

Developing a Hypothetical Model for Social Innovation Creation

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This study builds a hypothesis model for social innovation creation. Many local regions will face endogenous economic development from low birthrates and an aging society in the near future. Under these conditions, the industry-academia-government collaboration will contribute to realizing endogenous economic development. Usually, industry-academia-government collaboration is based on science and technology. Local regions require academic knowledge in the social sciences. However, the problems of local regions cannot be solved using technological approaches, and the creation of social innovation is required to solve social issues of local regions. I believe that this study makes a significant contribution to the literature because I demonstrate through a literature review that the problems of rural communities cannot be solved using only technological approaches. The analysis demonstrates the necessity of social innovation through partnerships, networks, and collaboration to solve the issues of local regions.

Keyword: Social Innovation, Endogenous Economic Development, Social Science, Local Region Industry-Academia-Government Collaboration,

1. Introduction

The purpose of this paper is to develop a framework as a hypothetical model for industry, academia, and government collaboration for social innovation creation (Kiyoshi, 2020). Social innovation is “innovation that creates new social value and brings economic and social results through business that solves social issues” (Tanimoto, 2013).

In rural areas, the pressing issue of regional decline has come to the fore. Low birth rates and aging populations are advancing faster in rural areas than in metropolitan areas, and the number of areas facing social issues such as the decline and marginalization of local communities is expanding. From the perspective of university knowledge in social sciences, the creation of regional revitalization through industry-academia-government collaboration activities related to local for-profit enterprises (such as community business) is important. This is because social problems cannot be solved using only industry-academia-government collaborations based on science and technology solutions.

However, in Japan, at present, there is no clear organizational scheme for contributing to local communities by making better use of university functions (education and research) in the social

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science field. This means that the solutions to social issues are not being promoted effectively. Therefore, we built a hypothesis model for social innovation creation based on models created in other countries, such as Thailand.

To achieve this paper’s goal, we conducted a detailed case analysis of examples from other countries facing similar problems related to the decline and marginalization of local communities to provide suggestions on the development of the model. Specifically, the analysis focused on community businesses and the role of local government and higher education institutions contributing to local communities in Thailand. Especially in rural areas in Thailand, economic development has not been achieved, which overlaps with social problems, such as the decline of Japan’s region-based higher education institutions and the search for solutions.

To solve these social issues using the functions of social science (education and research), this research addresses the current situation in which the issues to be solved are urgent because the local decline has become prominent using an organizational framework. Figure 1 illustrates small social enterprises that have started businesses in declining local areas and demonstrates the significance of this study. The vertical axis, Y, illustrates productivity improvement, and the horizontal axis, I, illustrates investment in new technology, new service, and education. In the beginning, as demonstrated by the path from I_1 to C, the productivity of the enterprises will increase because of the new concepts, but the curve demonstrates the possibility that there might be a decline in the whole market due to the change in needs and the lack of demand due to the decrease in

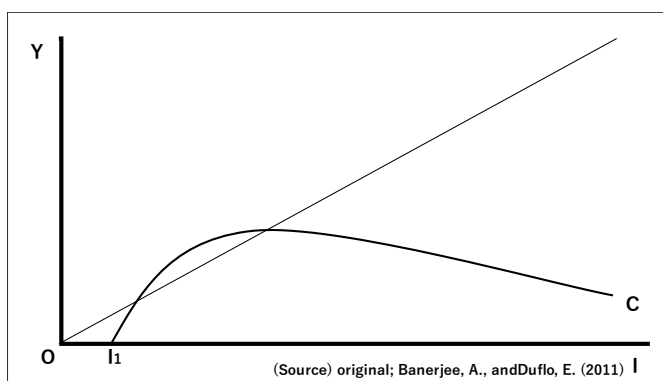


Figure 1 . Productivity of small social enterprises

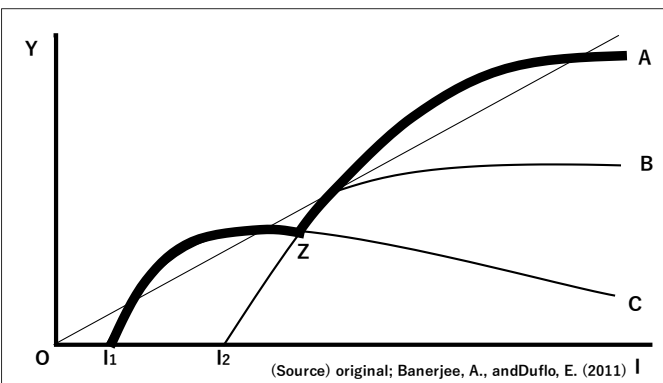


Figure 2 . Productivity of small social enterprises: Open Innovation

population.

In Figure 2, the I_2 point indicates that new knowledge, such as new technology or new services, has been invested by co-creation and collaboration. The I_1ZA path is the curve for this development. In other words, open collaboration with customers, universities, and the government improves productivity. In the case of a manufacturer, the increase in capital strength through investment is also an increase in production capacity, and expected sales and profits are theoretically high. In reality,

investing does not necessarily lead to improvements in productivity and involves uncertainties, such that I₁ZB can occur. However, many small-scale social enterprises in rural areas have difficulty investing in new technologies, new services, and education by themselves because they do not have the capacity. Therefore, at point I₂, it is desirable to realize open innovation through collaboration with universities and local governments.

By realizing the introduction and investment of new technologies, services, and education through collaboration with universities and local government based on the I₂ point, the curve can be turned into I₁ZA. The realization of this is the significance of conducting industry-academia-government collaboration. In particular, if it is possible to realize broad investment by a company in the form of taking advantage of university functions (education and research) in the social sciences field that could not be implemented until now, it would be possible to achieve the I₁ZA curves. In other words, a business model that can achieve commercialization by utilizing technology must be created from the knowledge of social sciences. It should be possible, and the realization of this makes this study unique and creative. The development of a hypothetical model for social innovation creation fills the gaps in the literature on this subject. After this goal has been achieved in this thesis, the hypothetical model will be substantiated in further research that will include the collated and analyzed data.

2. Literature Review

Creating social innovation requires a foundation. Innovation systems, which can be called the foundation or the soil, and can be broadly classified into national and regional systems of innovation. According to Freeman, the former is “the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify, and diffuse new technologies” (Freeman, 1987, 1). In a broad sense, this relies on a large government to provide a framework for the enforcement of science and technology policies and promote intellectual property strategies and industry-academia-government collaboration as policies. In contrast, the latter are more localized autonomous systems. Discussions are held on regional industry clusters consisting of interconnected individual private organizations (such as companies) with geographical proximity and autonomous industry-academia-government collaboration that has been incorporated into the region.

