



A Study on the Significance and Revitalization of Local Currency

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Abstract

Purpose: This study aims to explore the significance and potential strategies for revitalizing local currency systems. Designed for use within specific regions or communities, local currencies play a crucial role in supporting and revitalizing local economies. By promoting local consumption and supporting local businesses, local currencies contribute to economic growth and job creation at the community level. **Research design, data and methodology:** The research methodology involves a comprehensive review of existing literature and various case studies to analyze the effectiveness and sustainability of local currencies. The literature review investigates the theoretical background and diverse implementation cases of local currencies, while the case studies identify the success factors and challenges faced by actual local currency initiatives. **Results:** This paper confirms that local currencies contribute to economic growth and job creation at the community level by promoting local consumption and supporting local businesses. Additionally, this study investigates the economic, social, and environmental impacts of local currencies. **Conclusion:** In conclusion, this study analyzes the challenges faced by local currency systems and proposes strategies to enhance their effectiveness and sustainability. These strategies are expected to provide practical assistance in the development and implementation of local currencies, contributing to the revitalization of local economies and the sustainable development of local communities.

Keywords : Local Currency, Community Economy, Economic Development, Sustainability, Revitalization Strategies

JEL Classification Code : O16, R11, R58

1. Introduction

1.1. Research Background and Purpose

Local currency (regional love gift certificates) is being actively promoted for the purpose of reducing consumption and revitalizing stagnant local commercial areas due to the recent deterioration of the domestic economy, preventing the outflow of local funds offshore, encouraging local residents' affection, overcoming difficulties, and boosting local economic vitality by promoting consumption and distribution of broken products.

The purpose of this study is to present institutional implementation measures linked to the analysis effect so that

the results obtained through this study can be used to enhance the original purpose of supporting small business owners in the region and revitalizing the local economy. This study summarizes previous studies and concepts related to local currency, and summarizes discussions related to local currency through case analysis. In particular, it is intended to analyze the ripple effect of the local economy of the local currency model and present strategic measures for activation.

1.2. Research Method and Analysis Frame

For the purpose of the above study, this study selected overseas local currency that domestic and foreign researchers paid attention to as a successful local currency.

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Domestic local currency was selected and studied as the best case domestic community currency in 2021 among local love gift certificates. A case study was conducted as a research method. Case studies are a type of qualitative research. Case studies provide detailed information on a single or multiple cases using data sources such as literature, interviews, observations, etc., focusing on technology and analysis (Creswell, 2015). Literature data such as papers, research reports, and books were reviewed, and internal data of each region and data requested for information disclosure were collected from the Ministry of Public Administration and Security on necessary matters. The research analysis framework of this study is shown in Figure 1.

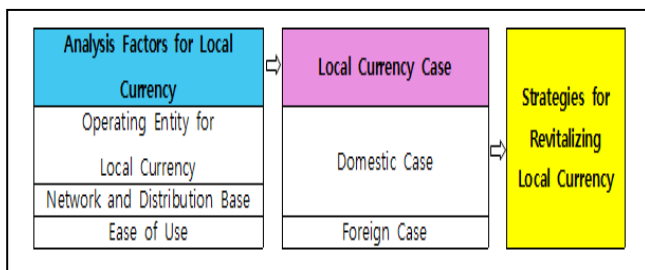


Figure 1: Research Analysis Framework

2. Theoretical Background

2.1. Concept and Type of Local Currency

Local currency has developed in a variety of ways, from individuals to private organizations, public institutions, and the government, to solve problems in the community. It has been issued to solve local economic problems and provide services to the economically vulnerable, to prevent polarization and devastation of the local economy due to globalization and market competition, and some have been initiated to respond to environmental problems such as climate crisis and peak oil problems (Cho, 2020).

In addition, the use of local currency reduces the ecological footprint because the distribution process proceeds within the region without going through an external distributor. Through this role, local currency has a positive effect on regional economic development and resilience building (Choi, 2024).

Local currency increases regional resilience and builds a regional circulating economy, and if such a system is established in the region, the financial power of public institutions and the wealth created by local residents are not leaked out of the region. By allowing funds accumulated in the region to be invested again in the region and accumulated as the "wealth of the local community," it is possible to create better jobs, social welfare services, and

sustainable development in the region (Yang et al., 2022).

