

Florida States University

**Study on the Operation of Seoul Urban Regeneration Fund**

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**Letter of Transmittal**

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Dear Mr. Ryu

It is my pleasure to submit my research report, 'A Study on the Operation of Seoul Urban Regeneration Fund'. The urban regeneration project, which was introduced as an alternative to the existing urban development project, is characterized by a long project period and frequent plan changes. Therefore, stable and flexible financial support is essential for the smooth promotion of the projects. However, the current budget system does not properly reflect the characteristics of such urban regeneration projects. Accordingly, the city of Seoul established and has been operating the Seoul Urban Regeneration Fund (SURF) for the first time in Korea in 2017.

This study looked into ways that the SURF can support the urban regeneration project more effectively. To this end, this study evaluated the current operation status of the SURF, identified points that need improvement, and suggested effective utilization plans of SURF based on the analysis results. As a result of the evaluation, the need for diversification of financial resources was identified in terms of revenue, and the necessity of active utilization of surplus assets in terms of expenditure was confirmed. First of all, regarding the use of surplus assets, this report analyzed the validity of an investment plan using the Korea-US stock price co-movement that was proposed to the Seoul city in 2015 but was discarded without review. As the result of the analysis did not confirm the consistency of the stock price co-movement phenomenon, it is advisable that the Seoul Metropolitan Government reject the proposal. Meanwhile, in relation to SURF's financial diversification, a Lifetime Management model using governance was presented. This model will enable sustainable and self-reliant urban renewal projects.

I expect Seoul to play a leading role in the urban administration of Korea by reflecting the policy alternatives proposed in this report in the urban regeneration policy.

Sincerely,

Mingu Park

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This study began with pride as the first person in charge of establishing the Urban Regeneration Fund in Korea, but it ended with a heavy sense of responsibility. Because the fact that, after four years of twists and turns, the newly established Urban Regeneration Fund was not being utilized efficiently was a great rebuke to me. Of course, despite my efforts, this study has many limitations, but I hope this study will contribute to the development of urban regeneration administration in Seoul.

This research was completed over a period of two years, and during that time many people and institutions aided and encouraged me in many ways. First of all, this study and the preparation of the report were made possible through the Florida State University MPA course with the support of the Seoul Metropolitan Government Long-Term Fellowship for Overseas Studies. I would like to record my appreciation to the Seoul Metropolitan Government senior director Jangkwon Yeo and Director Hwa-young Jang for reviewing the overall composition and logical flow of this study despite the busy schedule, and the city staff for helping to secure data.

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## Executive Summary

Seoul, the capital of Korea, established the Seoul Urban Regeneration Fund (SURF) in 2017 to overcome the limitations of the current budget system that did not reflect the characteristics of urban regeneration projects. This report evaluates the operation status of SURF, identifies points that need improvement, and presents effective ways to utilize SURF based on the analysis results.

As a result of reviewing the operation status of SURF from 2018 to 2019, the source of revenue for SURF consists only of overconcentration charges, and the surplus assets are passively deposited in bank deposits; thus, it is necessary to diversify financial resources and utilize the surplus assets more actively. In the case of expenditures, SURF showed a higher rate of change than the budget (general account, special account) in both expenditures compared to the previous year and expenditures compared to the plan for the current year; so, SURF was being operated flexibly in both time series analysis and cross-sectional analysis.

Based on the results of the evaluation, this report presents a plan to utilize SURF itself in terms of utilizing SURF's surplus assets and diversifying its resources. Regarding the use of surplus assets, the proposal for the stock investment of SURF's surplus assets by using the phenomenon of Korea-US stock price co-movement was reviewed. As a result of conducting Pearson correlation analysis and multiple regression analysis on representative stock indices (KOSPI 200, S&P 500, DJIA) of Korea and the United States from 2010 to 2019, it was not enough to clearly prove or deny the existence of the Korea-US stock price co-movement by period. These results can greatly harm the stability of SURF as a public fund. This is because it may be possible to make profits when the stock price co-movement is clear, but when it is not, there is no choice but to lose a lot. In addition, since it is impossible to predict the timing of the stock price harmonization in advance, the city of Seoul should not accept the proposal.



Meanwhile, in the aspect of SURF's financial diversification, this report presented a Lifetime Management for Self-reliant Regional Regeneration (LM) model. The LM model has significance in that it not only diversifies financial resources but also connects urban regeneration project models and financial management plans step by step by utilizing governance. In addition, to ensure that the discussion on the LM model is not limited to theoretical ones, the actual Chungjeong-ro 4-gil area in Seoul was selected and hypothetical case analysis was conducted step by step. The LM model is largely divided into three stages: introduction, formation, and maturity. As the stage increases, the role of the private sector increases compared to that of the public sector. The role of SURF goes beyond the introduction stage, which unilaterally supported the project, and at the formation stage, the regeneration account and the independence account are separated, and private finances are incorporated into the revenue source of the independence account. The funds secured in this way are re-invested in the region, which forms a virtuous cycle. At the maturity stage, all funds accumulated in the independence account managed by the local government are transferred to the regional regeneration fund operated by the regional regeneration corporation. In the introduction stage, individual residents who have not yet been organized operate profitable businesses; however, in the formation stage, an organization is formed by a coalition of local residents and companies, and this organization emerges as a partner of the government as the subject of regional regeneration. At the maturity stage, this organization is integrated into a regional regeneration corporation to lead independent and self-sustaining urban regeneration. This LM model can solve problems caused by inconsistency between projects and finances by linking the project model and financial operation by stage. In addition, it can contribute to diversifying the SURF's financial resources by securing those from the private sector through utilizing governance in the urban regeneration process. Urban regeneration led by the private

sector enables the development of customized policies for each region, so it is the most suitable strategy for smart urban regeneration to solve challenges cities face in a future-oriented manner. However, in order to actually apply this model, a revision of the law must be preceded to incorporate the benefits obtained in virtue of urban regeneration projects into SURF's financial resources. In addition, measures to strengthen safety to secure private financial resources should be prepared. The city of Seoul is expected to play a role in leading urban administration in Korea by reflecting the policy alternatives proposed in this report in its urban regeneration policies while making efforts to solve these problems in the future.

## **A Study on the Operation of Seoul Urban Regeneration Fund**

### **I. Introduction**

#### **1. Problem Statement**

Seoul, a city where 18.6% (9,639,541) of the total population of Korea (51,779,203) live, has a faster and more serious decline (KOSIS National Statistics Portal, n.d.). In fact, 76.1% of the total 424 administrative donges in the city of Seoul meet at least two legal requirements - population reduction, industrial decline, and level of deterioration for urban regeneration (Seoul Urban Regeneration Portal, n.d.). Accordingly, the government enacted the 'Special Act on Promotion of and Support for Urban Regeneration (SAUR)' on June 4, 2013, and enforced on Jan. 2, 2013, to revitalize the declining cities economically, socially, physically, and environmentally. Seoul established the Urban Regeneration Headquarters, an agency dedicated to urban regeneration in 2015, and is carrying out various urban regeneration projects.

