each of ethnic variables and network index; Interaction 2 denotes the interaction of interaction variables between each of ethnic variables and quantitative network. Sign ** Significance at 5%; * Significance at 10%; p-value in parentheses

with limited network connections or meager quality. It is the network, not the size, that matters more.

Before closing this Chapter, it is useful to illustrate some concrete examples or case-based evidence showing how having a good network can bring benefits to small businesses. These examples serve to complement the key findings throughout the book. Metaphorically, if the analysis based on models and data from Chap. 2 to the current one is like a life in today's virtual world, the case-based evidence brings that life back to reality. Observing MSMEs throughout many regions, it was clearly noticeable that those having a good network with stakeholders and performing well

Table 6.5 Robustness test of second stage IV regression

Variables	Productivity				
	(1b)	(2b)	(3b)	(4b)	(5b)
<i>Instrumented variables</i>					
Network 1	0.054* (0.001)				
Network 2		0.384* (0.01)			
Size			0.000* (0.01)		
Interaction 1				0.000** (0.01)	
Interaction 2					0.000** (0.01)
<i>Control variables</i>					
Credit outstanding	0 (0.416)	0 (0.966)	0.000* (0.066)	0 (0.272)	0 (0.132)
Digital	-0.052 (0.539)	0.04 (0.549)	0.031 (0.649)	0.01 (0.888)	0.034 (0.609)
Hospital	-0.175** (0.013)	-0.129** (0.029)	-0.049 (0.332)	-0.075 (0.143)	-0.057 (0.255)
Primary school	-0.275** (0.022)	-0.188* (0.082)	-0.202* (0.064)	-0.239** (0.035)	-0.214* (0.052)
Poverty gap	0.042 (0.157)	0.043 (0.149)	-0.035** (0.045)	-0.022 (0.18)	-0.028* (0.097)
Share conflict ethnic	1.792** (0.049)	2.366** (0.026)	1.277 (0.114)	1.179 (0.136)	1.26 (0.117)
Constant	0.772* (0.071)	-0.323 (0.579)	0.923** (0.034)	1.099** (0.015)	0.963** (0.028)

Notes Model b denotes the robustness check model; both using dummy ethnic as the instrument variables. Sign ** significance at 5%; * significance at 10%; p-value in parentheses

had a similar experience and story. In what follows are typical examples of such a story.

First is the experience of a small firm “Manika” in East Kalimantan producing handicrafts made of beads as part of the Borneo bead heritage. The products are generally used as personal ornamentation and value objects. For a number of years, the firm had performed well in terms of sales and cost efficiency, even during a crisis. Employing some 20 artisans, the owner, who inherited the business from her parents, maintained a good network with the relevant stakeholders, i.e., local government, policy makers, regulators, and other institutions. In particular, the firm has a good relationship with local offices of the Ministry of Industry, Ministry of Trade, and Ministry of Cooperative. The owner specifically indicated the case where the firm often had useful discussions with officials at the local office of the Ministry of Industry about product development and design, and potential new products the

firm could develop. The local office of the Ministry assisted them not only by sharing the necessary information about inputs' sources and market conditions, but also by providing tools such as woodcutters, sewing machines, and input materials (the raw beads). Having such regular discussions helped to ensure that the tools they received met the required specifications for producing existing and new products. Even when the officers were replaced by new ones, the firm managed to continue a good relation because the networks they built were not with the individuals, but the institution. The firm's owners firmly believe that such networks are essential for the business to grow, to raise efficiency, and to enhance productivity. A good network was also maintained with officers in the local Ministry of Labor and Manpower and the Ministry of Tourism. This made the task of obtaining a permit and other necessary documents easier to do.

Aside from government offices, the owner also kept a good relationship with a charity agency involved in various social activities (e.g., in clean water and sanitation programs) that brought benefits to the local community. Together with BI, the agency helped to build a gallery for the firm's products. Since, expanding the network with customers and suppliers is important for the firm to grow, having a good relationship with other institutions that are also supportive to the idea of creating a network is imperative. This is where the local BI office has been very helpful. The office assisted the firm with the promotion and participation in exhibitions, as well as in connecting the firm with new customers. As far as the network with lenders is concerned, at the time of the interview, the firm did not use any outside funding because they did not really need it. All expenses were self-funded. However, since having a good network with stakeholders is a principle that the firm holds consistently, and given the good performance of the firm, it is unlikely that the firm will have any difficulty to secure some outside funding in the future when it needs one.

Another case-based evidence is from a small agribusiness firm "Aspakusa Makmur" in Boyolali, Central Java. The main activity of this MSME is to collect and sell horticulture products, mainly vegetables, produced by farmers in the area who have been under the guidance of the local BI office for some years. Those farmers sell their products to the firm. After being sorted, weighed, wrapped, and packaged, they are then sold to the market through various retail stores. At the time of writing, the firm has five farmers as members of the group, involving more than 200 small farmers. In the beginning, these farmers sold their products mainly to the traditional and local markets, receiving low prices and with limited market. As they began to sell their products to the firm, a network was established, through which they were incentivized to improve some aspects of their production to meet the criteria set by the firm. In return, they received agreed prices and guaranteed purchases.

The firm also expanded its network. As this MSME developed a closer relationship with the local office of the Ministry of Agriculture, things had gradually improved. At one point, with the help of that office, they were approached by a technical mission from Taiwan. After a series of exchanges, the firm started to establish a network with some local chain stores. Through that network, in 2008 it managed to sell fresh vegetables in bulk for the first time to several big chain stores outside the region (i.e., Surakarta, Semarang, Surabaya, and Yogyakarta). This forced the firm to make some

adjustments, for example in product quality and packaging to meet the standard set by the stores, and also in the firm's accounting and book-keeping. In the process, the firm added a new equipment for quality control, e.g., cold storage with particular capacity and specification, a special machine with plasma ozone technology to preserve the freshness of food products.

One thing led to another. Through a contact with the regional investment board office, together with the local BI office, the firm received some help in terms of expanding the market and getting new customers. By working together with these institutions, members of the group were able to participate in activities such as exhibitions, business matching forums, and management training programs, from which they gained benefits for improving their business performance. Not only the management of the firm improved, but their sales also increased significantly. As the production and sales expanded, including for the export market, problems such as quality control and food grading became more and more important to address. Here too, a close relationship with the local office of the Ministry helped the firm to overcome several issues surrounding those problems. Also, internally the firm began to realize that as they had to start dealing with a larger market, and the number of product varieties increased (currently they managed about 80 types of vegetables/fruits including some rarely available products such as red amaranth, okra, and certain types of asparagus), it was necessary to make improvements in product sorting and packaging. Through a network with the stakeholders, the group was able to acquire new information and materials needed to support such improvements. When the COVID pandemic and the lockdown requirement hit, one of the stakeholders donated a delivery vehicle as the firm had to start delivering the products directly to the customers.