Cook’s (1997) research is representative of the regional innovation system. As an innovation system that refers to technology transfer and commercialization from universities, collaborative interaction in the local regulatory system based on trust is also a social process and provides feedback to the innovation process as knowledge development (Cook, 1997, 475–491). This triple helix is a theory of industry-academia-government interaction as an innovation system with universities as the

driving force of knowledge-based societies aiming to develop companies based on advanced university technologies (Etzkowitz, 2008).

The central actor in each area of discussion is the company. The innovation system is also a place to realize the knowledge creation process through actor dynamics, and the significance and role of universities, which can be called the bases of regional knowledge, will increase. Revitalizing this knowledge creation process further is the goal of corporate research and development. As the university is a research institute, it is possible to support a company's technological development process. Subsequently, this study builds a hypothesis model for social innovation created through the social science academic fields.

3. Method

3.1 The analysis framework

For the “creation of an industry-academia-government co-creation framework for social innovation creation,” to clarify as an Analysis framework, the composition of what kind of characteristics between industry and academia leads to the achievement of purpose. Usually, the collaborating government is positioned so that industry-academia activities mainly exist through government support; therefore, the government's position when developing this hypothesis model should be set aside. As this research aims to realize the development of regional areas through industry and academia collaboration, ① (Community Business Success [Industry]) and ② (University's Contribution Success [University]) are the independent variables. ③ (Creating Social innovation Success) is the dependent variable to achieve regional development through both areas, and conduct each prior research review.

It can be hypothesized that the realization of each success of ① and ② can lead to the realization of ③. In other words, the independence of the community business in the market, and the achievement of the contribution of the university to the community in the area, together with the technology and social science domains, will lead to the creation of innovation in the community. This was demonstrated using a covariance structure analysis to analyze the relationship between the multiple constructs with ①→③ and ②→③ as the axes.

This research aims to demonstrate that creating social innovation should be based on developing an endogenous region in the market economy. Therefore, for the surveys related to ①, ②, and ③, which are the central areas of this research, a quantitative survey was conducted using questionnaires with people involved in community businesses. The results of the questionnaires were examined using a covariance structure analysis, and a framework was developed. Additionally, the administration and a single university in one regional area were analyzed. Subsequently, a qualitative survey through interviews to highlight the specific situation was also conducted. Then, the businesses and their

cooperation situations were surveyed through interviews and participant observation for more information on the extracted community businesses surveyed using the previous questionnaire. This was performed to add qualitative information and create more realistic results.

As described above, the quantitative results and the qualitative situation from these case studies were considered. The factors that will increase social innovation can be created through a collaboration between industry, academia, and government in the social sciences fields. This led to creating an industry-academia-government co-creation framework, which is the main aim of this research.

To connect to the main factors (potential variables and observed variables) that ①, ②, and ③ are based on, first, the research areas of ①, ②, and ③ were clarified, and a subdivision was performed. From which, the results were interpreted using an accurate factor extraction as follows:

①→③ implies that ① had a positive effect on ③,

②→③ implies that ② had a positive effect on ③, and

①↔② implies that ① and ② had a positive effect on each other.

3.2 Previous research areas

Three subdivision areas of “Bottom of the Pyramid (BOP),” “Development/Relationship,” and “Creating Shared Value (CSV)” were set for ①. The bottom of the pyramid (BOP) refers to about 4.5 billion poor people at the base of the world economic pyramid, who live on approximately USD 8 per day (Prahalad, 2005). Although Ladkrabang, Thailand, the study area of this research, does not have many people living in poverty, the regional income is relatively low compared to the neighboring central Bangkok area. We set this as a useful foundation for social innovation creation for businesses in low-income groups. With regard to the development/relationship, the relationship between competition and cooperation is evident in developing regions, and the existence of a business-to-business network and a sense of belonging to a community have already been clarified (Saxenian, 1994). The Creating Shared Value (CSV) concept enables companies to improve their competitiveness and, at the same time, solve social issues. In particular, as Lakaban is not necessarily a development area, each community must have a perspective on developing businesses after overcoming local social issues in business development as they cannot develop unless they create themselves.

For ②, because of the collaboration on science and technology and the collaboration of social sciences dealt with in this paper, the former case is “Open Innovation” and “University-Industry Collaboration.” The latter case was set as “Social Innovation” and “University-Community Collaboration.”

Recent trends in collaboration in science and technology have not been based on the premise of all development and business processes within a company to achieve the product development as desired by the customer, but are developed by co-creation and alliance with the customer. This relationship should be promoted. Uncertainty is growing as we do not know what to create, so co-creation and collaboration beyond current ideas and technologies are required. Therefore, we set up open innovation and university-industry collaboration in theory and practice, respectively.

In social science cooperation, I aim to create social value widely and realize sustainable regional societies, including in areas that cannot be covered by the development of industrial society by science and technology. Here, although a business model with aspects as a social business and the normal for-profit business model is required, its realization is based on the premise that it is based on the market economy. It also requires co-creation with highly functional universities. It will be necessary to follow local district organizations as necessary, but the central focus of the discussion is not the macroscopic outline but the dynamic behavior of individual company-academia-government management. Therefore, we set up social innovation and university-community collaboration in theory and practice, respectively.

㉞ was positioned as an aim in this paper, and in particular, whether it will become a situation where innovation is created in the local community or not. However, the academic definition of the regional innovation system is unclear. It is a relatively new research area used since the early 1990s from prior research, as described later. Regional development through industry and creating innovation as a regional system are common research areas. I discuss the theory of the institution's customs and norms by examining each organizational function; industry, academia, and government cooperation; technology development; human capital and knowledge; regulation; and the viewpoint from which they are utilized. This demonstrates the competitive advantage of the region.

Rural regions are not as mature as a market (producer and consumer), and it is important to understand how to overcome the various difficulties of creating innovation to provide products and services. The chain-linked model, which models how development results are put into the market, can be considered as a paradigm based on open innovation, the current trend, which is the flow of knowledge that is the source of innovation creation. Interaction and autonomous dynamics also utilize the external network, and therefore, a detailed division of "Knowledge Creation" and "External Network" was necessary.

In the next section, a review of each previous research area will be detailed, and the factors (potential variables and observed variables) of ㉞, ㉟, and ㊱, as described above, are outlined. This is based on the following general points:

㉞ - Bottom of the Pyramid (BOP)

- Development/Relationship
- Creating Shared Value
- Ⓑ - Open Innovation
 - University-Industry Collaboration
 - Social Innovation
 - University-Community Collaboration
- Ⓒ - Knowledge Creation
 - External Network

4. Previous Research

4.1 Community business success

4.1.1 Bottom of the pyramid (BOP): Market access of low-income layer

The bottom of the pyramid (BOP) was defined by Prahalad (2005), as the people at the bottom of the economic pyramid living on USD 8 a day. Prahalad also pointed out that turning people living in poverty into customers can create a larger market (Prahalad, 2005, 3–22). This is not a charitable approach to the BOP, but a financial approach in which people in the BOP layer are viewed as customers, and their needs can be met to increase profits. The success of this approach is that the BOP layer develops into the middle layer, and the population structure can begin to shift from a pyramid to a diamond (Prahalad, 2005, 109–112).