As with all public projects, especially in urban regeneration projects that aim to restore comprehensive urban functions, stable and flexible financial support is of paramount importance. In other words, the budget should be sufficient in terms of the absolute size, and able to be intensively invested in the period when the financial demand is concentrated during the project implementation process (Yoo et al., 2013). In consideration of these points, in 2017 Seoul established 'Seoul Urban Regeneration Fund (SURF)' for the first time in Korea<sup>1</sup>. The Urban Regeneration Fund is expected to play a role as a financial tool suitable for urban regeneration

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<sup>1</sup> Although there were discussions on establishing the Urban Regeneration Fund even when SAUR was enacted in 2013, it was removed from the bill due to the problem of securing financial resources, so SURF is the first case of both the central and local governments.

projects by overcoming the limitations of the current budgeting system because it can be operated more flexibly than the budget. However, due to a disagreement with the budget department on the necessity of the urban regeneration fund, and the lack of utilization plans and financial resources, the urban regeneration project is not effectively supported. Legally, the fund is operated separately from the budget, but in practice, it requires the final approval of the budget department, so friction with the budget department causes many conflicts at the stage of fund compilation. And since the SURF was newly established, the fund is not being used efficiently as it has followed the existing budget usage method for its operation. In addition, due to the size of the fund, which is less than 20% of the total budget for urban regeneration projects, it is urgent to prepare a plan to expand financial resources for SURF.

Therefore, this study attempts to derive a plan that the Seoul Urban Regeneration Fund can more effectively support urban regeneration projects. To this end, this study analyzes the current operating status of the Seoul Urban Regeneration Fund and evaluates its performance. In addition, based on the fund management evaluation results, measures to efficiently utilize the urban regeneration fund and expand financial resources in the mid-to-long-term<sup>2</sup> will be reviewed by dividing into the utilization of surplus assets and application of governance. Through this, policy alternatives are proposed for the urban administration of Seoul in the future with respect to the operation of the Urban Regeneration Fund. Specifically, for the use of surplus assets, this report will analyze the validity of stock investment proposal, which was designed based on the co-movement of Korean-US stock prices. Based on the results of the analysis, recommendations will be made to make policy decisions on whether to accept the proposal. In

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<sup>2</sup> The Fund is an exception to the principle of unity, which requires that the budget be structured to unify revenues and expenditures into a single account; the SURF's surplus assets can be utilized and accumulated beyond one fiscal year during the fund's lifetime (The duration of the fund is 5 years unless there are special circumstances, after which it can be extended in increments of 5 years through reevaluation.).

addition, in relation to the use of SURF and diversification of financial resources, an alternative to urban management policy will be provided by presenting an application model according to the life cycle of the urban regeneration project.

## **2. Background**

Seoul, the capital of Korea, has grown into a world-class megacity after half a century with unprecedented rapid development after the Korean War. In the process, various urban problems - the disappearance of the characteristics of the city, the continuation of the physical decline of the region, the decrease in the base of the support population due to the deterioration of the living environment, and the weakening of its status as an economic center - were revealed. In order to solve the decline of the existing downtown area, the Korean government carried out urban redevelopment projects in metropolitan areas and small and medium-sized cities, including Seoul, starting with the legalization of urban redevelopment projects in the early 1970s (J. Kwon & Kim, 2014). However, despite the government's efforts, many side effects such as the polarization of wealth, the decline in cities, and environmental deterioration have not disappeared.

Urban regeneration, which has emerged as an alternative to the failure of urban redevelopment policies, pursues gradual and conservative urban management in order to minimize the side effects of the existing urban redevelopment of the total demolition method. For this reason, urban regeneration projects take a long time to complete. In addition, this is even more so in the case of smart cities, which have recently become a hot topic in urban management.<sup>3</sup> This is because, in the case of smart cities, the area is wider from the urban

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<sup>3</sup> Although the definition of a smart city varies from country to country, it has been summarized as a concept that appropriately utilizes the latest technology and knowledge available in order to successfully solve the problems facing cities and develop cities in a future-oriented way (Kang, 2015).

planning stage to the reorganization of the existing infrastructure. However, the current system is not ready to accommodate this new paradigm. The loss of policy consistency due to regime change, changes in regional needs due to changes in demographic composition, and changes in urban functions due to changes in the industrial ecosystem make long-term urban regeneration projects more difficult. However, a more realistic and serious problem than that is the budget system of the administration, which operates in an incremental manner.

As mentioned above, the number of areas in need of regeneration is still large, and changes in social and economic environment affect the cycle of each urban regeneration project, so many urban regeneration projects can be implemented simultaneously at a specific time. On the other hand, urban regeneration projects, which are carried out in stages such as preparation, planning, and project implementation, require a lot of budget at specific stages. As a result, if the project implementation phase is carried out in several regions at the same time, the demand for the budget will be explosive compared to the previous year. However, the current budget system adopts an incremental method of increasing or decreasing through fine adjustments based on the previous year's budget and thus cannot handle such a rapid increase in budget. Moreover, unlike the original plan, it becomes more difficult to adjust the cycle of each project to fit the budget when obstacles to project promotion, such as opposition by residents or delay in compensation, occur. In fact, since 2017, when phase 1 and phase 2 projects began to overlap, there was a situation in which the project period had to be extended or part of the project had to be carried over to the next year due to lack of budget (M. Park, 2017). Accordingly, Seoul is seeking ways to use the Urban Regeneration Fund more efficiently and effectively.

### **3. Structure of the report & Data**

This paper consists of a total of 5 chapters. Following the introduction of Chapter 1 on the purpose and background of this study, Chapter 2 examines the results of previous research on Fund management and the utilization of Funds for local governments in Korea. Next, in Chapter 3, Current Status and Evaluation, the operating performance of SURF from 2018 to 2019 will be evaluated. In Chapter 4, SURF Utilization Plan, based on the evaluation results in Chapter 3, the feasibility of SURF's surplus fund investment plan is analyzed and a new model related to SURF utilization is presented. Finally, in Chapter 5, after drawing conclusions and implications, the report concludes with the limitations of this study and future tasks.

In detail, the evaluation of fund management analyzes flexible financial management and efficient use through SURF. The analysis examines how flexible the fund was managed by looking at the increase in expenditures compared to the previous year and the increase or decrease in expenditures compared to the plan for the year, and how efficiently the fund was utilized by examining the status of the surplus asset management and investment patterns. Research data from 2018 to 2019 on the appropriation and settlement of SURF are collected from the annual fund operating plan, settlement statement, and related official documents published on the Seoul City website.

Regarding the use of surplus assets, the effectiveness of investment in securities using the co-movement between Korea-US stock price which has been proposed to Seoul is analyzed. For the analysis, Pearson correlation analysis and multiple regression analysis are conducted using daily stock price data of Korea and the United States from January 2010 to September 2019. As the independent variable of the multiple regression analysis, the US stock price data of S&P500 and DJIA published on the website of the Saint Louis Federal Reserve are used. And as an

independent variable, KOSPI200 Korea stock price data disclosed on the Korea Stock Exchange is used.