Having experienced the network-driven progress, this firm have received several awards, e.g., "Adikarya Pangan tingkat Kabupaten Boyolali 2012," "Anugerah Produk Pertanian Berdaya Saing tingkat Nasional, kategori Produk segar berdaya saing 2014," "Adikarya Pangan Nasional tingkat Provinsi Jawa Tengah, kategori Pelopor Ketahanan Pangan Tahun 2015." This MSME also won a competition organized by Tim Pengendalian Inflasi Daerah, TPID (the regional inflation-control team) for its achievement in helping to reduce the regional inflation.

Other similar success stories from good-performing small businesses that had a good network with the stakeholders can be found among our respondents. Some experienced real improvements after they formed a cluster involving other MSMEs, others were able to enhance the productivity after the local bank, upon the persuasion of the local BI office, agreed to write off some of the past debt and to extend new loan. Clearly, the power of networking is conceptually proven and empirically supported by evidence.

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Chapter 7 Summary



We are now at the end of our journey.

From the outset, we took a deliberate approach of listening to hundreds of MSMEs throughout the country. That listening is more powerful than talking. Unlike hearing, listening requires us to give our undivided attention to whatever is commented on by our respondents.

But there is more. Not only that we ought to be fully present and engaged in a conversation without talking much—sometimes even not at all—but the issues we converse about, and the questions we ask, must reflect the real concerns according to MSMEs, not what they are according to us. This perspective suggests that the questionnaire, the hierarchies, and the networks we used in the survey must be based on a conversation and deep dialog with them. When about to frame the questionnaire, we were concerned whether we talked about the right issues and asked the right questions. Indeed, in many approaches to deal with development issues, including the one we are working on here, the limitations of implicit assumptions used by those approaches, reflecting in the questions being asked, are often ignored (Redman, 1980). Of those limitations, the difference in perspective and framework on time horizon, market structure, and aggregation over the issues in question is among the most common ones (Kanbur, 2001). For this very reason, we conducted the off-line and online pre-surveys to learn about the relevant issues and challenges that MSMEs had been dealing and struggling with, about their accomplishments, hopes, aspirations, and shattered dreams.

Every life, including that of millions of MSMEs, can be made better by improving our listening to them. And we can and should all do more of, if our genuine intention is to elevate their productivity and improve their welfare. The central premise of this study is that too many policy problems can be traced, in the ultimate analysis, to the gaps between intentions and actions. Listening and designing an appropriate policy application can help close the gap between what policy seeks to achieve and what it accomplishes, the gap between what MSMEs need and what the public policy offers. The ability to effectively listen and ask questions can reduce the differences in the mental bandwidth of those whom the policies are intended for and those who design the policies, so that they will understand better what causes the gaps.

Of many obstacles to listen and ask effectively, behavioral barriers are among the critical ones. Cognizant of the fact that human bias is an inevitable part of human behavior and conditions, in which respondents whom we asked and listened to may objectively perceive themselves and their environment (a type of cognitive bias), we adopted a particular approach to obtain and rank their perceptions in a way that we could capture the non-tangible parts of their feelings, the intensity of their choices, and the consistency of the rankings. It is not just about asking questions and listening to the answers. How we ask and synthesize the answers matters a lot.

For these reasons, after constructing the relevant hierarchies and networks, we specifically designed the questionnaire in a pairwise comparisons fashion. Following the *Analytic Hierarchy Process/Analytic Network Process* (AHP/ANP) approach, we systematized the results to generate the consistent ranking. For the AHP case, that consistent ranking was derived from the eigenvector (based on the maximum eigenvalue), and for the ANP the consistent ranking was obtained from the limit of supermatrix (based on the stochastic weighted supermatrix). The process to build, and the contents within, the hierarchies and the networks are explained in Chap. 2, and brief mathematical explanations are given in Appendices B and C.

We first adopted the above approach to generate MSMEs' preferred ranking of social capital compatible (SC-compatible) policies. To the extent one policy may either reinforce the effect of, or create a trade-off with, other policies, we then proceeded with attempts to find and rank the policy-mix. This strategy instilled the realm of policy-making as there was hardly a case where social planners took one single stand-alone policy. Yet, to construct the hierarchies for such a strategy also requires taking account the complexity and the dynamics of several SC-compatible policies when they are paired or combined.

Since different groups had not only different interests and ranking of preferences, but also different attitudes toward being truthful or not about their state/profile when expressing their perceptions, attempts were made to identify the preferred policies that could be aligned with the interests of the overall groups. Only policies that met such a condition would be considered "implementable SC-compatible." We adopted the *mechanism design theory* (MDT) approach to find which among the SC-compatible policies and policy-mix are implementable, and what mechanisms or rules could be used to implement them. For this purpose, in Chap. 3 we performed a series of monotonicity tests on the ranking results of AHP/ANP.

In many cases, the gap between what policies sought to achieve and what they accomplished was due to the institutional constraints. In such circumstances, it is more important to find the right institution or mechanism than to focus only on searching policies by making an assumption that the prevailing institutions can make those policies effective. In MDT, it is the mechanism, not the policies, that are endogenous.

Based on the results of the preference ranking using a network that includes feedback effects in Chap. 2, the one appeared consistently as most preferred SC-compatible policy was to have a network for interactions, using which MSMEs could form business linkages among themselves and with other stakeholders. Discussed in greater detail in that Chapter, such findings were derived from the responses to the carefully crafted questionnaires, the contents of which were based on direct inputs

from MSMEs. Hence, not only the responses to the questionnaires, but also the questionnaires themselves capture the perceptions of the respondents. They reflect the mental bandwidth of MSMEs.

The same conclusion was uncovered from the case of policy-mix, in which the highest ranked policy was always the one that includes network for interactions. Even when the preferred policy turned out different, i.e., to provide supporting infrastructure as revealed by MSEs (but not MEs), the other preferred policy in the mix was to establish linkages, which is analogous to having a network.



Survey story: A traditional shop in Wamena, Papua, selling various handicrafts produced by local tribe that belongs to a number of related ethnic groups, the most prominent of which are Dani (in the main valley), Lani (to the west) and Yali (in the South-East). Their businesses are self-funded, not relying on bank lending. Helping the tribe community by giving them loans or money is not effective, but helping them with networking with outside parties is

On the policies implementability, it was revealed in Chap. 3 that some of the preferred policies failed to make the preference of one group (MSE) aligned with that of another group (ME). Similarly, as discussed in Chap. 4, some SC-compatible policies and policy-mix preferred by ME and MSE could not be aligned with what the social planners believed to be the right policies for MSMEs. It is therefore important to find a mechanism by which we can identify policies that are alignable with the interest of the overall group (society) to qualify them as implementable.

It was evident from the monotonicity tests that a policy of creating a network for interactions could align the preferences of ME and MSE, hence implementable. It was also revealed that an indirect mechanism could be designed by social planners without knowing the MEs and MSEs state/profile. Did the COVID shock make their perceptions change? From the test results, having a network continued to receive the highest priority during the COVID pandemic. The shock did not seem to alter MSME perceptions about the importance of having a network. In the case of policy-mix, the

implementability of creating a network for interaction was even more ascertained, as it included promoting linkages among themselves and with other stakeholders in the policy pair. Such a mix can be potent as it is capable of harmonizing the network and the two related components (establishing interaction and linkages). In the language of MDT, the social choice rule (SCR) is a dominant strategy and incentive compatible.