Prahalad argued that the following five points are the characteristics of the BOP market: 1. The BOP has money, 2. BOP market access is difficult, 3. the BOP market is brand-oriented, 4. BOP layers are connected (to each other), and 5. BOP consumers accept advanced technology (Prahalad, 2005, 10–16). Additionally, Prahalad argued that to turn the BOP market into a true consumer market, the following four steps are required: 1. Create consumption power, 2. meet the needs of new products and services, 3. presence of self-esteem and choice, and 4. confidence is a prerequisite (Prahalad, 2005, 16–21).

As a new BOP strategy, Ravn advocates the creation of a consortium (access2innovation [a2i]) consisting of NGOs, as intermediaries for the BOP market, and companies and researchers in the private sector to understand the needs in developing markets (Ravn et al., 2009, 838–850). Through these collaborations, and by developing knowledge, building a network, and raising funds, it is possible to develop products and services that contribute to society. Through close collaboration with NGOs close to the end-users of local communities, the solution is based on the relationship of corporate technology and services, and their adaptation and development by researchers.

Jakki points out the need to meet needs with a customized approach to the BOP market. It should be noted that companies accessing the market should be aware of startup venture companies in a manner that is conscious of improving consumer profits to BOPs by reinvesting profits and not maximizing shareholder profits (Jakki, 2012, 4–14). Shyam et al. developed a model for a successful social enterprise for the sustainable livelihoods of the BOP and included health, opportunity, peace, education, infrastructure, and microfinance (HOPEIM) as the key elements. Their model is based on modifying the “Business Model Canvas” (Osterwalder and Pigneur 2010) from the traditional for-profit company model. This idea focuses on social value and social benefit, and so the primary goal is to determine whether customer benefits lead to social benefits (Shyam et al., 2013, 269–292). Rahman used the business model of Grameenphone, a major telecommunications company in Bangladesh, as a case study to demonstrate the BOP market. Rahman demonstrates that Grameenphone helped expand the market while reducing poverty and contributing to social benefits (Rahman, 2014, 41–53).

Caneque and Hart (2015), who have worked with Prahalad, organized these approaches to the BOP market as follows. If BOP 1.0 is recognized as a consumer and services such as sales are provided as BOP 1.0, then it is assumed that BOP 2.0 is the stage in which the BOP is recognized as a partner and co-created. BOP 3.0 demonstrates how to proceed further, and considers business as an ecosystem, and aims to achieve both economic efficiency and sociality through the collaboration of multiple organizations.

From these arguments, low-income people can be seen as a business opportunity. In other words, companies can make the community rich (poverty eradication) by raising profits, and are the market access’s content for low-income groups (a latent variable that is a primary factor with \textcircled{A} as a secondary factor: Market Access (ma): Companies must enter the market). It aims to create a new market economic system, and it is thought that the market mechanism can cover an area that cannot be solved by market principles. According to Prahalad, the BOP market has distinctive features that are different from the image held of the low-income segment, which has high levels of purchasing power, high potential as a sales channel, and is brand-oriented and made up of connected consumers, both through the Internet and society. He pointed out that advanced technology is accepted without difficulty, and in recent years, the approach to the same market has also been discussed from the viewpoint of achieving open innovation and sustainable regional development (Observed variable: Response to questionnaire: Figure 4, responses 1, 2, 3, 4, and 5).

4.1.2 Development/Relationship: Community development in Thailand

According to Pramongkita et al., industrial development in Thailand came after the export substitution industry development policy that began in the 1960s. Essentially, Thailand fostered local industries

as part of national industrial development. However, due to the limited size of the domestic market, a policy change was made towards economic growth, and the emphasis was placed on export-led industrial development (Pramongkita et al., 2002, 89–101.)

Hewison discusses the historical context in which Thailand used to be an agricultural society and was incorporated globally into a capitalist economic society. Thailand's capitalist development is rapid and has brought about major social change. While the elite has struggled to maintain their economic, social, cultural, and political influence in this transformation, new elites and subordinate groups have emerged, creating a larger gap between high-income and low-income groups (Hewison, 2006, 72–106).

Chen states that this capitalist economy has been dominant, and after Thailand's financial crisis, the state has become more focused on regionalism and localization. Since 1990, countries worldwide have emphasized globalization, and Thailand has also attempted to restructure its financial system to increase foreign currency for investment. However, regulations throughout Asia, including in Thailand, were underestimated, which led to the 1997 Asian financial crisis. Subsequently, while for Thailand, economic recovery and development became the top priority, discussions on regionalization and localization proceeded, emphasizing direct investment.

Today, regionalism is an important concept of the international system, divided into "open regionalism" and "closed regionalism." Open regionalism emphasizes the relationship between the state and the global market, and regionalization is positioned as a complementary step to support participation in the globalization process. The regionalization process can be considered a transition period for globalization, and regionalization does not conflict with globalization. Additionally, closed regionalism focuses on the relationship between the state and society, emphasizing non-economic values such as distribution and social justice, and asserts the importance of domestic capital (Chen, 2014, 62–79).

In their research on community development in Thailand, Ruangkrit et al. examined the characteristics of entrepreneurs in Chiang Mai, which is a city that attracts many tourists but is also an important agricultural area for tea, coffee, flowers, fruits, and vegetables. Most Thai people living in Chiang Mai are farmers and entrepreneurs. The Thai government has the policy to promote entrepreneurship and has developed an entrepreneurship environment by providing training, guidance, and lending. As a result, most entrepreneurs in Chiang Mai were married women aged 50 and over, who are considered as entrepreneurial risk-takers. Although they were opportunistic, they were able to set goals and seek information, make plans, track tasks, and manage and evaluate their work. However, in this study, the results demonstrated that no persuasion and network were required to improve their efficiency (Ruangkrit and Thechatakern, 2015, 58–74).

The Thai government has been promoting one-tambon one product (OTOP) since 2001 to promote community enterprise (Santipolvut and Sripruetkiat, 2012). OTOP's entrepreneurs have developed steadily but are limited, and the market needs to create competitive community enterprises to contribute to Thailand's community development. To that end, the following are required: 1. As a production guideline: the development of a new generation of leaders, preparation for development technology independence, support in waste management, and support for product standardization; 2. as marketing development guidelines: products at the regional level and national level through the establishment of a sales expansion center, promotion of international export, development of product design/packaging, and promotion of e-commerce; and 3. business development guidelines: The promotion of an industrial cluster and the knowledge management of community enterprises (Santipolvut and Sripruetkiat, 2012).