## **II. Literature review**

### **1. Fund management**

As mentioned earlier, since the fund<sup>4</sup> is recognized as an exception to the principle of budget unity, there is a high concern that the fund may result in a complex fiscal structure and undermine fiscal transparency and efficiency. It is pointed out that the complicated fiscal structure makes it difficult to allocate the first resources to projects that are of high importance in budget execution. In addition, it is known that the problem of duplication of projects that are supported financially by the budget and fund may hinder fiscal transparency and efficiency. The studies summarized below are studies that have analyzed these problems pointed out in relation to the fund and considered way to improve the fund management.

There are studies on the direction of reorganization between budget accounts and funds promoted by the past government. First of all, Man-Woo Lee et al. (2001) proposed desirable role division standards between general account, special account, and fund and rearranging plan based on the actual situation analysis of the problem of duplication of fund and budget, and the issue of support for the fund of general account and special account. They also argue that as a reorganization plan, based on financial operations centered on general accounts, special accounts

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<sup>4</sup> There may be misunderstandings about what 'fund' means because the word 'fund' was used in a somewhat different meaning in Korea and the United States. In the U.S., 'fund' generally refers to the amount of money that can be saved or used for a specific purpose (the term 'fund' in this sense is called 'Ja-geum' in Korean), whereas in Korea, 'fund' is the name of an independent system that contrasts with the budget, all of which correspond to a revolving fund in the U.S. (the term 'Fund' in this sense is called 'Gi-geum' in Korean). In this report, SURF is indicated only as SURF. Thus, the 'fund' here in the literature review section does not refer to SURF. This is because there is no research on SURF since it has a short history. However, SURF is also a type of fund and there are many studies based on the common characteristics of the fund. Therefore, this paper deals with previous studies on the subject of common characteristics applicable to SURF.



and funds should be limitedly installed and operated only for the “purpose of using specific revenues in connection with specific expenditures”, and similar accounts and funds should be consolidated and closed (M.-W. Lee et al., 2001). Young-sun Ko and Seong-il Jo (2004) pointed out that the number and scale of contributions to finance various special accounts and funds are increasing. And in order to improve the efficiency and transparency of fiscal management, they argued that general accounts, special accounts, and funds should be restored so that they can be managed according to their original purpose. To this end, it was proposed to integrate the fund and special accounts into general accounting unless there is an inevitable reason to exist. The fund was categorized into four groups, and reorganization plans were suggested according to the nature of each type of project (Ko & Jo, 2004).

Ki-young Park (2014) conducted a study on the management system of the fund and considered that the fund is a system that is recognized as an exception to national finance, so it should be installed and operated only when necessary through a strict review process. To this end, it clarified the timing of the end of the fund and insisted on strengthening the effectiveness of the sunset regulation, which would require rigorous deliberation in case of extension. He also reviews ways to specify the basis of the fund in the Constitution when considering the proportion and role of the fund and emphasizes the division of roles between general account, special account, and fund in order to establish a system to manage the entire national finance. In addition, he argued that the integrated financial management, which encompasses these, should be reinforced to prevent duplication with budgetary projects and to enhance the efficiency and transparency of fiscal expenditures (K. Park, 2014).

Suwan Hong and Byeol-ah Yoon (2015) conducted a study to determine the soundness of the fund by grasping the income and expenses of the fund. For the analysis, income and

expenditure were analyzed after reorganizing the existing income and expenditure classification method according to the IMF's GFSM (Government Finance Statistics Manual) 2001 accrual accounting principles. In addition, the fund balance, an indicator of the sustainability of government operation, was presented, and based on this, the financial risk of individual funds was analyzed. Based on the results of the analysis, they suggest that the entity that operates the fund and the organizations that control it should efficiently manage their finances by discovering their own sources of income or realigning their businesses centered around core projects so that they can operate the fund according to its original purpose<sup>5</sup>. In addition, it was proposed to consider a plan to consolidate and abolish funds that do not meet the purpose of the fund system into the budget and to introduce an income and expenditure structure suitable for the fund balance in the settlement of the fund (Hong & Yoon, 2015).

As discussed above, most of the previous studies related to the fund were mainly about management aspects such as the abolition of the fund when the boundary between the budget and the fund is unclear. However, this report is differentiated in that it focuses on the aspect of flexible fiscal operation, which is one of the purposes of establishing the fund.

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<sup>5</sup> Funds, as a system in contrast to the budget, can be established when flexible financial operations are needed to achieve specific objectives. However, this previous study discovered cases in which some funds (Science and Technology Promotion Fund, Military Welfare Fund, Fisheries Development Fund, etc.) do not require flexible financial operation due to the nature of the project. In particular, by analyzing the characteristics of sub-projects that make up one project, they argued that only core projects that require flexible financial management should be covered by funds. In the case of the Science and Technology Promotion Fund, they said that only new R&D support projects should be covered by the fund, and existing R&D support projects and research institute operations should be excluded. In addition, if all sub-projects, such as the Military Welfare Fund, did not require flexible financial management, they recommended that the fund itself be abolished and incorporated into the budget. In addition, it pointed out the problem that budgets and funds are allocated redundantly to the same project, complicating the financial structure and making it difficult to determine the overall size of the project. They advised not to allocate the budget redundantly for projects for which the fund was already allocated, and insisted that the part that was previously covered by the budget should be solved by itself through the expansion of the fund's resources. For example, they insisted that the Fisheries Development Fund stop allocating the budget for the fishery safety management and fishery price stabilization projects, excluding the fishery resource damage recovery project, and to cover it through an increase in the aquaculture license tax, which is the source of the fund. They also argued that the above roles should actually be performed by the business unit and the fund control unit through dual surveillance.

## 2. Utilization of Funds

The utilization of the fund should be reviewed in two main ways. One is how to invest the Fund itself into the project. This is because the effectiveness of the Fund supporting the project may vary depending on the structure and management method of the Fund. The other is how to secure and utilize the Fund's funding source. This is mainly related to the use of the Fund's surplus assets and diversification of financial resources.

Soon-Hyun Kwon (2008) emphasized the efficient management of local funds<sup>6</sup>, pointing out that local funds account for more than 15% of the total finance of local governments, and their scale is increasing year by year. He first suggested that if the general budget and the fund project overlap, the project should be unified, and for this, the scope and nature of the project between the fund and the general budget should be clarified. He also argues that regulations should be put in place so that budget projects and fund projects cannot overlap with each other, and the project review function of local councils should be strengthened to prevent overlapping support. Second, it argues that the regulation that restricts the fund's own purpose business to the limit of interest income should be abolished. This is because these restrictions increase unnecessary reserves, such as allowing local governments to further increase the size of the fund to secure the financial resources of the fund projects. Third, since most of the surplus assets are deposited as time deposits in the bank, it is emphasized that integrated management is necessary. In the case of individual local governments, an integrated management fund should be established and utilized for financial loans or repayment of local bonds, or a plan for more efficient use by consolidating funds should be devised. Also, in the long term, it is necessary to

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<sup>6</sup> Here, the local fund refers to a fund established and operated by local governments. In addition, the finance of local governments consists of budgets and funds. For more details, please refer to 'Establishment of the SURF' Part (III-1-1)) of this report.

prepare a plan to efficiently utilize the funds by consolidating the surplus assets of individual local governments through the establishment of the regional development cooperation fund and by making loans to other local governments or entrusting them to asset management experts. In addition, it is emphasized that education related to asset management should be provided for fund managers of each local government (S.-H. Kwon, 2008).