Interestingly, the above finding about the implementability of creating a network for interactions was derived under the condition that the respondents took into account the complex interrelations among objectives, criteria, and alternatives (System 2). If they ignored such complexity (System 1), the implementable policy was to provide supporting infrastructure. That is, when approaching the problem in a simplistic way, it is easy to come up with building infrastructure as the solution. But in a more realistic situation where MSMEs must in fact deal with problems that are more complex than what they seem, infrastructure is not the answer as it does not meet the social choice rule (SCR). Creating a network is.

Comparing the preferences of social planners and those of MSMEs, the gap between the plan and the achievement became more evident. As elaborated in Chap. 4 based on the long list of policies that have been taken during the past several years, social planners seem to place the highest priority on financing. Network for interaction came only the second, followed by the provision of supporting infrastructure. Broken down the comparison into social planners versus ME's preferences and social planners versus MSE's, the same order of ranking applied to social planners and MSE but not social planners and ME. Indeed, looking at the array of government measures taken thus far, providing more financing tends to be the social planners' preferred choice in responding to MSMEs' multitude of problems. The ongoing push toward raising the share of subsidized credit known as *Kredit Usaha Rakyat* (KUR) from 20 to 30 percent by the banking sector is a notable example.

Although loan financing is important, many MSMEs did not see it as the main factor, certainly, it is less important than having a network for interaction. Given the same shock, if small firms could have a similar network of connections enjoyed by large firms, the productivity improvements of the two would have been comparable. Even for the second and third ranked priority, the MSMEs considered having the supporting infrastructure and the ability to resolve matters related to regulation and legal issues are more important than financing.

Since the primary sources of inputs for all the above findings were the perceptions and judgments of MSMEs, what constitute perceptions and judgments was discussed in the early Section of Chap. 4. It was also argued that the geometric mean is the most appropriate to use for averaging out group perceptions, and that adopting the dominance property in measuring the inconsistency of perceptions is preferable. The case where the results from using pairwise comparisons to generate ranking are different from those using a simple Borda count was also discussed in that chapter.

To check the implementability by contrasting the perceptions of ME and MSE on the one hand and those of the social planners on the other, the monotonicity test confirmed that creating a network for interaction is implementable. As discussed in Chap. 4, this policy will align the policy rankings of social planners and those of MSME regardless of the state/profile of MSME. Even when we broke down

into ME and MSE, where the results always put a network for interaction at the top, such a policy was found implementable. The only qualification is when we compare the social planners' ranking with that of MSE, in which the state/profile of MSE matters. In particular, if we assume that MSE responded to the questionnaire without considering the complex interrelation between the objectives, criteria, and alternatives (System 1), the SC-compatible policy that could align the preferences of MSE and social planners would be to provide more affordable financing. But when a more realistic case (System 2) holds, an indirect mechanism could be designed without knowing the MSEs and social planners' state/profile, i.e., create a network if System 2 and provide more affordable financing if System 1.

The primacy of network and linkages revealed from the survey is not too difficult to make sense of. However, its practical meaning for policy may remain fuzzy and imprecise because networking is one component (beside trust and norms) of social capital, a concept that has an imprecise meaning due to which economists are weary of using them. Based on the ranking results of the objectives, criteria, problems, and alternatives, and also confirmed by what we learned from our respondents about what they had gone through, an important channel connecting network-linkages and productivity likely works through transaction costs. These are costs that MSMEs must incur during the process of buying, producing, and selling, including expenses for getting permits, settling legal matters, selecting inputs, identifying potential markets, accessing affordable financing, choosing modes of production, or opting for payment system. Information pooling and sharing through a network would enable them not only to lower production and marketing costs, but also to reduce the search costs significantly. The latter makes all the above actions easier to conduct, allowing productivity to improve. Ignoring search costs is equivalent to assuming zero transaction costs, which makes it impossible to understand fully why most small businesses fail to achieve higher productivity.

The importance of transactions' costs in development performance has long been known. From Commons (1932), Coase (1937, 1960), Arrow (1969), North (1992), Williamson (2008) to Cornelisse and Thorbecke (2010), all recognized the critical role of transaction costs, the size of which could be determined by the prevailing institutions. Embedded in the institutions is social capital. As revealed from our previous study (Azis, 2022), participation and coordination in a cluster are critical for productivity improvements. They are particularly useful for information searching and sharing. But to have them and make them effective would require trust, which is another important element of social capital. With no trust, any participation and coordination would have limited effectiveness and likely failed to generate the intended benefits. Not only that trust is a necessary condition for participation and coordination, but it could also help provide the enabling environment for productivity improvements; e.g., ease to enforce contracts or to renegotiate them when problems arise.

Considering the whole eco-system in which MSMEs operate in Indonesia, the yearning for having a network could also be driven by a lack of reliable regulatory institutions. In such circumstances, the need for a network for interactions is even greater. To create a network beyond local communities where MSMEs operate requires specific investments for which a potential obstacle may arise, i.e., no

certainty whether interactions and relations built through the network will last sufficiently long to make the investment worthwhile. In the absence of reliable regulatory institutions and a basis for sustained interactions or relations, the pressure on MSMEs to survive by going alone “at all costs” could prolong—if not worsen—the problems that caused the productivity low to begin with.



Survey story: A sustainable farming in Garut, West Jawa. Led by a young farmer (second to left) who wanted to produce local food products and to raise the standard of living of farmers, the farm managed to grow well and to help educate the community about various aspects of farming that adhere to the environmentally sustainable standards. One of the reasons behind its success was a good network it built during the process

It is a common portrayal of MSMEs being run mostly by a traditional management system, informal, located in non-lucrative areas with poor network, and having limited funds and small assets. Access to affordable finance remains a constraint to most MSMEs in Indonesia as the country’s relative position in terms of MSME credit/GDP compared to other countries is not favorable. The gap in trade finance is even more severe, preventing some MSMEs from exporting, which is another important driver of productivity. Revealed from the results of the disequilibrium model presented in Chap. 5, during normal times credit allocation to MSMEs was constrained more by credit rationing imposed by lenders rather than limited demand for MSME loans. In this context, the focus of policy to mitigate the financing gap problem should be on reducing transaction costs, including assessment and monitoring costs, high default risk, and other factors associated with the asymmetric information faced by lenders.

Moving toward using digital technologies could potentially help narrow the financing gap, either through improvements in the “know your customer” process or through mitigating the forces that caused credit rationing (beyond the interest rates). Digitalization could also widen the product and input market, including market abroad, stimulate branding and information sharing, and showcase multiple products including the “stories” behind them. The convenience of transactions and speed of payment is another direct benefit that some MSMEs could reap. The increasing use of digital payment such as QRIS is a notable example, although its potential risks and privacy issues surround it remain a concern, and hence need to be addressed. It is also a fact that not all MSMEs are able or willing to use it.