Local currency refers to a payment method other than the legal currency used within a specific region or group. The core characteristics of local currency are different from those of legal currency in terms of issuance purpose, distribution scope, coercion, function and valuation, and they have different characteristics among local currencies. The purpose of issuing local currency is to prevent the outflow of funds from the outside of the region, to support the revitalization of small business owners and alley areas in the region, and to contribute to the development of the local economy. The distribution range of local currency can only be distributed in a specific region, and it is not possible or restricted outside the region.

Currently listed local currencies have various purposes and forms, making it difficult to distinguish clearly, but they can be classified into community currency and convertible currency depending on whether they can be exchanged with legal currency.

Table 1: Types of Local Currency

Classification		Key Features	Key Features
Community Currency	LETS	debit account transactions	Let's (Canada), Hanbatlet's (Daejeon)
	Hours	Issuance of real money	Ithaca Hour (United States)
	Time Bank	Input term transaction	Time Dollar (US), Time Credit (US), Bristol pound (UK)
Convertible Currency		to exchange into legal currency	Berkshire (United States)

Note: Kristofer Dittmer, 2013.

2.2. Significance and Importance of Local Currency

Local currency is characterized by limiting the targets of economic stimulus policies or policy objectives to the local economy and small business owners. Therefore, the primary policy effect of local currency can be seen as the effect of converting consumption in the region and the effect of transferring sales to small business owners, but if only the transfer effect of existing consumption occurs and new consumption is not created, the ultimate purpose of stimulating the economy will not be achieved. In other words, one of the important policy effects is how much consumption that is not replaced with existing consumption

has increased due to the introduction of local currency. In the study on the economic effect of local currency, first of all, there are studies that estimate the increase in sales of small business owners and the industrial inducement effect by considering the issuance amount itself as an economic effect. (Lee, 2017; Kim, 2017; Yang, 2019; Lee & Park, 2018). These kinds of studies are likely to have overestimated the economic effect because the crowding out effect of consumption using local currency is not reflected in the analysis. For example, the analysis of Lee and Park (2018) does not calculate the economic effect when the amount of local currency issued by the youth dividend and maternal health support project is supported by general currency. In order to estimate the net economic effect of the introduction of local currency, it is reasonable to analyze by deducting the economic effects when the project is supported by local currency and when it is supported by general currency (Kang et al., 2020). In addition, these studies do not deal with the effect of converting consumption within the region and the effect of converting sales of small business owners, which are important policy goals of local currency. Recently, some studies have been found to estimate a more rigorous causal relationship by reflecting the effect of local currency replacing the amount consumed by existing payment methods such as cash and credit cards (Song & Lee, 2020; Kang, 2020).

3. Case Studies

3.1. Foreign Case Studies

3.1.1. LETS: Local Exchange Trading Systems

In 1983, Michael Linton was introduced to help the unemployed through trade in goods and services without legal currency at a time when the liquidity of the legal currency in the region (Comox Valley, Canada) was greatly insufficient due to the economic downturn. Individual members provided designated goods and services to other members, converted their values into local currency, and recorded them in member accounts within the steering committee, and the value of the goods and services traded was determined by mutual agreement. Members who received goods or services will have '-', and those who provided them will have '+' points, and when both parties notify the system administrator of the transaction details, the system administrator will use a payment method in the form of recording in each member's account. Because of the two-way transaction, trust between members was required because the total number of accounts in the system was always '0', and there was no interest charge on '-' points and there was no deadline for repayment obligations. System

administrators regularly disclosed the contents of goods and services that members are willing to provide or are looking for through bulletin boards or websites. Each member searched for information, contacted the other party directly when the desired goods and services were disclosed, negotiated, and executed the transaction. According to a recent survey, there are about 400 Letts in operation across the UK, and in the past, Letts in the UK was mainly made by individual volunteers, but in recent years, local governments are increasingly creating Letts as a means of poverty countermeasures or community development.

3.1.2. Hours - Ithaca Hour

In 1991, Paul Glover issued Ithaca Hour, a real-life local currency, to mitigate the offshore outflow of funds in Ithaca City in the United States. Paul Glover is believed to be the root cause of the largest number of poorest people in Ithaca City in the United States, due to the outflow of funds from the region. Cornell University is a small city with a population of about 30,000 in New York State. Through the Let's operation experience, Paul Glover felt the need for a simple system with a low burden on management and operation, and devised a local currency that was used in real form without computer records.