Wonhee Lee and Hyunmi Gwak (2012) point out that the definition of the fund's surplus asset is too narrow, and provide a more expansive definition of the surplus asset. They divide the type of fund into four categories, define the surplus asset, and suggest ways to use it. First, in the case of a business fund, it is deposited in a financial institution, and the interest accrued from it is mainly the surplus asset, and in the case of a fund that conducts a loan business, the reserve that exceeds the actual financing is defined as the surplus asset. In this case, they argue that if the loan business is converted to an interest difference preservation business, the reserves can be used more actively and the scope of the surplus assets can be much larger. Second, they argue that it is difficult to use the funds from the social insurance fund as surplus assets. This is because even if there is no immediate demand for expenditure, it should be approached as a concept of debt for the future. Third, in the case of the account-type fund, it will be a surplus asset if it has accumulated more than the necessary funds. Fourth, it is argued that a cautious approach is necessary even in the case of the financing fund. Since these funds are raised by the burden of the people, they recommend that the boundary between finance as a loan business and finance as a public business should be clarified through fund evaluation (W. Lee & Gwak, 2012).

Ji-heon Shim (2015) examined the current status of surplus asset management by the fund and analyzed the appropriateness and management status of surplus asset holdings (Shim, 2015). And the report conducted by Hyunsoo Kim et al. (2015) examines whether the target rate

of return calculation and asset allocation process of domestic pension funds is appropriately performed, and proposes to reflect the appropriateness of the target rate of return and target rate of return of each pension fund in the fund management evaluation (H. Kim et al., 2015).

Changsoo Jung and Sangmin Lee (2019) studied ways to improve the efficiency of local governments' spare resources through Investment Pool for Public Funds<sup>7</sup>. They analyzed the local government's written settlement of accounts and financial statements in 2018 and pointed out that 42% of the local government's surplus assets were held as cash or cash equivalents, which was inefficient in terms of generation from assets. And local governments are encouraged to join the Investment Pool for Public Funds, confirming that the return rate of the Investment Pool for Public Funds operated by the central government was higher than the surplus asset investment method operated by individual local governments. In addition, they emphasize the increasing proportion of stock-type investment products in addition to stable investment products such as bond-type and argue for the need for aggressive fund management (Jung & Lee, 2019).

As reviewed above, most of the existing studies on the use of funds have focused on the scope and status of surplus assets and the problem of redundant investment. In addition, it can be seen that in relation to the use of surplus assets, the focus is on the comparison of the overall rate of return, or the merit of central government's integrated management. This study is differentiated from the previous studies in two aspects. One is that it analyzes the validity of the surplus asset investment plan concretely and empirically. Previous studies have ended up in abstract claims that the return on investment from surplus assets should be increased. However,

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<sup>7</sup> The Investment Pool for Public Funds was introduced in 2001 as a system for the central government to increase the efficiency of management by integrating the surplus assets held by all levels of government into one. This includes MMF, short-term integrated MMF, bond type, mixed type, domestic stock type, and overseas stock type products (Investment Pool for Public Funds, n.d.).

this report deals with an actual investment proposal, based on Korea-US stock price co-movement, raised for SURF. The other is that this study pays attention to the utilization of the SURF itself, which has not been addressed by previous studies. In other words, existing studies focused only on the financial efficiency aspect of the fund, and there was a problem that the connection with the target project was loose. However, this study examines how to effectively support the target project by paying attention to the use of the fund itself. Specifically, it is meaningful in that it proposes a new model to make use of the SURF step by step of the urban regeneration project. This model provides ways to not only effectively utilize SURF itself but also diversify its financial resources by securing revenue sources from the private sector through linkage with governance.

### **III. Current status and Evaluation**

#### **1. Seoul Urban Regeneration Fund**

##### **1) Establishment of the SURF**

Funds of Korean local governments are specific funds held and operated for specific projects, not based on revenue and expenditure budgets to achieve specific administrative purposes. This is to enable flexible management of financial resources, free from the general restrictions of local fiscal laws. In the past, local government funds were autonomously operated by local government ordinances based on the Local Autonomy Act and Local Finance Act. However, as the Local Finance Act was separated into four laws in August 2005, the 'Framework Act on the Management of Local Government Funds' was enacted separately, which has been the legal basis for local funds.

[Table 3-1] Local government's financial structure and legal system

| Components of local finance |   | Legal system   |
|-----------------------------|---|--|
| Local Finance               | Budget <ul style="list-style-type: none"> <li>General Accounts</li> <li>Special Accounts</li> </ul> | <ul style="list-style-type: none"> <li>▪ Installation : Local Finance Act</li> <li>▪ Operation : Enforcement Decree of the Local Finance Act</li> <li>▪ Details : Individual Laws and Regulations</li> </ul>                                       |
|                             | Fund  | <ul style="list-style-type: none"> <li>▪ Installation : Local Autonomy Act, Individual Laws</li> <li>▪ Operation : Framework Act on the Management of Local Government Funds</li> <li>▪ Details : Local Government Ordinances and Rules</li> </ul> |

The fund has a management system different from the general and special account budgets. The budget is processed according to the single-year principle by matching revenues and expenditures, but the fund is managed separately in the fundraise and operation. The fundraising represents the state of property at a certain point in time, and the management is the concept representing the operating situation for one year. In other words, fundraising is a cumulative concept of the capital held by the fund, whereas fund management consists of one-year income and expenditure. Funds also have different characteristics from budgets in their establishment and execution. First of all, it has higher autonomy compared to the budget in terms of planning. Both the fund and the budget are the same in that they must be deliberated and finally determined by the local council. However, the fund is confirmed as an agenda by the decision of each Deliberative Council on Fund Management only after consultation with the fund management department. In this case, the consultation by the fund management department and the deliberation by the Deliberative Council on Fund Management are usually not conducted strictly. In contrast, the budget is confirmed as an agenda by the deliberation of the budget

department. In this process, the amount of the budget requested by each department are reduced and adjusted. In addition, the fund is more flexible than the budget in terms of execution. If the project plan needs to be changed, the budget should be made up of a supplementary budget and passed through the resolution of the local council. However, within the range of 20% of the expenditure of the fund, it is possible to change the fund management plan without the decision of the local council. In terms of expenditures, the budget is integrated in the city safe and expenditures are made according to strict procedures, such as by the cause of expenditure. However, funds can be expended directly by the head of the fund operating department, so the execution of funds is made quickly and flexibly.