Although growing in number, the usage of digitalization in Indonesia remains low. A combination of a lack of information and regulatory support, a relatively low digital literacy, difficulty to break the old habit (e.g., using cash), extra tasks that could be costly, and problems with hardware (e.g., electricity and Internet) had played a role in this area. The uptake of such technology during COVID could have been only out of necessity as they had no choice under the imposed restrictions, lockdown, and fear of infection. Until a longer series of data are available, it is too early to make a conjecture about the post-COVID trend, or whether the increase during COVID was cyclical or structural. Our observations in the field suggest that a distinction also needs to be made in targeting experienced and inexperienced users. Making the latter aware of how other MSMEs react to digitalization are important; e.g., advertising the experience and success stories of others. Beyond that, it is unwise to force the adoption of digitalization to some segments of MSMEs who find learning and using new technology unbearable or undesirable. A deeper study needs to be done to delve into the behavior of MSMEs over the dismissal (opposition, rejection, or postponement) of the usage of digital technology.

In Chap. 6 we re-tested the primacy of network (*viz.*, size) as being the most critical role in MSMEs' productivity improvement by using a model that considered two issues discussed in Chap. 5, i.e., the financing conditions and the use of digitalization. In addition to other socioeconomic factors such as education, health, and poverty, we also included in the model the presence of ethnic group as a strictly exogenous (instrumental) variable to reflect the cultural factor in localities where MSMEs operate, as well as other relevant control variables. This approach was done to avoid either under or over estimated role of network in affecting productivity. Incorporating cultural factor turned out to be necessary (statistically significant) to avoid the overestimated role of network and size. Even after taking into account the cultural factor, the primacy of network remained intact. Although both network and size have a significant positive effect on productivity, the degree of significance is higher for the former, and the results are statistically robust.

Having listened to MSME speaking about their hopes, aspirations, accomplishments, problems, challenges, and shattered dreams, including during the COVID pandemic, we may have sensed their visceral fear of sounding too demanding. The fact is, they are not. Instead, they are struggling but enthusiastic, put in a disadvantaged position but buoyant, and they are affected by crisis but hopeful. Providing them with better connection or network involving lenders, suppliers, customers, and those in charge of making policies and regulations is what they need the most. Drawing upon diverse methods of survey-based decision-making (AHP and ANP), a reverse game theory (MDT), and an econometric approach, the analysis throughout the book clearly shows that such findings are robust to a battery of tests. The monotonicity tests and the instrumental variable (IV) strategy using cultural factors as the instrument, and local conflicts and socioeconomic variables as the control variables, have all confirmed the primacy of network. For many MSMEs, networking is potent as it can help increase productivity and sales.

For mitigating and adapting to climate change and other environmental problems, networking could also be beneficial to MSMEs. While some whom we interviewed

were already aware of—and their activities had been affected by—climate change, many faced obstacles in accessing information about the changes to be made and the costs of engaging in sustainable practices. Most of these MSMEs were of the opinion that having a good network with the relevant parties including government and regulators, could be helpful for getting the necessary information and the tools to assess their climate impact, including access to green finance. Larger firms have such network, but micro and small businesses do not.

It has become more and more obvious that many problems MSMEs have to face can be rooted in the lack of networking. Measures to create a new network or expand/improve the existing one are greatly needed. Formulating policies along this line is not rocket science, albeit requiring a good understanding of the factual problems causing low productivity, and designing policies that are compatible with the prevailing social capital. For that purpose, one needs to listen directly to MSMEs first before selecting and designing policies.

We are now at the end of our journey. From the analysis throughout the book, the message is clear: the country's overall welfare will have much to gain from shifting the strategy for MSMEs toward delivering concrete support for networking, and a lot to lose from relying most of the time on offering financial assistance or adopting policies of the past. The stumbling blocks are often the inadequacies in our knowledge-base regarding the nature and sources of the prevailing social capital, and the institutional mechanisms for defusing tensions and diverse perceptions, and for reducing distrust among the stakeholders. Overcoming these difficulties simply requires us to “Listen and Design.”

Examples of Medium, Small, and Micro Enterprise



A medium enterprise producing leather-made bags and handicrafts in Jogjakarta, owned by a local entrepreneur (third from right). The enterprise has a good network with stakeholders including foreign buyers



A small enterprise, a coffee shop, in Kupang, East Nusa Tenggara. It is run by a group of female entrepreneurs, one of whom (in the above picture) was explaining about its history and the challenges they are facing. The shop tries to innovate by using a variety of local healthy ingredients, for which a network with other parties and local government helps to facilitate the process



A microenterprise selling various local produce in Alor, East Nusa Tenggara, run by indigenous *Kabola* tribe. Rather isolated in a mountain area, the most serious constraints for improving their business conditions are access to market

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Appendix A

Summary Statistics

See (Tables A.1, A.2, A.3 and A.4).

Table A.1 Summarized ranking of ANP policy preferences based on digital use

		Digital use: Yes	Digital use: No	MSMEs
Alternatives	Facilitate Information	0.142	0.154	0.144
	Facilitate Business	0.155	0.148	0.151
	Financing	0.108	0.099	0.106
	Interaction-Network	0.232	0.234	0.232
	Regulation & Legal Matters	0.174	0.161	0.171
	Supporting Infrastructure	0.190	0.205	0.195
Challenges	Operational Costs	0.287	0.277	0.285
	Competition & Imports	0.264	0.277	0.268
	Human Resource Constraints	0.052	0.064	0.055
	Institutional Constraint	0.237	0.225	0.233
	Infrastructure Constraint	0.159	0.156	0.160
Objectives	Meets End Needs & Market Share	0.000	0.000	0.000
	Improve Productivity	0.490	0.462	0.482
	Catalyze Community & Individual Potential	0.510	0.538	0.518
Observations		22	87	109

Table A.2 Summarized ranking of ANP policy preferences based on loan

		Loan: Above median	Loan: Below median	MSMEs
Alternatives	Facilitate Information	0.154	0.138	0.144
	Facilitate Business	0.165	0.146	0.151
	Financing	0.099	0.111	0.106
	Interaction-Network	0.229	0.234	0.232
	Regulation & Legal Matters	0.179	0.166	0.171
	Supporting Infrastructure	0.173	0.207	0.195
Challenges	Operational Costs	0.301	0.275	0.285
	Competition & Imports	0.252	0.276	0.268
	Human Resource Constraints	0.066	0.048	0.055
	Institutional Constraint	0.236	0.234	0.233
	Infrastructure Constraint	0.146	0.167	0.160
Objectives	Meets End Needs & Market Share	0.000	0.000	0.000
	Improve Productivity	0.500	0.474	0.482
	Catalyze Community & Individual Potential	0.500	0.526	0.518
Observations		75	34	109