However, despite the success of the 1990s, it has declined since the late 2000s as founder Paul Glover moved to other regions and the overall payment method changed from the existing cash center to credit and cash cards. To overcome the decline, Tompkins County (which belongs to the city of Ithacash) issued banknotes and digital Ithaca Dollars (i\$, 1i\$ = \$1) through its reverse currency project, Ithacash, in 2015. Unlike the time dollar, which does not make a difference in the value of labor, in the case of high-end service providers such as doctors and lawyers, the value of one hour of labor was calculated through negotiations at a level higher than that of one Ithaca hour. Silver coins were added to the bill as a means of anti-counterfeiting devices, and six types were issued, including '2 hours, 1 hour, 1/2 hour, 1/4 hour, 1/8 hour, 1/10 hour', and exchange into legal currency was not possible. The Ithaca Reserve Board held a meeting every two weeks to determine the issuance volume and timing of Ithaca Hour and the loan project. The committee was composed of nine council members selected from local residents. In the case of community contribution projects, interest-free loans were possible. Residents posted goods or services they wanted to exchange or receive in a regular bulletin "HOUR TOWN".

3.1.3. Time Bank - Time Dollar

In 1986, Edgar Cahn devised the Time Dollar in Washington, D.C., with the aim of creating new community value through service exchange among members. Mutual assistance activities were encouraged by giving value to

volunteer activities and converting the value into time so that it could be used if necessary. The value generated by individual volunteer activities was converted into currency and recorded in the member account of the Steering Committee. Time dollar was considered equal for everyone's time value and calculated as 1 hour for working per unit hour. Members who provided one hour of service to other members recorded '+1' time dollar, and members who received the service recorded '-1' time dollar in the account. The '+' time dollar can be used when receiving the service by oneself and can be donated to other members or organizations. The Time Dollar Steering Committee limited transactions subject to time dollars to mutual assistance, called 'The gift economy', except for commercial economic exchanges. The US Internal Revenue Service recognizes time dollar transactions as a social welfare program and is not taxed, which contributed to the spread of time dollar in the community. Since many participants are participating in the system for pure volunteer purposes, the actual usage rate of time dollar was only 15%.

3.1.4. Bristol Pound (£ B): Convertible Currency

In September 2012, the city of Bristol, UK, led by civil society, promoted for the first time to revitalize retail stores and markets in the region and maintain local employment by mitigating the outflow of funds offshore, and the urban population is 430,000 people and about 1 million people live including the population of surrounding cities. It is the first local currency issued by the city across the UK, the largest well-organized local currency in the UK and Europe, and is evaluated as the most successful case. It is issued in four types of real currencies (1, 5, 10, and 20BP), and the value of the currency is equivalent to that of the legal currency. You can exchange British pounds for Bristol pounds of the same amount by opening an online bank account (BP account) or visiting an Access point. It can be used as cash at affiliated stores, regardless of membership status, and can be used in combination with legal currency. In addition to payment using real money, online and mobile payment is possible through the opening of a Bristol Credit Union (BCU) account. Individual members can use electronic payment by exchanging legal currency (GBP) into Bristol pounds (BP) and using real money or transferring a certain amount to BP account. In the case of other payment methods such as credit, debit cards, and PayPal, a 3% fee is incurred, and local food farmers and businesses are exempted from currency exchange fees.

The Bristol pound secretariat is operated by the Community Interest Company (CIC), a form similar to Korea's social enterprises, and is autonomously operated by a combination of various private resources rather than the city government issuing and operating currency directly. The city of Bristol pays part of its employee salary in Bristol,

and in the case of the mayor, the full salary is paid in Listol.