[Table 3-2] Comparison of budget and fund

|                      | General Accounts  | Special Accounts   | Fund   |
|----------------------|---|--|--|
| Establishment        | <ul style="list-style-type: none"> <li>▪ General financial activities</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Cover specific expenditures with specific revenues</li> <li>▪ Operating specific funds for specific projects</li> </ul> | <ul style="list-style-type: none"> <li>▪ Operating specific funds for specific purposes</li> </ul>   |
| Resource & Operation | <ul style="list-style-type: none"> <li>▪ Local tax income</li> <li>▪ Provide free benefits</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Mixed general account and fund management</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Various sources of income such as contributions</li> <li>▪ Specific project, loan business, etc.</li> </ul> |
| Determination        | <ul style="list-style-type: none"> <li>▪ Formation of budget general department</li> </ul>  |  | <ul style="list-style-type: none"> <li>▪ Resolution of Deliberative Council on Fund Management</li> </ul>  |
| Execution            | <ul style="list-style-type: none"> <li>▪ Control based on legitimacy</li> <li>▪ prohibiting use for purposes other than budgetary purposes</li> </ul> |  | <ul style="list-style-type: none"> <li>▪ Control by suitability for purpose</li> <li>▪ Autonomy and resilience guaranteed</li> </ul>                 |
| Connectivity         | <ul style="list-style-type: none"> <li>▪ Exclusion of linkage of specific revenue and expenses</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Specific revenue and expenditure can be linked</li> </ul>   |  |
| Modification         | <ul style="list-style-type: none"> <li>▪ Supplementary Budget : Resolution of Local Council</li> </ul>  |  | <ul style="list-style-type: none"> <li>▪ Expenditure less than 20% : Resolution of Deliberative Council on Fund Management</li> </ul>                |
| Settlement           | <ul style="list-style-type: none"> <li>▪ Local council approval</li> </ul>  |  |  |

\* Source: 2020 local government budgeting and operating standards and fund management plan establishment standards, 2019



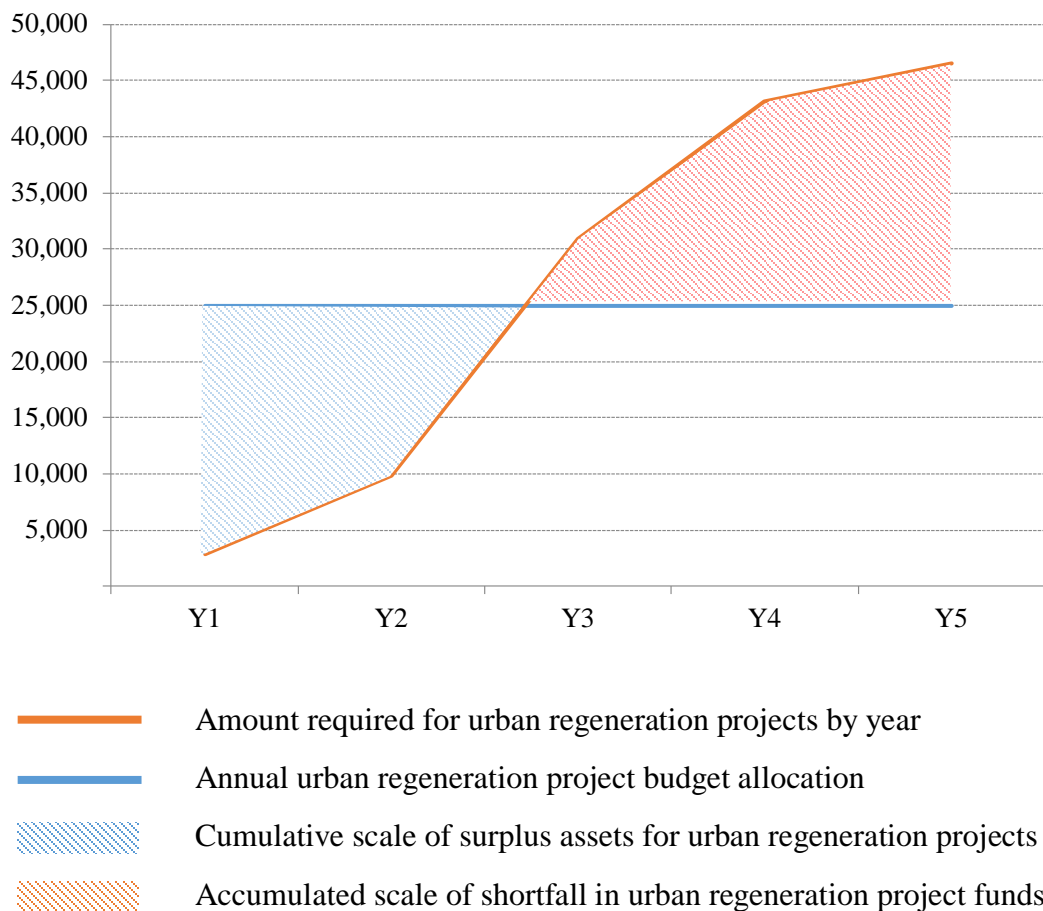
The city of Seoul established the Urban Regeneration Fund in 2017 to facilitate urban regeneration projects by utilizing the characteristics of these funds. The purpose of establishing the Urban Regeneration Fund was to overcome the limitations of the single-year budget system, which does not reflect the characteristics of urban regeneration projects, which take a long time from planning to implementation of the project. This is because the annual budget system had a side that hindered the consistency and stability of urban regeneration projects over many years. In fact, in the early stages of urban regeneration projects, where the role of the public sector is high, it is inevitable to invest public budgets. Meanwhile, the financial burden of the urban regeneration project increases sharply after the second year when the project becomes concrete and full-fledged compared to the first year, which is the planning stage. As a result, under the current system, where similar budgets are given each year, the budget exceeds expenditure in the first year, and expenditure exceeds the budget in the second year, and the project is to be hampered. Of course, there is a system in which the remaining budget from the first year is carried over to the second year, but due to the nature of large-scale funds, in order to use this system a contract for construction to be performed in the second year must be signed in advance. However, when the budget for the second year is being formed, it is difficult to complete even planning, let alone a construction contract, so most of the budget is not used instead of being carried over.

Figure 3-1 shows the expected effects of the establishment of the Urban Regeneration Fund. Under the current budget system, where 25 billion won of financial resources are given each year, the budget remains unused until the second year of the project, and after that, the budget is insufficient, which impedes project promotion. However, if this is managed as a fund,

the remaining resources until the second year can be accumulated as surplus capital in the fund, and can be used after the third year when the demand for project expenses increases rapidly.

[Figure 3-1] Expected effects of establishing the Urban Regeneration Fund

(In millions of Korean won)



As a result, it is possible to effectively respond to fluctuations in annual project cost demand, enabling smooth business promotion. In the end, the use of these funds is a way to increase the efficiency of finite allocation diachronically.

Another purpose of the Urban Regeneration Fund was to provide flexible fund management suitable for urban regeneration projects that frequently change plans due to external factors other than the project itself. In fact, administrative controls such as conservatism of incremental budgeting, transferred use and re-appropriation of budget were hindering the efficiency and elasticity of project finance management. The most representative case appeared in the construction of anchor facilities. Anchor facility refers to a facility that is the basis for sustainable urban regeneration that is built on the basis of strong spatial linkage with urban regeneration areas. In order for local governments to effectively establish such anchor facilities, the relevant land or buildings must be purchased quickly at the early stage of the project. This is because if the purchase of anchor facilities is delayed, the owner's expectation of an increase in value is reflected, and the price may skyrocket and even cause side effects such as generating speculative demand in the region.

Table 3-3 shows the actual status of anchor facilities purchased by the Seoul Metropolitan Government from 2015 to 2016. As can be seen from the table, real estate prices, which have not changed significantly over the past three years, have risen significantly at the time of actual purchase.