Table A.3 Summarized ranking of AHP policy preferences based on digital use

Hierarchy component		Digital use: Yes	Digital use: No	MSMEs
SC-Compatible joint policies	<i>Interaction-Network</i>			
	Promotion	0.100	0.115	0.103
	Liquidity	0.094	0.061	0.087
	Environment	0.073	0.113	0.080
	Linkage requirement	0.126	0.129	0.127
	<i>Affordable Loan</i>			
	Promotion	0.026	0.027	0.026
	Liquidity	0.042	0.036	0.041
	Environment	0.041	0.057	0.044
	Linkage requirement	0.028	0.040	0.031
	<i>Regulation</i>			
	Promotion	0.035	0.031	0.035
	Liquidity	0.036	0.032	0.036
	Environment	0.015	0.024	0.017
	Linkage requirement	0.014	0.017	0.015
	<i>Infrastructure</i>			
	Promotion	0.086	0.068	0.083
	Liquidity	0.108	0.086	0.103
	Environment	0.054	0.056	0.054
	Linkage requirement	0.121	0.108	0.119

(continued)

Table A.3 (continued)

Hierarchy component		Digital use: Yes	Digital use: No	MSMEs
Institutional constraints	Lack of interaction	0.480	0.477	0.479
	Lack of government support	0.520	0.523	0.521
Financial constraints	Sales financing	0.360	0.397	0.367
	Access to financing	0.204	0.235	0.210
	Costs of financing	0.436	0.368	0.422
Challenges	Financial constraints	0.325	0.236	0.306
	Human resource constraints	0.245	0.342	0.263
	Institutional constraints	0.189	0.213	0.195
	Infrastructure constraints	0.241	0.208	0.235
Objectives	Meet end needs/market share	0.315	0.261	0.304
	Catalyze community and individual potentials	0.427	0.466	0.435
	Concerns over poor socioeconomic conditions	0.258	0.273	0.261
Observations		87	22	109

Table A.4 Summarized ranking of AHP policy preferences based on loan

Hierarchy component		Loan: Above median	Loan: Below median	MSMEs
SC-Compatible joint policies	<i>Interaction-Network</i>			
	Promotion	0.103	0.102	0.103
	Liquidity	0.087	0.086	0.087
	Environment	0.068	0.086	0.080
	Linkage requirement	0.114	0.133	0.127
	<i>Affordable Loan</i>			
	Promotion	0.031	0.024	0.026
	Liquidity	0.048	0.038	0.041
	Environment	0.049	0.042	0.044
	Linkage requirement	0.035	0.029	0.031
	<i>Regulation</i>			
	Promotion	0.047	0.030	0.035
	Liquidity	0.044	0.032	0.036
	Environment	0.025	0.014	0.017
	Linkage requirement	0.018	0.013	0.015
	<i>Infrastructure</i>			
Promotion	0.077	0.085	0.083	
Liquidity	0.102	0.104	0.103	
Environment	0.052	0.055	0.054	
Linkage requirement	0.101	0.127	0.119	
Institutional constraints	Lack of interaction	0.455	0.490	0.479
	Lack of government support	0.545	0.510	0.521

(continued)

Table A.4 (continued)

Hierarchy component		Loan: Above median	Loan: Below median	MSMEs
Financial constraints	Sales financing	0.377	0.363	0.367
	Access to financing	0.212	0.209	0.210
	Costs of financing	0.410	0.428	0.422
Challenges	Financial constraints	0.322	0.299	0.306
	Human resource constraints	0.242	0.273	0.263
	Institutional constraints	0.225	0.182	0.195
	Infrastructure constraints	0.211	0.246	0.235
Objectives	Meet end needs/market share	0.292	0.309	0.304
	Catalyze community and individual potentials	0.431	0.437	0.435
	Concerns over poor socioeconomic conditions	0.278	0.254	0.261
Observations		29	80	109

Appendix B

Analytic Hierarchy Process

As stated in the text, the first step in AHP is to decompose the problem into a dominance hierarchy. The top-most level of the hierarchy represents the goal or focus of the problem, the lower levels act as the criteria, and the lowest levels are the alternatives. The number of levels in the hierarchy has no limit, and the hierarchy itself does not need to be complete: an element in a given level does not have to function as an attribute (or criterion) for all the elements in the level below it. Once the hierarchy is built, we begin to compare all elements in all levels with respect to each element in each level. To generate ratio scales, however, the process of comparing ought to be done by way of pairwise comparisons with respect to certain higher criteria. The ultimate goal is to get the preference ranking of policies.

Two types of question are always raised: “Which of the two elements is preferred or ranked higher,” and “By how much.” On the second question, the AHP adopts 1-9 scale, where 1 denotes equal importance, 9 extreme importance, and the rest in-between degree of importance. For inverse comparisons we use the reciprocals, and for the problem of rank reversals we can address it by measuring the inconsistency index (discussed below). After all the rankings are derived, the last step is to synthesize the results. When needed, we can also conduct a sensitivity analysis.

Consider the case where $A_1, A_2, A_3, \dots, A_n$ are n elements in a matrix within a hierarchy, where in our case they are the policies to be ranked based on the perceptions of MSMEs. The pairwise comparisons on pairs of elements (A_i, A_j) are represented by an n -by- n matrix $A = a_{ij}$, where $i, j = 1, 2, 3, \dots, n$. Define a set of numerical weights $w_1, w_2, w_3, \dots, w_n$, and $A = w_i/w_j$, for $i, j = 1, \dots, n$. We can write W

$$\begin{array}{c}
 A_1 \\
 A_2 \\
 \vdots \\
 A_4
 \end{array}
 \begin{pmatrix}
 A_1 & A_2 & \cdots & A_4 \\
 w_1/w_1 & w_1/w_2 & \cdots & w_1/w_n \\
 w_2/w_1 & w_2/w_2 & \cdots & w_2/w_n \\
 \vdots & \vdots & \ddots & \vdots \\
 w_n/w_1 & w_n/w_2 & \cdots & w_4/w_4
 \end{pmatrix}$$

Since every row is a constant multiple of the first row, matrix A has a unit rank. By multiplying A with the vector of weights w ,

$$(A - nI)w = 0$$

where n is the eigenvalue and w is the eigenvector of A . The nontrivial solution is obtained if and only if $\det(A - nI)$ vanishes. Given A has a unit rank, all its eigenvalues except one are zero (the trace of matrix A is equal to n). It is the resulting eigenvectors that give the preference rankings of policies we are trying to find.

The question is: are these rankings consistent? If each entry in A is denoted by a_{ij} , then by the reciprocal property $a_{ij} = 1/a_{ji}$, and the consistency property requires that $a_{jk} = a_{ik}/a_{ij}$ holds. In the case of comparing two same elements, we have $a_{ii} = a_{jj} = 1$ which goes into the diagonal elements of A . Hence, if A is n -by- n the required number of inputs from the paired comparisons is less than n^2 because we only need to fill in entries of the sub-diagonal part of A . To establish the sufficient condition for consistency, the principal eigenvalue of A must equal n , which is the order of A .