3.2. Domestic Case Studies

3.2.1. Incheon Metropolitan City, Incheon e-eum

Incheon City's flagship product, the "Incheon e-eum" card, is revitalizing the economy by reviving the local economy. Since it started as an INCHEON card in April 2018 and changed to Incheon e-eum in 2019, it has stood as a leader in local currency nationwide with 10% cashback and has been evolving every year with various additional services. Incheon e-eum has long established itself as a necessity for Incheon citizens, with cumulative 2.29 million subscribers and accumulated transactions exceeding 10 trillion won. In addition, in a survey of citizens last year, 94% of citizens recognized the effect of revitalizing the local economy of Incheon e-eum, establishing itself as a "citizen's platform." Incheon accounts for 52.8 percent of citizens' offshore consumption outside Incheon, the highest in the country after Sejong (65.9 percent) in 2014. This is largely due to the geographical requirement that Incheon is a metropolitan area surrounded by Seoul and Gyeonggi Province. Accordingly, the city has released an electronic local currency that can solve the problem of previous paper gift certificates while solving the chronic offshore consumption rate problem. Together with KonaI Co., Ltd., the city promoted Incheon e-eum, centered on IC chip-based prepaid cards. Through this, the high issuance cost, inconvenience of carrying, and illegal exchange of money, so-called 'gang', which were inherently held by paper gift certificates, were solved.

In addition, for the first time in the country, a cashback method was introduced in which points were paid at each payment, rather than a pre-discount method that discounts the face value of gift certificates. Through this, Incheon e-eum served as a priming water for citizens' consumption, in which consumption produces another consumption as well as the fun of consumption. Based on its convenience and versatility, Incheon e-eum had 2,298,543 cumulative subscribers, 8,726.21 billion won in charging, and 10.22723 trillion won in payments as of March 31. This is close to half of the nation's electronic money issuance. Incheon e-eum also reduced Incheon's offshore consumption by 35.9 billion won, according to a study by the Incheon Institute. In particular, policy effects are also emerging, with economic benefits reaching 356.6 billion won in a study by the Korea Institute for Local Administration in 2020, and a study by the Korea Society of System Dynamics last year predicting that sales of small and medium-sized businesses will increase by up to 47.2%.

3.2.2. Daejeon Metropolitan City, Ontong Daejeon

'Ontong Daejeon', the local currency, is emerging as a

significant economic asset aimed at improving people's livelihoods. It is seen as instrumental in revitalizing the local economy, particularly during the COVID-19 pandemic, by preventing the outflow of capital, supporting small businesses, and self-employed individuals. The currency has generated various economic benefits, including stimulating production, adding value, and creating employment opportunities.

In its second year of issuance, the city of Daejeon has decided to enhance the policy surrounding 'Ontong Daejeon' to further strengthen the local economic ecosystem. The focus is on expanding citizen-oriented policy functions to address operational deficiencies, resolving consumption imbalances, and diversifying online content and functionalities. The plan includes leveraging the infrastructure of 'Ontong Daejeon' to discover more site-specific policies, enhancing platform convenience, and offering additional services.

However, there have been criticisms regarding the perceived wastefulness of taxpayer money and debates surrounding the integration of 'Ontong Daejeon' with the Daedeok e-commerce system. Issues such as dual operation methods, equity concerns, and opinions on currency integration have surfaced.

Currently, challenges such as low participation rates among Daejeon Mall subscribers, inadequate civic engagement content, and limited customer convenience features of 'Ontong Daejeon' are being addressed. The city plans to improve these aspects by expanding all Daejeon Mall content and access channels, establishing a dedicated regional shopping mall, and supporting the development of a permanent online live broadcasting sales network and delivery platform for merchants.

4. Strategic Measures to Revitalize Local Currency

Most local government officials believe that the reason for the delay in revitalizing local currency is the lack of securing franchisees and the lack of measures to expand users. To solve this problem, many local governments across the country are trying to secure users and merchants by expanding from ① general issuance to policy issuance and introducing cards and mobile payment systems in ② tributaries (paper gift certificates), but the current situation does not seem to be as tangible and practical as expectations and efforts.

4.1. Step-By-Step Activation Strategy

In the initial stage, it is crucial to establish a precise

concept for the issuance of local currency and present a clear roadmap. Following this, devising a plan to revitalize local currency through collaboration with provincial, municipal, and county authorities is essential. Additionally, understanding how to enhance awareness of the provincial policy proposals and support system is necessary. Finally, in the last stage, local governments, together with relevant stakeholders, should develop measures to invigorate local currency by establishing a platform to offer additional benefits tailored to the characteristics of each city and county.

4.1.1. Preparation Stage

Survey and analysis: conducting a preliminary survey to understand the characteristics of the local economy and the needs of residents. Stakeholder Consultation: Sharing the need and goals of local currency through consultation with key stakeholders such as local governments, local merchants, and community organizations.