[Table 3-3] Anchor Facility Purchase list

(In millions of Korean won)

| Urban Regeneration<br>Area | Officially Assessed Price |        |        | Actual purchase price |          |
|----------------------------|---------------------------|--------|--------|-----------------------|----------|
|                            | 2014.1                    | 2015.1 | 2016.1 |                       |          |
| Haebangchon                | 406                       | 445    | 488    | 1,108                 | (‘16.8)  |
| Garibong                   | 476                       | 458    | 465    | 625                   | (‘15.12) |
| Seongwak Maeul             | 145                       | 153    | 156    | 286                   | (‘16.3)  |

\* Source: *Seoul Urban Regeneration Fund establishment and operation plan, 2019*

The main reason for this phenomenon is that it was not possible to quickly replenish the insufficient funds for the purchase of anchor facilities due to the complicated and difficult budget change procedure. As discussed above, this is because, within the current budget system, if the project area is different, the decision of the local council is required when the budget is changed. Therefore, the Urban Regeneration Fund was needed to flexibly manage financial resources within the same fiscal year. In the end, the use of these funds is a way to increase the efficiency of limited resource allocation synchronically.

However, the establishment of such an urban regeneration fund was not a smooth progress. Discussions on the necessity of the Urban Regeneration Fund began in 2014, but there was little progress due to disagreement between departments and difficulties in securing financial resources. Then, as the Urban Regeneration Headquarters was formed in 2015 and the actual urban regeneration project was implemented, SURF was established after four years of twists and turns for the first time in Korea.

## 2) Operation Status of the SURF

The revenue of the fund has a variety of sources such as taxes, non-tax revenue, income from inter-account transactions, investment income from surplus assets, and liabilities. However, SURF's revenue sources are not diverse. SURF, which was first established in 2017, has been operated since 2018 after a preparation process.

Table 3-4 and Table 3-5 show the revenue settlement of SURF in 2018 and 2019, respectively. As shown in the table, SURF's source of revenue entirely consists of a charge out of temporary non-tax revenue. Nevertheless, SURF's collection performance against the levy plan was very low at 65.6% in 2018 and 52.9% in 2019.

[Table 3-4] 2018 Urban Regeneration Fund revenue

(In millions of Korean won)

| Item (2018)               | Planned Revenue |              | Carried-over (b) | (a)+(b) | Determined Collection | Amount Received   |            |           |
|---------------------------|-----------------|--------------|------------------|---------|-----------------------|-------------------|------------|-----------|
|                           | Initial         | Modified (a) |                  |         |                       | Total Receipt (c) | Refund (d) | (c) - (d) |
| Total                     | 33,897          | 33,897       |                  | 33,897  | 22,249                | 22,249            |            | 22,249    |
| Non-Tax Revenue           | 33,897          | 33,897       |                  | 33,897  | 22,249                | 22,249            |            | 22,249    |
| Current Non-Tax Revenue   |                 |              |                  |         | 45                    | 45                |            | 45        |
| Interest                  |                 |              |                  |         | 45                    | 45                |            | 45        |
| Temporary Non-Tax revenue | 33,897          | 33,897       |                  | 33,897  | 22,205                | 22,205            |            | 22,205    |
| Charges                   | 33,897          | 33,897       |                  | 33,897  | 22,205                | 22,205            |            | 22,205    |

\* Source: 2018~2019 fund management plan & written settlement of SURF management

In 2019, new sources of revenue such as interest and deposit declamation, in addition to a charge, appeared, but this is only ancillary income from the previous year's fund operation. As shown in Table 3-5, these tax sources were not originally included in the fund management plan.

[Table 3-5] 2019 Urban Regeneration Fund revenue

(In millions of Korean won)

| Item (2019)                   | Planned |              | Carried-over (b) | (a)+(b) | Determined Collection | Amount Received   |            |           |
|-------------------------------|---------|--------------|------------------|---------|-----------------------|-------------------|------------|-----------|
|                               | Initial | Modified (a) |                  |         |                       | Total Receipt (c) | Refund (d) | (c) - (d) |
| Total                         | 37,672  | 42,808       | 7,515            | 50,323  | 22,652                | 22,652            |            | 22,652    |
| Non-Tax Revenue               | 37,672  | 37,823       |                  | 37,823  | 10,153                | 10,153            |            | 10,153    |
| Current Non-Tax Revenue       |         | 151          |                  | 151     | 151                   | 151               |            | 151       |
| Interest                      |         | 151          |                  | 151     | 151                   | 151               |            | 151       |
| Temporary Non-Tax revenue     | 37,672  | 37,672       |                  | 37,672  | 10,002                | 10,002            |            | 10,002    |
| Charges                       | 37,672  | 37,672       |                  | 37,672  | 9,810                 | 9,810             |            | 9,810     |
| Others                        |         |              |                  |         | 192                   | 192               |            | 192       |
| Indemnification Revenue etc.  |         | 4,984        | 7,515            | 12,499  | 12,499                | 12,499            |            | 12,499    |
| Indemnification Revenue       |         | 384          | 7,515            | 7,899   | 7,899                 | 7,899             |            | 7,899     |
| Carry-Over from Previous Year |         |              | 7,515            | 7,515   | 7,515                 | 7,515             |            | 7,515     |
| Deposit Reclamation           |         | 384          |                  | 384     | 384                   | 384               |            | 384       |
| Inter-Account Transaction     |         | 4,600        |                  | 4,600   | 4,600                 | 4,600             |            | 4,600     |
| Inter-Account Loan            |         | 4,600        |                  | 4,600   | 4,600                 | 4,600             |            | 4,600     |

\* Source: 2018~2019 fund management plan & written settlement of SURF management

In addition, interest, which accounts for entire current non-tax revenue in 2019, is the income obtained by depositing funds in banks. Specifically, looking at the details, only the interest on the time deposits of the Seoul city's main bank is retrieved as revenue.

Meanwhile, there are no special restrictions except that the expenditure of the fund must be used for the purpose of the fund itself. However, the purpose of establishing SURF was to efficiently support urban regeneration projects by utilizing the elasticity of the fund as much as possible, so it is necessary to have an expenditure structure corresponding to this. Table 3-6 and Table 3-7 show the expenditure settlement of SURF in 2018 and 2019, respectively.

[Table 3-6] 2018 Urban Regeneration Fund expenditure

(In millions of Korean won)

| Item (2018)                     | Planned Expenditure |              | Carry over (b) | (a)+(b) | Actual Expenditure | Carry-Over Expenditure |
|---------------------------------|---------------------|--------------|----------------|---------|--------------------|------------------------|
|                                 | Initial             | Modified (a) |                |         |                    |                        |
| Total                           | 33,897              | 33,897       |                | 33,897  | 14,728             | 7,521                  |
| Urban Regeneration Headquarters | 33,897              | 33,897       |                | 33,897  | 14,728             | 7,521                  |
| Regional Development            | 33,897              | 33,897       |                | 33,897  | 14,728             | 7,521                  |
| Urban Regeneration Invigoration | 33,887              | 33,887       |                | 33,887  | 14,344             | 7,515                  |
| Administrative Operation        | 10                  | 10           |                | 10      |                    | 6                      |
| Financing Activities            |                     |              |                |         | 384                |                        |

\* Source: 2018~2019 fund management plan & written settlement of SURF management

The most remarkable feature of SURF's spending structure is that the proportion of urban regeneration Invigoration items is very high (more than 99.9%). This is to be to make the most of the elasticity of the fund. As discussed above, the fund divides the change process based on the items. In other words, if the items are the same, the change within 20% of the expenditure goes through a simpler procedure. However, if the items are different, the resolution of the local council must be obtained regardless of the scope of the change in the amount of expenditure. As a result, the city of Seoul includes all expenditures except for general expenses, which are basically required to operate the fund, in one major item of Urban Regeneration Invigoration. This enables departments in charge of the project to go through a more rapid change process if they need to change the fund management plan.