Applying this in our survey, the precise value of w_i/w_j is not known because the entries going to matrix A are only estimates based on MSME perceptions in which many human biases and other perturbations can produce inconsistencies. While the reciprocal property still holds, the consistency property does not. By taking the largest eigenvalue denoted by λ_{max} , we have

$$A^p w^p = \lambda_{max} w^p$$

where A^p is the given matrix (perturbed from matrix A), and w^p is obtained from solving that equation. The matrix whose entries are w_i/w_j is a consistent estimate of A , although A^p itself does not need to be consistent. A^p is consistent if and only if $\lambda_{max} = n$. As long as the precise value of w_j/w_i is unknown, λ_{max} is always greater than or equal to n ; hence, a measure of inconsistency can be derived based on the deviation of λ_{max} from n , i.e., $(\lambda_{max} - n)$.

The proof that $\lambda_{max} \geq n$ and that A is consistent if and only if $\lambda_{max} = n$ is as follows. Let $a_{ij} = (1 + \delta_{ij})w_i/w_j$ and $\delta_{ij} > -1$ be a perturbation of w_i/w_j , where w is the principal eigenvector of A . Using $a_{ij} = 1/a_{ji}$ and $Aw = \lambda_{max}w$, we have

$$\lambda_{max} - n = \frac{1}{n} \sum_{1 \leq i < j \leq n} \frac{\delta_{ij}^2}{1 + \delta_{ij}} \geq 0$$

A is consistent if and only if $\lambda_{max} = n$. Proof: If A is consistent, then because of $a_{jk} = a_{ik}/a_{ij}$ each row of A is a constant multiple of a given row. This implies that the rank of A is one, and all but one of its eigenvalues λ_i is zero ($i = 1, 2, \dots, n$). It follows that $\sum_{i=1}^n \lambda_i = \text{Trace}(A) = n$. Therefore, $\lambda_{max} = n$. Conversely, if $\lambda_{max} = n$; $\delta_{ij} = 0$, and $a_{ij} = w_i/w_j$.

To get a certain level of matrix consistency where the elements are linearly independent, we can employ a consistency index:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

where n is the number of independent rows of the matrix. Obviously, if $CI = 0$ the matrix is perfectly consistent. As we deal with plenty of pairwise comparisons, the possibility of having consistency error also gets higher. Hence, a particular measure known as the consistency ratio (CR) is used (Saaty, 1997):

$$CR = \frac{CI}{RI}$$

where RI is a random index gathered from a random simulation of the pairwise comparison matrices CI s.

In AHP, it is recognized that human judgment is of necessity inconsistent especially when dealing with intangibles. What is important, however, is the concept of "near consistency." Considering the fact that human judgment is usually more sensitive and responsive to large rather than small perturbations, as long as the inconsistency index is less than 0.1 the results or the policy ranking are accepted, and it can be used because the resulting matrix and the corresponding vector remain consistent; see Saaty (1994).

When more than two elements are compared, the notion of consistency can be associated with the transitivity condition: if $A_1 > A_2$ and $A_2 > A_3$, then $A_1 > A_3$. In solving for w , this transitivity assumption is not strictly required; the inputted comparisons do not have to reflect a full consistency. Yet, as indicated earlier, the resulting matrix and the corresponding vector remain consistent. It is this consistent vector w that reflects the ranking of policies we are looking for.

Appendix C

Analytic Network Process

While both AHP and ANP use ratio scales, the presence of feedback influences in ANP requires a large matrix known as a supermatrix containing a set of sub-matrices. This supermatrix captures the influence of elements on other elements in a network. Denoting a cluster by C_h , for $h = 1, \dots, N$, and assuming that it has n_h elements $e_{h_1}, e_{h_2}, e_{h_3}, \dots, e_{h_m}$, the supermatrix can be written:

$$W = \begin{matrix} & c_1 & c_2 & \cdots & c_{N-2} & c_{N-1} & c_N \\ \begin{matrix} c_1 \\ c_2 \\ \vdots \\ c_{N-2} \\ c_{N-1} \\ c_N \end{matrix} & \begin{pmatrix} 0 & 0 & \cdots & 0 & 0 & 0 \\ W_{21} & 0 & \cdots & 0 & 0 & 0 \\ 0 & W_{32} & \cdots & 0 & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots & \vdots \\ 0 & 0 & \cdots & W_{n-1,n-2} & 0 & 0 \\ 0 & 0 & \cdots & 0 & W_{n,n-1} & I \end{pmatrix} \end{matrix}$$

To see the connection between a hierarchy (in AHP) and a network (in ANP) with its supermatrix, consider the following. When the bottom level affects the top level of a hierarchy, a network known as holarchy is formed, the supermatrix of which is

$$W = \begin{matrix} & c_1 & c_2 & \cdots & c_{N-2} & c_{N-1} & c_N \\ \begin{matrix} c_1 \\ c_2 \\ \vdots \\ c_{N-2} \\ c_{N-1} \\ c_N \end{matrix} & \begin{pmatrix} 0 & 0 & \cdots & 0 & 0 & W_{1,n} \\ W_{21} & 0 & \cdots & 0 & 0 & 0 \\ 0 & W_{32} & \cdots & 0 & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots & \vdots \\ 0 & 0 & \cdots & W_{n-1,n-2} & 0 & 0 \\ 0 & 0 & \cdots & 0 & W_{n,n-1} & 0 \end{pmatrix} \end{matrix}$$

Notice that the entry in the last row and column is the identity matrix (I) corresponding to a loop at the bottom level of a hierarchy. This is a necessary aspect of a

hierarchy viewed within the context of the supermatrix. On the other hand, the entry in the first row and last column of the above holarchy is nonzero, indicating that the top level depends on the bottom level.

In general, when feedback influences are present, the supermatrix is formed by laying out all the clusters and all the elements in each cluster both vertically on the left and horizontally at the top

$$W = \begin{matrix} & c_1 & c_2 & \cdots & c_N \\ \begin{matrix} c_1 \\ c_2 \\ \vdots \\ c_N \end{matrix} & \begin{pmatrix} W_{11} & W_{12} & \cdots & W_{1N} \\ W_{21} & W_{22} & \cdots & W_{2N} \\ \vdots & \vdots & \ddots & \vdots \\ W_{N1} & W_{N2} & \cdots & W_{NN} \end{pmatrix} \end{matrix}$$

with the following typical entry:

$$W = \begin{pmatrix} W_{i1}^{(j_1)} & W_{i1}^{(j_2)} & \cdots & W_{i1}^{(j_{n_j})} \\ W_{i2}^{(j_1)} & W_{i2}^{(j_2)} & \cdots & W_{i2}^{(j_{n_j})} \\ \vdots & \vdots & \ddots & \vdots \\ W_{i,n_i}^{(j_1)} & W_{i,n_i}^{(j_2)} & \cdots & W_{i,n_i}^{(j_{n_j})} \end{pmatrix}$$

where i and j denote the affected and affecting cluster respectively, and n is the element of the respected cluster. The entries of sub-matrices in W_{ij} are the ratio scales derived from paired comparisons performed on the elements within the clusters themselves according to their influence on each element in another cluster (outer dependence) or elements in their own cluster (inner dependence). Note that if the clusters influence and be influenced by other clusters, paired comparisons on the clusters are to be made as well.