For the direct community development in the region, Morrison argued that community prosperity relies on open networks. It should be noted that the amount of money in the community has increased. Communities are organized around networks, not hierarchies, and the openness of people, things, and money are essential for their development (Morrison, 2012, 156–177).

From the perspective of small businesses designing business models in the region, Tamminen describes the value of the community. Communities are usually geographically and culturally similar (such as hobbies and occupations) and are characterized by a common connection among its members. There is a positive correlation between “trust” and “cooperation,” and values act as the “paste” in the community, connecting community members, creating a common way of working, and promoting happiness. If you want to offer competitive products and services to your customers, then there is an advantage not in just setting up small businesses but also through applying a joint approach to sharing and creating positive experiences with the community. With trust, the value of effective collaboration can introduce new products and services to customers who were unaware that such a product existed, thereby creating new business opportunities (Tamminen, 2014, 1–20).

However, donors have pointed out that weak industrial-academia ties are the reason for the remaining vulnerability of their industry and workers for the growth of economic advancement. An important source of information when companies conduct R&D in Thailand is not a university or public research institute but is rather an innovative company. Thailand's higher education system has expanded, but there is poor access to higher education by low-income and rural citizens; secondary education is focused more on college admission than on vocational training, which is necessary for the labor market; and the research level of the Thai universities is lower than the level required by industry (Doner et al., 2013, 213–229).

This is the foundation of the development of the area for the local communities, and this is not a hierarchical but a network, to realize richness in an open regional economic zone (a latent variable that is a primary factor with ㊦ as a secondary factor: Network [ne]: It is necessary to be able to achieve regional network construction). As a premise of this, the existence of “trust” in the community will be the key to producing results from co-creation (Observed variables: Response to questionnaire: Figure 4, responses 6, 7, 8, and 9). It is important to increase local circulation, that is, to create added value in the community, reinvest, and create new business opportunities. The government’s involvement (subsidy) is useful for business creation, as in OTOP, but for developing a self-sustaining regional economy, the creation of new businesses by business entities is constantly required. This is not from other regions, and the simple importing of business models from high-income countries will not work. The model should aim to improve incomes in a market-economy-based system without relying too much on government subsidies (a latent variable that is a primary factor with ㊦ as a secondary factor: Autonomy [au]: It is necessary that business development can be realized with autonomy; Observed variable: Response to questionnaire: Figure 4, responses 10, 11, 12, and 13).

4.1.3 Creating shared value and value co-creation

Creating Shared Value (CSV) is a term established by Porter and Kramer and indicates that a for-profit company can provide solutions to social problems through its main business. In other words, the opposing concepts of “economic value” and “Social value” can be co-created. So far, companies aiming to maximize profits have not focused on social issues. If a company incurs social costs, such as pollution, penalties, and taxes, it must be made to internalize such negative externalities. In this way, the response to social issues has been transferred to the role of governments and NGOs. The activities related to corporate social responsibility (CSR) were positioned as the necessary expenses for improving a company’s reputation.

Conversely, the concept of CSV recognizes not only economic needs but also social needs, and determines the market. As the internal cost to solve social problems can be improved by new technology, it will increase productivity and expand the market. The shared value does not share the generated value but expands the integrated pool of economic and social value. To solve social issues, Porter et al. considered the need to create next-generation products and services, including all corporate activities in the value chain, improve the entire value chain, and improve productivity. To be successful, these activities must occur within a community. In this way, the concept of shared value was defined as enhancing the competitiveness of a company while simultaneously advancing the economic and social situation in the community (Porter and Kramer, 2011, 62–77).

Moon et al. extended the CSV theory by taking into account corporate and social interests, using four types of companies to develop a model framework: a “silly company,” “selfish company,”

“good company,” and “smart company.” They argued that organizations and companies should aim to be a “smart company,” as this provides the highest economic and social benefits (Moon et al., 2011, 49–64).

Pimpa et al. referred to the concept of social responsibility in enterprises in Thailand. This concept in Thailand is not particularly new because Thailand has a guardian-client culture, and the top members of society need to ensure the welfare of the lower classes through charity, charity, sponsorship, and volunteerism. However, lower members have to be respectful and loyal in return, while benefiting from this relationship. It is a common practice in Thai society to give back to society, which is strongly related to Buddhist philosophy. According to Pimpa et al. ’s survey, only 30.46% of 4,350 business organizations surveyed in Thailand understood the concept of corporate social responsibility, but more than 60% already understood this as a result of the deep cultural connections (Pimpa et al., 2014, 1–14).

In recent years, Ishak argued that larger companies are better for creating CSVs and used the case of the Araya Group, the largest group of companies in the Philippines, as an example. CSV can help large companies to increase profits and grow, while at the same time, it can solve social issues and create value. This suggests that large-scale companies and international business groups have more impact on society, and advanced technologies, scale benefits of production, and strong marketing power make them fulfill more social obligations. It is assumed that value creation also occurs through this process (Ishak, 2018, 392 –410).

What can be understood from these arguments is that developing economic and social values can be achieved by developing the BOP layer that was not recognized as a market until now, and this leads to meeting the needs of societies (a latent variable that is a primary factor with ㊦ as a secondary factor: Social Value & Economic Value [se]: It is necessary to have a spirit that aims to balance economic value and social value). The traditional view of the company is that it contributes to society through tax payments and employment from rising corporate profits. However, providing in-house products and in-house services as for-profit companies leads to solving social problems. Therefore, business success relies on enriching society, and this goes beyond the idea that only governments and NGOs should consider social development. In particular, large capital companies are more socially influential, but there is also space for community businesses to influence society, although they must be closely related to the region over a long period. Thailand has historically been rooted in a culture of social contribution based on religious views, and in that sense, it seems that it has a solid foundation or a rich soil for the cultivation and promotion of CSV (Observed variable: Response to questionnaire: Figure 4, responses 14, 15, 16, 17, and 18).

4.2 University contributions

4.2.1 Open innovation

As advocated by Chesbrough, open innovation is defined as “a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology” (Chesbrough, 2003). In other words, external knowledge is utilized in line with the company’s purpose, not through closed innovation, but through partnerships and joint research with various organizations other than the limited collaborations identified so far. This process contributes to the company’s innovation creation.

The debate on open innovation has centered on Chesbrough’s definition; however, Chesbrough has underestimated the concept of openness, based on Chandler’s traditional business strategy and Porter’s competition strategy, and how to use it in business strategy beyond the technical domains. Chesbrough proposes that strategic theory requires a new approach that includes openness (Chesbrough and Appleyard, 2007, 57–76).