[Table 3-7] 2019 Urban Regeneration Fund expenditure

(In millions of Korean won)

| Item (2019)                     | Planned Expenditure |              | Carry over (b) | (a)+(b) | Actual Expenditure | Carry-Over Expenditure |
|---------------------------------|---------------------|--------------|----------------|---------|--------------------|------------------------|
|                                 | Initial             | Modified (a) |                |         |                    |                        |
| Total                           | 37,672              | 42,808       | 7,515          | 50,323  | 20,809             | 1,843                  |
| Urban Regeneration Headquarters | 37,672              | 42,808       | 7,515          | 50,323  | 20,809             | 1,843                  |
| Regional Development            | 37,672              | 42,808       | 7,515          | 50,323  | 20,809             | 1,843                  |
| Urban Regeneration Invigoration | 37,662              | 42,798       | 7,515          | 50,313  | 15,754             | 1,843                  |
| Administrative Operation        | 10                  | 10           |                | 10      | 8                  |                        |
| Financing Activities            |                     |              |                |         | 5,047              |                        |

\* Source: 2018~2019 fund management plan & written settlement of SURF management

On the other hand, looking at SURF's expenditure details, the proportion of actual expenditure compared to the plan is very low. It was only 43.4% in 2018 and 41.4% in 2019. This is to be attributable to the errors in the revenue estimation previously examined along with the change in the expenditure plan due to changes in external conditions. In fact, the operation plan of SURF has been changed 10 times in 2018 and 16 times in 2019.

## 2. Fund management evaluation

### 1) Revenue

Reviewing the operation status of SURF, there are two main problems in terms of revenue. One is that the revenue structure is simple, and the other is that the use of surplus asset is passive. First of all, it consists of an excessively simple structure with only the overconcentration charge as a revenue source. As mentioned above, it is difficult to introduce an actual system compared to the necessity of the Urban Regeneration Fund. There are many reasons for this, but the biggest one is that it is difficult to find new revenue sources. For this



reason, SURF's revenue sources consist only of overconcentration charge among non-tax revenues, not taxes. Of course, revenues from interest and inter-account transaction also exist, but the proportion is insignificant. Such a small number of sources of revenue can cause a major obstacle to fund management depending on the collection performance in the future. In fact, SURF's collection performance against the levy plan was very low at 65.6% in 2018 and 52.9% in 2019.

The overconcentration charge is a charge for policy purposes to suppress the concentration of the population in the metropolitan area and induce a balanced development between regions. This is imposed on those who want to construct large buildings that cause population concentration in the metropolitan area. Therefore, when a person who intends to build a structure submits an application for building permit to local government, a certain amount is calculated according to the type and scale of the building. This means it is unlikely that the subject of levy will be omitted. Nevertheless, the reason for the low collection performance is that the due date for payment of the levy is the time of completion of the building. In other words, it is difficult to accurately predict when the payment will be made, since it takes from one year to several decades from the time of building permit to completion. In this situation, SURF establishes an expenditure plan for 100% of expected revenue every year, so it is inevitable that the urban regeneration project is disrupted in case of low collection.

In order to solve this problem, it is necessary to diversify financial resources. The most desirable way is to increase stability by securing taxes as a revenue source. However, it is not easy to incorporate a tax that has already been being used as a revenue source for other general or special accounts into SURF's unless a new tax is incurred. Instead, other alternatives can be derived if the purpose and effect of the urban regeneration project are fully utilized. In other

words, urban regeneration aims to revitalize the area by improving the physical, economic and cultural environment of the city. Therefore, if economic revitalization is achieved through public funds, then a plan can be considered to operate the fund using private resources from the region benefited from the project. Of course, the funds raised in this way will be reinvested in the region, which forms a virtuous cycle. In the end, this is the diversification of SURF's financial resources through governance, which is covered in more detail in Chapter 4.

Another problem with SURF revenue management is that the use of the surplus asset is too monotonous and passive. The surplus asset refers to the remainder excluding the amount of money required for the project itself, daily operation, loans, and acquisition of properties, etc. This is largely divided into long-term and temporary. Long-term surplus asset arises when the revenue for a given fiscal year exceeds the expenditure required necessary to achieve the purpose of the fund for that year. On the other hand, the temporary surplus asset is generated due to the difference between the time of revenue and expenditure and is usually not large. Therefore, the main target of surplus asset management is a long-term surplus asset. The management of the long-term surplus asset is carried out by investing in high-interest-rate products such as periodic deposits, savings deposits such as CDs, and government bond investments in the main bank of the government in order to ensure the stable operation of the fund. However, in 2018 and 2019, all of SURF's surplus assets are held in the time deposits of the main banks.

Table 3-8 shows the fundraising status of SURF. As can be seen from the table, the full amount of the year-end surplus assets is deposited in the main bank. Among them, short-term surplus assets are deposited in demand deposits, and long-term surplus assets are deposited in term deposits.

[Table 3-8] The fundraising status of SURF

(In millions of Korean won)

| Year | Amount Raised       |              |        | Amount used in the current year | Amount at the end of the year | Status of surplus fund management |
|------|---------------------|--------------|--------|---------------------------------|-------------------------------|-----------------------------------|
|      | Until previous year | Current year | Total  |                                 |                               |                                   |
| 2018 |                     | 22,249       | 22,249 | 14,350                          | 7,899                         | Deposit in the main bank(7,899)   |
| 2019 | 7,899               | 14,753       | 22,652 | 15,762                          | 6,890                         | Deposit in the main bank(6,890)   |

\* Source: 2018~2019 fund management plan & written settlement of SURF management

In other words, the Seoul Metropolitan Government is leaving the SURF's surplus asset unattended by depositing it in the bank, which is the most passive form, for the occurrence of unexpected expending demand rather than actively utilizing it. In addition, since an annual expenditure plan for 100% of the estimated revenue is being devised, the use of the surplus asset is not fundamentally considered. Therefore, these passive investments are largely due to past practices and the lack of expertise of fund managers, rather than to prepare for unexpected expenditures and to avoid the risk of investment losses. This is because, due to the nature of SURF, in which all income is allocated into expenditures, new expenditure demand will not be replenished with surplus assets, but only through other methods of reducing existing expenditures, unless income increases.