The resulting unweighted supermatrix is then transformed into a matrix each of whose columns sums to unity to generate a stochastic supermatrix. The derived weights are used to weigh the elements of the corresponding column blocks (cluster) of the supermatrix, resulting in a weighted supermatrix which is stochastic. The stochastic nature is required for the reasons described below.

Since an element can influence the second element directly and indirectly through its influence on some third element and then by the influence of the latter on the second, every such possibility of a third element must be considered. This is captured by squaring the weighted matrix. But the third element also influences the fourth, which in turn influences the second. These influences can be obtained from the cubic power of the weighted supermatrix. As the process is performed continuously, one will have an infinite sequence of influence matrices denoted by $W_k, k = 1, 2, \dots$. The question is, if one takes the limit of the average of a sequence of N of these powers, will the result converge, and, is the limit unique? It has been shown that such a limit exists given the stochastic nature of the weighted supermatrix (Saaty, 2001).

There are three cases to consider in deriving W_k : (1) $\lambda_{max} = 1$ is a simple root and there are no other roots of unity in which case given the non-negative matrix W is primitive, we have $\lim_{k \rightarrow \infty} W_k = we^T$, implying that it is sufficient to raise the primitive stochastic matrix W to large powers to yield the limit outcome; (2) there are other roots of unity that cause cycling, in which case a particular condition known as the ‘‘Cesaro sum’’ is applied; and (3) $\lambda_{max} = 1$ is a multiple root, in which case the Sylvester’s formula with $\lambda_{max} = 1$ is applied (the formula allows limit priorities to be obtained from a reducible stochastic matrix W with $\lambda_{max} = 1$ being a multiple root). Hence, the powers of the supermatrix do not converge unless it is stochastic, because then its largest eigenvalue is one.

In practice, one simply needs to raise the stochastic supermatrix to large powers to read off the final priorities in which all the columns of the matrix are identical and each gives the relative priorities of the elements from which the priorities of the elements in each cluster are normalized to one. The resulting matrix is called limiting supermatrix. Hence, we used three supermatrices to synthesize the results of our survey: (1) the original unweighted supermatrix of column eigenvectors obtained from pairwise comparison matrices of elements; (2) the weighted supermatrix in which each block of column eigenvectors belonging to a cluster is weighted by the priority of influence of that cluster, rendering the weighted supermatrix column stochastic; and (3) the limiting supermatrix obtained by raising the weighted supermatrix to large powers.

Appendix D

Implementability and Monotonicity

The *social choice rule* (SCR) can be interpreted as a set of welfare optima derived from the maximization of social ordering over a feasible set in an Arrow social welfare function (SWF), or from selecting the Pareto efficient states, given individual preferences and characteristics. The problem is, agents' characteristics may not be known. Unless an incentive is provided, agents can be untruthful especially when they realize how the information they reveal is to be used. As discussed in the text, by utilizing the [revelation principle] and using a particular mechanism we can make the strategy of an untruthful state/profile declared by agents into a truthful equilibrium strategy. If the declared untruthful type θ'_i and its corresponding strategy s'_i are embedded in the original mechanism that contains truthful type and strategy $(s_i(\theta_i))$, the resulting equilibrium strategy s_i ($s'_i(\theta'_i)$) remains truthful (see again Fig. 3.2). That is, rather than being untruthful, agents want something that the social planners might have chosen had they known these characteristics right from the start. And that can occur only if they are truthful. Thus, the challenge is how to devise a mechanism that implements SCR whose possible outcomes in equilibrium all belong to the appropriate social choice set for the agent's true state/profile. This is known as the “*incentive compatibility*” problem (Hurwics, 1972).

A property of SCR that bears on the implementability is: “monotonicity” satisfied by the majority choice rule. This property imposes restrictions on SCR, among others it must exclude interpersonal comparisons of utility and revert to a kind of Arrow SCR.

Suppose we have two groups, say, ME and MSE, in which the preference profiles are identical. Then, monotonicity implies that the social choice sets must be the same. Given the MSE and ME preference toward two alternative strategies s_1 and s_2 in state/profile θ and θ' , respectively, the examples below show two cases, i.e., where monotonicity is satisfied, and where it is violated (maximum utilitarianism) (Tables D.1 and D.2).

Table D.1 Game example: monotonicity is satisfied

State/profile θ'		
	MSE	ME
s_1	5	2
s_2	2	4

Table D.2 Game example: monotonicity is violated

State/profile θ'		
	MSE	ME
s_1	5	2
s_2	2	6

State/profile θ		
	MSE	ME
s_1	5	2
s_2	2	3

$$\sum_{i=1}^2 u_i(a, \theta) > \sum_{i=1}^2 u_i(b, \theta)$$

$$a = f(\theta)$$

$$\sum_{i=1}^2 u_i(a, \theta') > \sum_{i=1}^2 u_i(b, \theta')$$

$$a = f(\theta)$$

$$\sum_{i=1}^2 u_i(b, \theta') > \sum_{i=1}^2 u_i(a, \theta')$$

$$b = f(\theta)$$

Notice that from state θ to state θ' the optimal strategy remains s_1 , and the ranking continues to show that MSE prefers s_1 and ME prefers s_2 . That is, the monotonicity property is satisfied. In the second case, however, the optimal strategy following the maximum utilitarianism shifts from s_1 to s_2 , and yet the ranking does not change. Hence, the monotonicity property is not met.

Expressed formally, consider SCR that can be interpreted as a correspondence from a set of possible state/profile θ to a set of possible outcome $f : \Theta \rightarrow A$

(set-valued function) and $f(\theta) \subset A$ where $f(\theta)$ consists of optimal outcomes in state/profile θ . In such a case, f is monotonic, provided that if $\forall \theta, \theta' \in \Theta$ and $a \in f(\theta)$, that is, if a is optimal in θ , then after we change the payoff function $u_i(a, \theta) \geq u_i(b, \theta) \Rightarrow u_i(a, \theta') \geq u_i(b, \theta')$ for all i and b where u is utility. In other words, a must be optimal in θ' too. Thus, after the change in the payoff function, if agent i prefers a to b in state θ for any b , he/she will continue to prefer a to b in state/profile θ' (a is optimal in θ').

Appendix E

Radar Charts of SC-Compatible Policy

See (Figs. E.1, E.2, E.3, E.4, E.5 and E.6).