Furthermore, Chesbrough argued that the dynamics of technology development should be reflected in the dynamics of corporate networks as a concrete measure for openness. As the interaction between the components in the early stages of technology development is unknown, it is impossible to build connections to explore alternative technology solutions. Therefore, sharing technology through modularization is suitable for technology utilization networks with customer companies and suppliers (Chesbrough and Prencipe, 2008, 414–425).

For Chesbrough, making use of such technology should be built as a business model interacting with engineering, marketing, sales, and finance. Technology that has not been marketed through business models has no objective value and only has a potential value. Subsequently, mediocre technology pursued through a successful business model may be more valuable than the superior technology brought about through mediocre business models (Chesbrough, 2010a, 354–363).

Chesbrough also argued that services must be innovative. Services are now at the core of a growing business, and Apple’s iPod and iPhone are examples as they are no longer in the product category but as a platform for customers as they offer a variety of services. Consequently, rival companies cannot compete by creating superior products and instead must focus on service innovation (Chesbrough, 2010b, 577–599).

Gassmann, along with Chesbrough et al., refers to the future of open innovation. He stated that there are nine major innovation flows, and it would be desirable to reorganize these from different perspectives: 1. The spatial perspective has led to research on the globalization of innovation. (near-location becomes a promotion of innovation); 2. The structural perspective indicates that work division has increased through innovation (innovation by outsourcing R&D and alliance creation); 3.

The user perspective (capturing potential customer needs); 4. The supplier perspective (innovation through supplier integration); 5. The leveraging perspective (increased possibilities through other capital utilization); 6. The process perspective (outside in, inside) and (outside, coupled existence); 7. The tool perspective (requires tools such as technology and ideas to open the innovation process); 8. The institutional perspective (open innovation is a private collective innovation model); and 9. The cultural perspective (respect for external culture and ability; Gassmann et al., 2010).

On the above arguments, Chesbrough talks about open innovation as “a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization’s business model” (Chesbrough and Bogers (2014)). It is not only a theory for technology companies, but it has also been widely applied.

From these arguments, it is also important to understand the value of the customer and combine the customer needs with the company’s technologies and services to realize the provided co-creation service (a latent variable that is a primary factor with ㊦ as a secondary factor: Cooperation [co]: Universities need to work with companies to create something). The acceptance of services provided by companies in the market is based on the achievements and expectations that previously unsolved issues can be solved; in other words, creating “customer value (semantic value)” to establish a relationship with the customer. This will openly collaborate with various organizations outside the company (Observed variable: Response to questionnaire: Figure 4, responses 19, 20, 21, and 22). Industry-academia-government collaboration also aims to develop new technologies through organizational collaboration with different goals and values and represent the open innovation framework. However, there are many cases in which industry-academia-government collaboration has so far been carried out by role assignment or one-way requests from companies, and in many cases, collaboration has not been realized in a true sense.

4.2.2 University-industry collaboration: Technological collaboration

Janschek et al. stated that collaboration between industry and academia could be useful, especially in small and medium-sized enterprises because they can share their knowledge and change their business direction. The definitions of each transfer from the university to the company were organized as follows. “Research transfer” is defined as applying the results of scientific research in nonscientific fields. “Knowledge transfer” is defined as creating useful things in one organized setting, and the process by which knowledge about execution is used within another organizational context. “Technology transfer” is generally regarded as the movement of technologically relevant knowledge among partners to enhance the competitive advantage of partners (Janschek, 1998, 23–30).

Intarakumnerd et al. also acknowledge the role of universities in low-income countries, where universities can play an important role as a source of knowledge. Technology and organizational forms in high-income countries can be absorbed locally and produce appropriate technical inputs in close cooperation with local companies. Successful industry-academia technology cooperation will help local companies to accept, modify, and disseminate technology. This follows the Triple Helix approach (Etzkowitz, 2008), which is representative of industry-academia-technology collaboration. Industry-academia-technological collaboration is necessary to promote direct collaboration with industry to license university technology and utilize knowledge. However, these concepts are the inheritance of mature industries from high-income countries, or the labor-intensive part of the value chain from high-income countries and their adaptation in low-income countries is limited.

They also refer to companies and universities in Thailand, where multinational companies, large-scale domestic companies, and a small number of small and medium-sized enterprises have research and development capabilities. However, most of them have difficulty improving their design and engineering capabilities. In particular, it is important to construct basic operations in many SMEs. The slowness of technological development in Thai companies is completely different from Japanese, Korean, and Taiwanese companies that have transformed from imitators to innovators. Universities mainly focus on undergraduate education, and budgets for research and development is 0.26% of GDP (2002 annual, 2004 IMD data; major high-income countries are around 0.7 to 0.9%). Therefore, human resources responsible for research and development are in short supply, and the creation of research results (publications such as academic papers) is insufficient, although according to the data of the Science Citation Index (SCI), it is increasing. Although the percentage of research results in the agricultural science field is high, the engineering field needs to be strengthened (Intarakumnerd and Schiller, 2009, 552–589).

Fuentes and Dutrénit concluded that collaboration between industry and academia has three stages: 1. Involvement in collaboration, 2. communication by collaboration, and 3. benefits from collaboration. The promotion of strong collaboration is the creation of knowledge and is also an important function for low-income countries as it can promote a circle of proliferation (Fuentes and Dutrénit, 2010, 1–35).

Malik and others focused on how low-income countries have attempted to promote collaboration between universities and industry. More broadly, companies operating in Thailand generally do not have a strong interest in industry-academia-government collaboration. Thailand's strategy of linking protection in the Thai domestic market to the export of natural resources and low-wage products reflects the competitive threat to Thai companies. Consequently, in advanced research areas, the enthusiasm for pursuing a partnership with universities is considered low. Thai universities

are also characterized by the inability to make closer ties with the private sector. Although the private sector has become linked to universities, Thailand's education infrastructure has few incentives and institutions for such links, with a few exceptions. For example, it is important to find the right person to manage the university-industry interface, and it is also important for university faculty members to manage the relationship with private sector companies. However, university faculty members have to be restrained during semesters and dissertation writing periods. A more rapid conversion is expected (Malik and Wickramasinghe, 2015).

From these arguments, industry-university technology cooperation is useful even in small enterprises in the region. Rapid business development can be realized if companies can obtain technical resources that are lacking when they seek new business development from regional higher education institutions (a latent variable that is a primary factor with ⑥ as a secondary factor: Knowledge Transfer [kt]: It is necessary to be able to realize knowledge transfer from university). In industry-university technology cooperation, role-oriented technology development between universities and large companies has been mainstream, but for innovation creation in an increasingly uncertain future situation, cooperation promotion by co-creation and not role sharing is desired (Observed variable: Response to questionnaire: Figure 4, responses 23, 24, 25, and 26). To achieve this, it is also necessary to maintain a continuously functioning industry-academia interface. Even in developing regions, cooperation in the field of technology development towards commercialization is desirable. However, in regions where there are likely to be many weak companies, business promotion should be managed after technological development that should be originally performed by companies; for example, using higher education resources other than technical resources such as marketing. It is also hoped that industry-academia relationships should be developed to co-create a method for promoting that specific situation.