4.1.2. Introduction Phase

Implementation of a pilot project: Identify the effects and problems of local currency through a pilot project within a limited range. Publicity and education: Strengthening resident education and public relations activities on the purpose and how to use local currency (North, 2007).

4.1.3. Diffusion phase

Expanding scope: Gradually expanding the scope of use of local currency based on the success of the pilot project (Graugaard, 2012). Providing incentives: Providing incentives such as discounts and bonus payments to promote the use of local currency (Williams, 2006).

4.1.4. Stabilization steps

Monitoring and Evaluating: Continuously monitor the usage of local currency, and seek improvements through periodic evaluations (Seyfang and Longhurst, 2013). Securing Sustainability: Inducing voluntary participation and cooperation in the community for the sustainability of local currency.

Table 2: Step-By-Step Activation Strategy

Step	Activation Strategy
Preparation Stage	Investigation and Analysis Stakeholder consultation
Introduction Phase	Implementation of a pilot project Public relations and education
Diffusion phase	Expansion of scope Providing incentives

Stabilization steps	Monitoring and Evaluation Securing sustainability
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4. 2. Operational Activation Strategy

Efforts should be made at the local government level to revitalize local communities, strengthen networks within the region, form and strengthen trust and norms, foster a sense of community and pursue values, form consideration and consensus for the socially underprivileged, and promote high resident consciousness and affection. It is most desirable to present a virtuous cycle structure in which the increase in local transactions due to the introduction of local currency expands the organic network and trust of local residents, creates local jobs along with the increase in production within the region, which in turn feeds back to local consumption. In other words, the introduction of local currency can be used as an opportunity to make local residents aware that it can bring about the revitalization of local communities and communities. It is essential to raise awareness of local currency. In order to expand the use of local currency by local residents, it is necessary to raise awareness of gift certificates. It is necessary to increase the use of gift certificates by recognizing the contribution of the introduction of gift certificates to the growth of the local economy. It is necessary to strengthen the promotion of gift certificates than it is now, and public relations activities through broadcasting and media before and after publication, distribution of promotional flyers, signing agreements to promote the purchase of gift certificates with major institutions in the region, and holding events through holiday periods such as Lunar New Year and Chuseok.

5. Conclusion

Local currency is an important tool to revitalize the local economy and strengthen the solidarity of local communities. Successful revitalization of local currency requires thorough preliminary preparation and step-by-step strategies. In the preparation stage, the local economy and the needs of its residents should be closely analyzed, and the goals and needs of local currency should be clarified through consultations with key stakeholders (Kim, 2019). In the introduction stage, practical applicability should be evaluated through pilot projects, and the usage and benefits of local currency should be actively promoted to local residents (Colom, 2005). In the diffusion stage, the scope of use should be expanded based on the results of successful pilot projects, and various incentives should be provided to encourage use (Graugaard, 2012). Finally, in the stabilization stage, problems should be identified and improved through continuous monitoring and evaluation,

and the sustainability of local currency should be secured by inducing continuous participation of local communities (Seyfang & Longhurst, 2013).

Beyond simple economic tools, local currency plays an important role in strengthening community ties and building a sustainable local economy. This requires thorough planning and implementation at each stage, and active participation and cooperation of local residents are essential. Through continuous education, public relations, and policy support, local currency should be able to take root in local communities (Williams, 2006; Park, 2021).

The key to local currency lies in minimizing the outflow of capital from the region as much as possible and leading to increased sales within the region. Essentially, the primary aim is to prevent the outflow of local capital by encouraging production and consumption within the region. Particularly, as concerns for the socially disadvantaged and universal welfare have grown amidst the overall challenging domestic economic conditions in recent years, the issuance and usage of local currency are gradually expanding. This is accompanied by a heightened awareness among residents of its necessity and justification. Furthermore, the long-term economic recession has exacerbated issues such as income inequality, shrinking consumer confidence, inflation, rising unemployment, population decline, and increased youth unemployment rates, thus becoming social challenges. In response, governments are seeking alternative solutions under the premise of addressing regional imbalances and promoting regional economic development, with local currency emerging as one such alternative. In this context, this study comprehensively examines the rationale and necessity for issuing local currency, the types of issuances, and their respective advantages and disadvantages through various research literature, field interviews, and researchers' expertise.