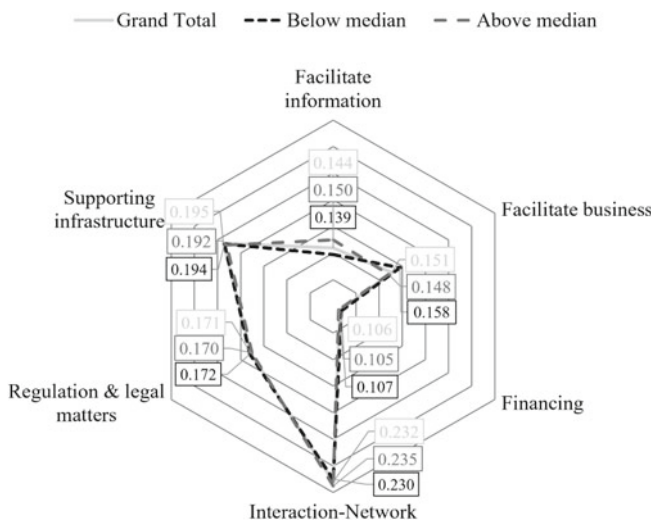


Fig. E.1 MSMEs' policy preference: Duration of firm operations

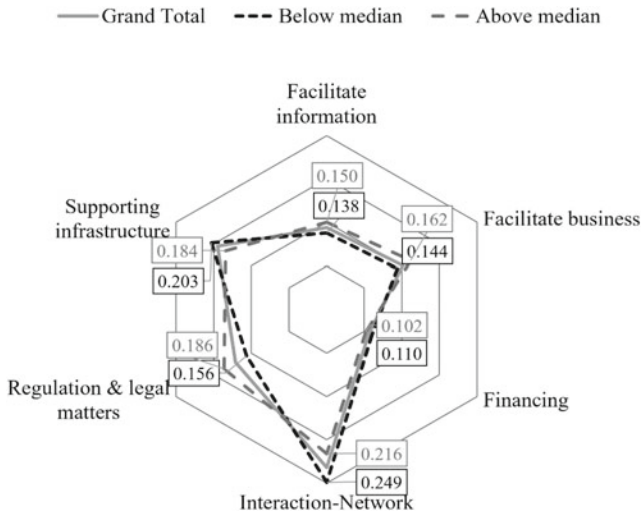


Fig. E.2 MSMEs' policy preference: Duration under BI supports

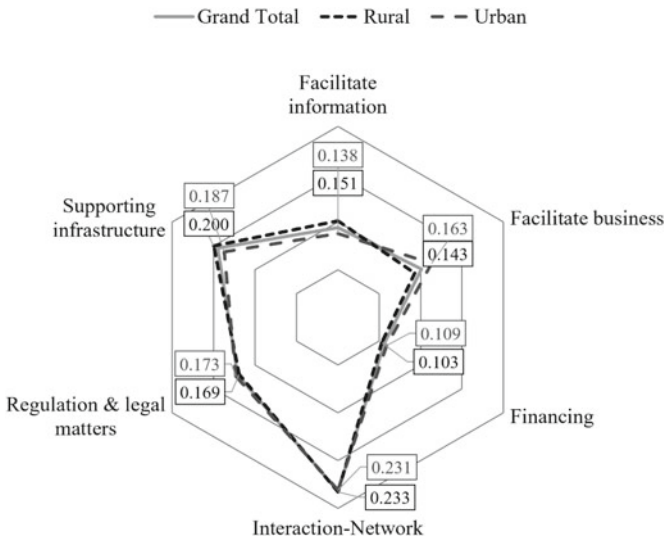


Fig. E.3 MSMEs' policy preference: Rural-urban

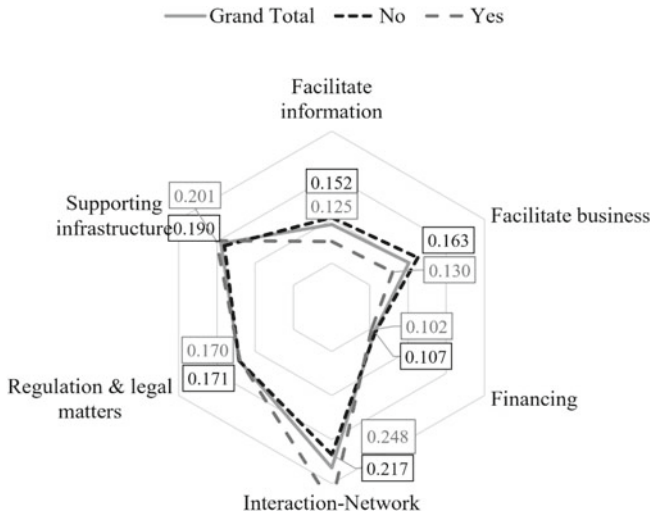


Fig. E.4 MSMEs' policy preference: Size of profit change

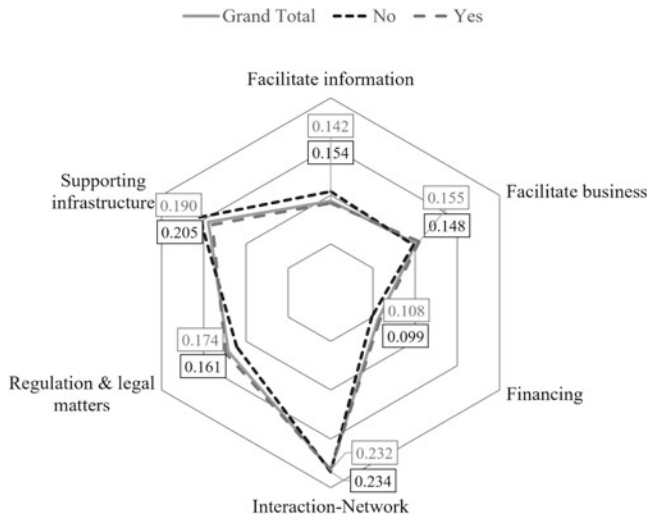


Fig. E.5 MSMEs' policy preference: Digital use

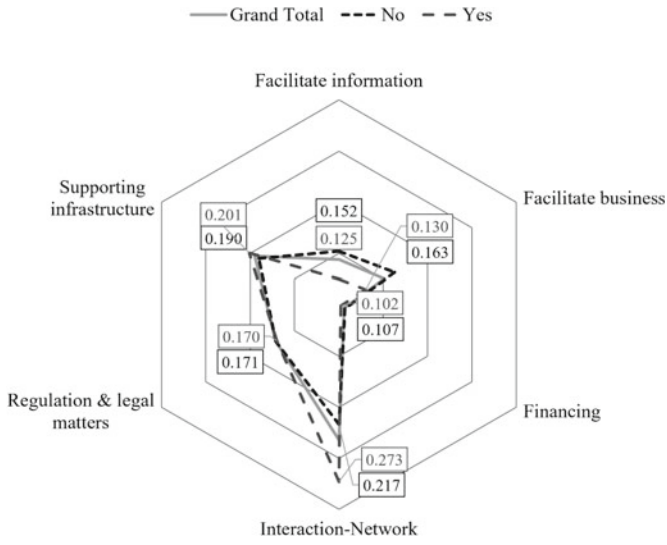


Fig. E.6 MSMEs' policy preference: Export

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