4.2.3 Social innovation

Research on social innovation is multifarious and abundant. Here, I would like to expand on the suggestions in this chapter. Gershuny mentioned social innovation in discussions that provide an analytical framework for the impact of Telemax technology on future industrial employment patterns. New offerings for household services are said to bring about social change, and new technologies enable innovation in service delivery areas that have not seen any change (Gershuny, 1982, 496–516).

Hazelcorn advanced the debate in terms of activities to create better communities. Although many innovations have been derived from science and technology, in recent years, the creative industry (such as Google or Apple) has demonstrated remarkable growth and requires new concepts to express close links with innovations in a broader economic society. For detailed explanations on issues such as the economic effects of spending on creative services, Hazelcorn discussed innovation

that causes social and economic change (Hazelkorn, 2009, 1–12). Hazelkorn used Phil’s concept of social innovation as follows: “truly social only if the balance is tilted toward social value – benefits to the public or to society as a whole – rather than private value – gains for entrepreneurs, investors, and ordinary (not disadvantaged) consumers.” (Phills Jr et al., 2008, 34–43). He also mentioned the role of higher education, local government, national organizations, nonprofit organizations, and corporate alliances in response to diverse regional issues. Multidimensional, collaborative, and distributive ideas are fundamental to this collaboration as this leads to solving problems. Rather than looking at innovation due to being commercialized, it was viewed as a complex iterative process involving stakeholders from the private sector, the public sector, and the broader civil society. Higher education contributes to the community beyond volunteer activities, and beyond traditional industry-academia-technology collaboration, it will build higher educational relationships with local stakeholders (Hazelkorn, 2009, 1–12).

Preskill noted the importance of evaluating social innovation. In the last few decades, philanthropic efforts to produce larger and more sustainable results have faced increasingly complex problems without solutions. Preskill points out that traditional program grants alone cannot solve the stubborn problems many funders are attempting to address. As a result, nonprofit organizations are trying to create promising social innovations such as system construction, policy advising, cross-sectoral collaboration, and network construction. However, practical implementation of the core principles of strategic philanthropy (e.g., attention to performance criteria and assessment of progress towards desired outcomes) often violates social innovation. Therefore, as a strategic learning approach to decision-making and action, the relationship between strategy and evaluation should be recognized, and the evaluation should be related to the organization’s strategy and communication. The evaluation should also provide feedback on strategic development. Once implemented in this way, organizations will continuously learn, grow, adapt, and change meaningfully and effectively (Preskill, 2012, 1–24).

Terziev et al. noted the contributions of social enterprises that enable market-based ventures to achieve social goals. Creativity and entrepreneurship focus on the community rather than individual interests. Social enterprises are in the best position to work with local communities to solve local issues. This approach is flexible and supports long-term social inclusion (Terziev and Arabska, 2017, 41–46).

These arguments deepen the significance of social innovation in modern societies. The commonly used innovation is a new combination of elements, including new products, production methods, markets, resources, organizations, technologies, and other matters, as indicated by Schumpeter. However, social innovation overlaps with the meaning of innovation. Rather than individual projects, it will bring about a transformation of society as a whole, the creation of a better

community, or a change to a socially desirable situation, which will have a large impact on society (a latent variable that is a primary factor with ㊦ as a secondary factor: Social Value [sv]: It is necessary to create social value through university functions). Social innovation is also the act of the regional higher education institution assisting the community with research and education, which is its basic function regardless of culture and reason or that the company has a useful influence on society through its own business, leading to the creation of innovation (Observed variable: Response to questionnaire: Figure 4, responses 27, 28, 29, and 30).

4.2.4 University-community collaboration: Regional collaboration

Cherry et al. argued that community-based organizations (CBO), such as the community outreach partnership center (COPC), are necessary for both parties in traditional positions to work together in collaboration with the university and the community, and we need to work towards full-scale collaboration (Cherry et al., 2004, 219–233)

From a case in the UK, Harta et al. stated that collaboration between universities and communities demonstrated the usefulness of a practical approach (COP: a community of practice) and a transversal approach in which different organizations could cooperate (Harta, 2013, 1–14).

Pacho promoted service-learning, a theory based on John Dewey's (1859–1952) work, based on the idea that “the continuity of experience,” in which all experiences affect future experiences and that experiences are determined by the interaction of internal and external factors. This then creates social contribution activities in the community based on the knowledge obtained by students at school. The practice of service-learning will realize solidarity between the learner and the community and bring benefits to both. Dewey believed that there should be many points of contact between the school's social interests and the community to achieve a collective connection that cannot be achieved alone. This can be an example of university-community collaboration (Pacho, 2015, 8–16).

From these arguments, the cooperation on student education that was most often related to the cooperation between the university and the community (a latent variable that is a primary factor with ㊦ as a secondary factor: Educational Function [ef]: It is necessary to be able to realize industry-academia-government collaboration by education). This treats the problem and solution of the community as a learning subject of the student, and with the main aim of student education while contributing to the community. Students can contribute to solving problems that occur in their local communities while practicing and utilizing the expertise acquired at the university, which is an advantage for both. An insufficient argument is the contribution of university teachers to the community. In particular, there is no previous research that has demonstrated how the links with the community will be based on academic knowledge (Observed variable: Response to questionnaire: Figure 4, responses 31, 32, 33, and 34).

4.3 Creating social innovation success

4.3.1 Knowledge creation

Nonaka developed a paradigm for the knowledge creation process, a source of innovation creation, as a theoretical framework. It is assumed that knowledge is generated from the organization through the continuous dialogue of tacit knowledge and explicit knowledge. Although new knowledge is developed individually, it plays an important role in expressing and amplifying organizational behavior. The view to generate knowledge through “socialization,” “externalization,” “combination,” and “internalization” is known as the SECI model (Nonaka, 1994, 14–37).

Finlay et al. demonstrated the advantages of using the SECI model using four cases. The basic theory of the SECI framework can be generalized to an increasingly complex organizational environment. In addition to the process of knowledge creation and transfer that has been clarified up to this point, it also indicates a potential knowledge transfer gap. The organization’s ability can be built by further developing the traditional knowledge transfer role function to fill the knowledge transfer gap. Of particular interest is the mention of more complex knowledge transfers between multiple organizations (Finley and Sathe, 2013, 59–68).