The research findings encompass a thorough analysis of several key aspects related to local currency issuance. Firstly, previous studies have convincingly established the importance of issuing local currency, underscoring its value and necessity. Secondly, an in-depth examination of various forms of local currency issuance, such as paper, cards, mobile, and blockchain, was conducted, highlighting their respective strengths and weaknesses. It was particularly recommended that registered check cards are best suited for paying policy allowances due to their conflict resolution capabilities, budget efficiency, and performance certainty. Thirdly, the study emphasizes the need for detailed analysis regarding the provincial issuance of gift certificates at the city and county level, with decisions informed by the research findings. Additionally, objective data from diverse sources were utilized to present insights into the scale and cost considerations of local currency issuance. Finally, the study proposes a range of strategic measures aimed at

promoting local currency, fostering economic ripple effects, and offering recommendations for effective implementation.

According to the research, urban areas with relatively large populations and well-established industrial structures experience significant local economic ripple effects. However, rural areas with small populations may have different impacts on the local economy. Understanding the distribution impact of local currency, especially its ripple effect before issuance, and confirming affiliated stores pose challenges. Economic effects can be enhanced by increasing the value of regional circulation through small business owners and encouraging additional cash expenditures by tourists.

This study provides essential data for establishing a systematic and comprehensive plan to promote and distribute local currency, aiming to prevent the outflow of local capital, support local businesses, and enhance regional competitiveness. Despite analysis limitations, the study offers meaningful insights and recommendations for advancing local currency projects.

References

- Bank of Korea Economic Research Institute. (2020). Operation status and issues of local currencies by local governments.
- Cho, B. H. (2020). Local community economy and local currency: A local currency system for activating social economy. *Korean Journal of Economic Development*, 26(3), 33-66.
- Choi, J. H. (2024). *Research on local circular economy and local currency* (Doctoral dissertation, Wonkwang University).
- Collom, E. (2005). Community currency in the United States: The social environments in which it emerges and survives. *Environment and Planning A*, 37(9), 1565-1587.
- Creswell, J. W. (2015). *Qualitative inquiry and research design: Choosing among five approaches* (Translated by Jo, H. S., Jung, S. W., Kim, J. S., & Kwon, J. S.). Hakjisa.
- Douthwaite, R. (1999). *The ecology of money*. Schumacher Briefing No. 4, Green Books.
- Graugaard, J. D. (2012). A tool for building community resilience? A case study of the Lewes Pound. *Local Environment*, 17(2), 243-260.
- Kang, C. H., Kang, J. W., & Kim, S. A. (2020). The effects of local currency on local employment. Policy Planning Committee.
- Kim, Y. (2018). Conditions for the successful operation of local currencies. *Journal of Local Finance Research*, 23(1), 123-140.
- Kim, Y. (2019). The economic effects and operational strategies of local currencies. *Journal of Local Administration Research*, 35(2), 45-67.
- Lee, B. G., Jeon, D. W., Ko, K. H., Kim, G. W., & Choi, I. S. (2017). Economic effects analysis and institutionalization plans of hometown love gift vouchers. Korea Local Administration Research Institute.
- Lee, J. H., & Kim, H. G. (2017). Analysis of economic effects of Jeju love gift vouchers issuance. Jeju Research Institute.
- Lee, S. H., & Park, N. R. (2018). Economic effects of Gyeonggi Province's local currency: Focusing on youth allowance and other policy subsidies. Gyeonggi Research Institute.
- North, P. (2007). *Money and liberation: The micropolitics of alternative currency movements*. University of Minnesota Press.
- Park, J. (2021). Policy measures for the activation of local currencies. *Journal of Korean Local Government Studies*, 27(3), 89-112.
- Seyfang, G., & Longhurst, N. (2013). Growing green money? Mapping community currencies for sustainable development. *Ecological Economics*, 86, 65-77.
- Song, K. H., & Lee, H. W. (2020). Analysis of the impact of introducing local currency on local economy. Korea Institute of Public Finance.
- Williams, C. C. (2006). Community currencies as a tool for tackling social exclusion. *Local Economy*, 21(1), 1-16.
- Yang, J. H. (2019). Analysis of economic effects of "SIRU" local currency in Siheung: Increase in local consumption and its macroeconomic ripple effects. Incheon National University.