Nonaka et al. argued that a context for knowledge creation is also required. The generation of Ba is the key and is the basis on which Ba provides the energy to perform individual knowledge transformations. There are four types of Ba: 1. Originating Ba, 2. Dialoguing Ba, 3. Systemizing Ba, and 4. Exercising Ba (Nonaka et al., 2000, 5–34). An important concept in understanding Ba is “interaction,” in which interacting people share context, and the interaction and context create knowledge through self-transcendence. In knowledge creation, participants need to share time and space, especially in “socialization” and “externalization,” and close physical interactions create shared contexts between participants from a common language. As knowledge is intangible and not dynamic in itself, it can act as a platform for knowledge creation by aggregating knowledge on that area in a specific time and space.

Using the four types of Ba, Finley explained how practitioners and scholars create, refine, review, translate, disseminate, and implement knowledge. He demonstrated the existence of a cluster of roles in the middle of the continuum (Continuum), which forms a bridging role between practitioners and scholars (Finley, 2012, 59–68). At one end of this continuum is a group of roles performed by practitioners, and on the other side is a group of roles performed by a scholar. Finley demonstrated seven different roles as knowledge translators: “1. Pure Practitioner: A practitioner who performs their job based on informal reflection and deliberation; 2. Reflective Practitioner: A practitioner who explicitly thinks about why they are doing their job and how to perform it by taking

a deliberate ‘plan-do-review-adjust’ approach to his/her work; 3. Practitioner Researcher: A practitioner who deliberately uses formal, systematic research approaches to improve organizational performance and/or client outcomes; 4. Pracademic: An experienced practitioner who also holds an academic appointment and has established legitimacy and credibility in both academic and practitioner worlds by virtue of their reputation as a subject matter expert, publication record, and ability to achieve sustained business results; 5. Researcher Practitioner: An academic who can conduct academic research as part of their job in a practice setting; 6. Community-based researcher: An academic who uses research approaches designed to engage with community stakeholders to ensure the relevance of the proposed research and to create opportunities for knowledge translation and capacity building; 7. Pure Academic: An Academic who conducts research that has no community connection and undertakes teaching and service within the confines of the institution.” (Finley and Sathe, 2013, 59–68).

4.3.2 External network and regional innovation systems

Cooke argued that regional innovation is based on the ideal of economic regulation. He attempted to typify the technology transfer (regional innovation system) in this area, and divided it into three models: “the grassroots approach,” “the network approach,” and “the dirigiste approach.” The grassroots approach is put into action by universities, municipalities, and companies at the local level. It is assumed that the Japanese Kohsetsushi system uses this approach. The network approach is configured as part of the grassroots approach, and more governmental policy formulation will raise funds. The dirigiste approach is the opposite of the grassroots approach and assumes that the government is the origin as an innovation system (Cooke, 1992, 365–382).

The three models represent the relationship between human resource mobility and the flow of knowledge in the region. Cooke addressed the role of highly skilled workers in regional development, characteristics of knowledge spillover through labor migration, which are key factors for attracting and retaining talent, and the emergence of policies for acquiring knowledge (Cooke, 1992, 365–382). This is a continuation of Florida’s argument (Florida, 2002, 743–755) that proposed a transition from policies and programs to attract and retain talent, from a traditional approach focused on attracting businesses and forming industrial clusters (Triple and Maier, 2007, 1–29). Byosiere demonstrated the importance of knowledge sharing in promoting innovation and discusses the nature of the exchanged knowledge and the strength of the relationship between parties in the knowledge diffusion process. As a result, the strength of the relationship between individuals determines the specificity of the transmission of knowledge and information, and the causality is caused not by the content of knowledge and information but by the strength of social networks (Byosiere et al., 2010, 401–420).

For example, Purdue University designs and develops the tools and frameworks necessary to accelerate cluster development toward creating regional innovation and promoting network and ecosystem innovation. However, in open networks, citizenship plays a central role, and without the premise of open and loosely coupled networks, it is impossible to advance its innovation. Purdue University aims to fill the following five roles in the region: “1. A vibrant ecosystem needs brainpower to power it. 2. It needs support networks for innovation and entrepreneurship to convert brainpower into wealth. 3. The ecosystem also needs networks to develop quality and connected places because both talent and growing companies are mobile; they will only locate in quality connected places where people can comfortably connect. 4. A vibrant ecosystem relies on new, intentionally developed narratives to guide participants to new opportunities and attract new resources to the ecosystem. 5. Finally, an ecosystem cannot develop without a deep pool of people with sophisticated collaboration skills to guide and develop these new networks.” (Purdue University, 2014, 1–10).

These arguments on knowledge creation and regional innovation systems are extremely continuous and closely linked, and it is necessary to discuss them consistently. These suggestions that knowledge creation processes, such as the interaction between tacit and explicit knowledge, can function in a way that interprets communities as Ba. There are various individual management entities such as companies, universities, governments, and NGOs. According to the theory described above, there are dynamics of the SECI model in each organization, and knowledge is created and used in each strategy. By linking and collaborating in the market, the dynamics of the SECI model in each organization are changed, new knowledge is created, and innovation creation is realized. For autonomous development as a region, this can be interpreted as being connected.

The area related to the creation of innovation in the community discussed so far is placed (a latent variable: Innovation Performance [ip]: what is necessary for the community) as a subscale of ©. As latent variables, only this (ip) single measure is the subscale of C. Therefore, only substance C will be present as a primary factor. The observation variables were based on five types of Schumpeter, which are universally positioned (Observed variable: Response to questionnaire: Figure 4, responses 35, 36, 37, 38, and 39).

5. Conclusion: Hypothesis Model

For the model, Figure 3 illustrates the summary of the variables for the survey framework, Figure 4 illustrates the questionnaire to derive observation variables that set based on the above discussion, and Figure 5 is a hypothetical model as the conclusion:

Latent Variables and Supporting Literature				
[Independent Variables]				
Latent Variables 2 (Secondary factor)	Category	Latent Variables 1 (Primary factor)	Supporting Literature	
	Bottom of Pyramid (BOP)	Market Access (ma)	Prahalad (2006)	
			Ravn et al., (2009)	
			Jakki et al., (2012)	
			Shyam et al., (2013)	
Community Business Success	Development/Relationship	Network (ne)	Rahman et al., (2014)	
			Cansaque and Hart (2015)	
			Pramongkita et al., (2002)	
			Hewison (2006)	
			Chen (2014)	
	Creating Shared Value	Autonomy (au)	Ruangkrit and Thechatakern (2015)	
			Santipolvut and Sripruetkiat (2012)	
			Morrison (2012)	
			Social Value & Economic Value (se)	Tamminen (2014)
				Dover et al., (2013)
			Porter and Kramer (2011)	
			Moon et al., (2011)	
			Pimpa, et al., (2014)	
			Ishak (2018)	
[Dependent Variables]				
Latent Variables 2 (Secondary factor)	Category	Latent Variables 1 (Primary factor)	Supporting Literature	
University Contribution Success	Open Innovation	Cooperation (co)	Chesbrough (2003)	
			Chesbrough and Appleyard (2007)	
			Chesbrough and Prencipe (2008)	
			Chesbrough (2010a)	
	University-Industry Collaboration	Knowledge Transfer (kt)	Gassmann et al., (2010)	
			Chesbrough and Bogers (2014)	
	Social Innovation	Social Value (sv)	Janschek et al., (1998)	
			Uttarakumard and Schiller (2009)	
	University-Community Collaboration	Educational Function (ef)	Fuentes and Dutrenik (2010)	
			Malik and Wickramasinghe (2015)	
			Gershuny (1982)	
			Hazelkorn (2009)	
			Preskill and Beer (2012)	
			Terziev and Arabaska (2017)	
			Cherry and Shefner (2004)	
			Harta et al., (2013)	
			Pacho (2015)	
[Dependent Variables]				
Latent Variables 1 (Primary factor)	Category	Latent Variables 2 (Secondary factor)	Supporting Literature	
Creating Regional Social Innovation Success	External Network	Innovation Performance (ip)	Nonaka (1994)	
			Nonaka et al., (2000)	
			Finley and Sathe (2013)	
			Cooke (1992)	
			Tripple and Malier (2007)	
			Byssiere et al., (2010)	
			Purdue University (2014)	

Figure 3. Survey framework

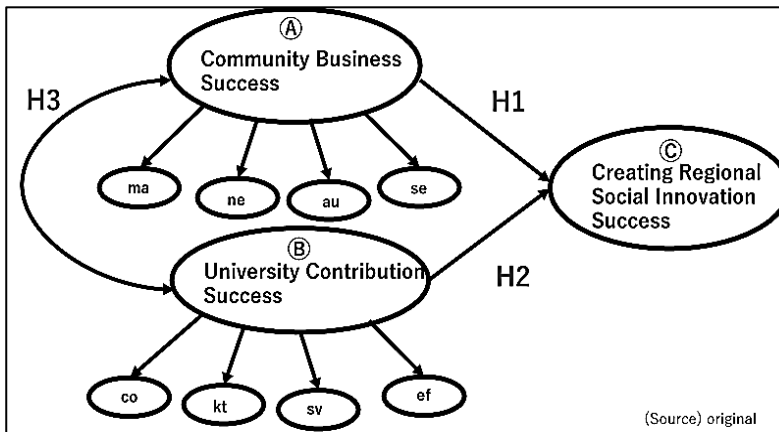


Figure 5. Hypothesis Model

H1 $A \rightarrow C$ implies that A had a positive effect on C ;
 H2 $B \rightarrow C$ implies that B had a positive effect on C ; and
 H3 $A \leftrightarrow B$ implies that A and B had a positive effect on each other.

The following factors are necessary to realize A :

- Enter the market (ma);
- Build regional networks (ne);
- Develop businesses with autonomy; and have (au)
- Desire to balance economic and social values (se).

Market Access (ma)	
1	Community people need to have purchasing power.
2	Companies need to be able to sell to low-income groups.
3	Community people need to be brand-oriented.
4	Community people need to have a network as a consumer.
5	Community people need to be able to easily accept advanced technologies such as new products.
Network (ne)	
6	The community needs the existence of "trust".
7	The community needs to be not a strict hierarchy of hierarchical relationships.
8	It needs to be an open economic community.
9	Companies need to share "values" with their business partners.
Autonomy (au)	
10	Regional development need to start their own regional business, not by external entrants.
11	Regional development need an original business model tailored to the region, not porting in developed countries.
12	Companies need to use government subsidies at only first stage and then independence at the end stage.
13	Community people also need to get out of low income independently without relying on government subsidies.
Social Value & Economic Value (se)	
14	Successful companies are necessary because they lead to affluence in society.
15	Social development needs to be realized not only by governments and NGOs, but also by business development.
16	Promotion of community business is necessary because it can easily lead to the contribution of the area.
17	For social contribution, it is necessary to consider not only large companies that can afford, but also small businesses.
18	Thai culture has a tendency to cherish charity and charity, so it is good for the development of the region.
Cooperation (co)	
19	Universities need to create value not only through their own technologies and services, but also through collaboration with companies and other universities.
20	Universities need to work on a daily basis to maintain a deep connection with companies.
21	Universities need to make daily efforts to maintain a deep connection with the local population.
22	Universities need to take leadership in the community to achieve collaboration.
Knowledge Transfer (kt)	
23	Universities need to aim at creating innovation through co-creation with companies (as well as technology transfer to companies and technology development by role assignment).
24	Universities and companies need to be aware of technology collaboration with a focus on commercialization.
25	It is necessary for the university to develop technological frontiers.
26	In the future, it is necessary for universities to establish deep cooperation with micro enterprises.
Social Value (sv)	
27	Universities need to contribute to the development of local communities from the viewpoints of "education" and "research".
28	Support for business success by the university is necessary.
29	Industry-academia collaboration in social sciences (marketing and accounting) is necessary.
30	Cooperation between the university and the administration is also necessary to create social value.
Educational Function (ef)	
31	It is necessary for university students to enter the community and carry out the actual problem solving in order to lead to educational effects.
32	It is necessary for university students to enter the community and conduct actual problem solving in order to contribute to society.
33	It is necessary to return the academic expertise of the university teachers (social sciences area) to the community and contribute to regional development.
34	The educational activities of university teachers for corporate employees are beneficial and necessary.
Innovation Performance (ip)	
35	"Development of new technologies and products that create new consumers" is necessary.
36	"Introduction of new production efficiency, production speed, production method, etc." is necessary.
37	"Development of new markets such as online sales" is necessary.
38	"Development of new purchasing destinations for resources, raw materials and products" is necessary.
39	"create an organization with new system construction" is necessary.

Figure 4. Questionnaire to observation variables

The following factors are necessary to realize ㊦:

- Collaborate with companies to produce something (co);
- Realize that collaboration through knowledge transfer (kt);
- Create social value through the function of the university (sv); and
- Realize industry-academia-government collaboration through education (ef)

This study uses an industry-academia-government collaboration model to develop a hypothetical framework for the creation of social innovation. Given that many rural regions face the challenges of low birthrates and an aging society, the prospect of endogenous economic development is high. A framework for collaboration based on industry-academia-government innovation can lead to social innovation that will translate into economic development.

However, there are some limitations to this study. While I have presented a hypothetical model, the hypothetical model does not mention the function of government. It is necessary to quantitatively summarize the answers to the questions illustrated in Figure 4 and present them in future research. In future research, the hypothetical model will be analyzed using a covariance structure analysis, which will examine the relationship between the multiple structural concepts after a quantitative survey has been conducted.

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