Meanwhile, each local government can establish an Integrated Management Fund that integrates and manages the surplus assets of all funds they operate (Article 16 of the Framework Act on the Management of Local Government Funds). Seoul is managing a total of 23 funds including SURF. Among them, Financial Investment and Loan Fund was established as an integrated management fund, but this also only plays a role in reconciling the imbalance between each fund and account rather than investing to utilize the surplus assets. In the case of the

national government, all surplus assets are being managed by investing in bank deposits as well as bonds and stock through the Investment Pool for Public Funds. Of course, the proportion of equity-type investment is very low (2.1% as of the third quarter of 2020<sup>8</sup>) and is evaluated as a conservative investment method, but it is meaningful in that it provides a platform to diversify investment methods.

In order to solve this problem, a more active form of utilizing the surplus asset is needed. In 2015, when the city of Seoul was considering the establishment of SURF, the Urban Regeneration Headquarters, the department in charge of urban regeneration projects of Seoul, reviewed a fund management plan for the management of surplus assets with a proposal from an external agency. The content was to obtain a stable return on investment by taking advantage of the stock price co-movement between Korea and the US. However, the proposal was discarded without being reviewed as the establishment of SURF was frustrated at the time. In this regard, the review of the validity of the proposal as a way to actively utilize the surplus asset of SURF is covered in more detail in Chapter 4.

## **2) Expenditure**

As previously discussed in the SURF operation status, SURF's expenditure is structured to maximize the flexibility of the fund. In addition, the most fundamental purpose of the establishment of SURF was to support the smooth promotion of urban regeneration projects through the flexible use of financial resources. Therefore, it will be examined whether SURF is being operated in a flexible manner.

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<sup>8</sup> <https://investpool.go.kr/trustScITransitn.do>

### **(1) Methodology and data**

In terms of expenditure, the fund differs from the budget in that it is possible to back up projects with flexibility. Therefore, two analyses are performed to examine the flexible financial management through the fund. The first is to examine the flexible operation of the fund through the size of the increase or decrease in the amount of expenditure for SURF compared to the previous year. The second is to review the flexible operation of the SURF by analyzing the increase or decrease of expenditure for settlement compared to the current year plan. The analysis in both aspects is to check the changes from the time series and the cross-sectional perspectives of the flexible operation of the fund. Of course, it is the same as the budget in that the fund is determined through deliberation by the local council. However, the fund can be rolled over during its term of existence and can be changed within 20% of the expenditure without deliberation by the local council. Therefore, it is meaningful to examine both perspectives at the same time.

Based on empirical research, we will be able to evaluate whether SURF is operating flexibly within the same fiscal year and across several fiscal years. In other words, if the rate of change in the expenditure by year, and in the expenditure plan within the same fiscal year is large compared to the budget, we can evaluate that SURF is being operated flexibly in diachronic and synchronic perspective respectively. This is because the flexibility of fiscal operations depends on how much and how quickly expenditure and expenditure plans are adapted to fluctuations in project demand. On the other hand, if this is not the case, it will be important data in finding the cause that hinders the flexible operation of SURF and devising a solution. This is meaningful not only as basic data for evaluation in relation to the operation of SURF but also as a starting point for in-depth research on the role of SURF to effectively support projects in the

future. That is, even if SURF is evaluated as being financially efficient, it can actually help to derive an improvement plan that can support the urban regeneration project more effectively.

**Increase or decrease in spending compared to the previous year**

In order to analyze the SURF's flexible fiscal management, data from the 2018-2019 period of the Urban Regeneration Headquarters' settlement were used. The amount of change in the budget (general account, special account) and SURF is measured based on the annual expenditure and the rate of increase or decrease in expenditures calculated from it. As an index of flexibility, the absolute value of the rate of change compared to the previous year is used and is calculated by the following.

First, if the expenditure of the individual budget and SURF  $\{i\}$  is defined as  $\{E_{i,t}\}$  in the period  $\{t\}$ , the rate of increase or decrease in expenditure  $\{g_{i,t}\}$  compared to the previous year in each budget and SURF unit can be expressed as follows.

$$g_{i,t} = \frac{(E_{i,t} - E_{i,t-1})}{E_{i,t-1}}$$

And since this study focuses on the magnitude of fluctuation rather than increase and decrease, the absolute value  $\{|g_{i,t}|\}$  was used for the increase and decrease rate, and the absolute value of the increase or decrease was indicated as the rate of change.

**Expenditure increase or decrease compared to the current year plan**

The data used for the analysis of the increase or decrease in expenditure compared to the original plan were from the fund management plan and settlement report of the Urban Regeneration Headquarters from 2018 to 2019. Using the expenditure plan on the fund management plan and the amount of expenditure for settlement for the year, the rate of increase

or decrease in expenditure compared to the original plan is calculated. This expenditure change rate was analyzed for relative fluctuations using absolute values. And also, the magnitude of the absolute change was also analyzed by additionally reviewing the changes in the original plan itself.

## **(2) Analysis of expenditure compared to the previous year**

Table 3-9 shows the increase and decrease in the expenditure of the SURF and budget compared to the previous year for the period 2018-2019. Analyzing this, it is confirmed that the SURF is being operated more flexibly than the budget. In 2019, when overall fiscal size decreased due to the reorganization of the Urban Regeneration Headquarters, expenditures in general and special accounts decreased by -15% and -12%, respectively, compared to the previous year, whereas the SURF increased by 41%. This shows that SURF's operation is autonomous and flexible compared to the budget. The fact that SURF's expenditure has increased while the budget has decreased means that, unlike the budget, SURF is relatively independent of the influences other than the project, such as the overall city fiscal situation and organizational restructuring. Of course, there are differences in absolute scale, but considering that general and special accounts are also the source of the urban regeneration project, these changes are meaningful.

[Table 3-9] Status of expenditure increase or decrease

(In millions of Korean won)

|                  | 2018      | 2019      | Inc/dec rate | Rate of change |
|------------------|-----------|-----------|--------------|----------------|
| General Accounts | 1,278,014 | 1,092,296 | -15%         | 15%            |
| Special Accounts | 468,790   | 411,970   | -12%         | 12%            |
| SURF             | 14,735    | 20,809    | 41%          | 41%            |

\* Source: 2018~2019 fund management plan & written settlement of SURF management

Also, looking at the rate of change alone, it can be confirmed that the amount of change in the SURF is the largest. The reason why the rate of change in general and special accounts is similar is that the procedure required for budget change is the same except for the purpose of use. In other words, it can be evaluated that the general and special accounts are operated rigidly, while the expenditure of the SURF is operated relatively flexibly. This is due to the flexibility of financial management resulting from the difference between the budget change procedure and the fund change procedure.

### (3) Analysis of expenditure against the current year plan

Until now, the flexible operation of the fund has been reviewed through an analysis of the year-on-year increase or decrease in SURF expenditures during the period from 2018 to 2019. Here, this section looks at the flexible operation through analysis of the increase or decrease of expenditure for settlement compared to the current year plan of SURF. The flexible operation of the fund can be seen not only as a change in time series but also as a change in cross-section. This is because the fund management plan can be changed without deliberation by the local



council within the range of 20% of the expenditure for each item so that the amount originally planned can be flexibly changed and spent during the project implementation process.

Table 3-10 shows the change in the rate of increase or decrease in spending compared to SURF's plan for the period 2018-2019.

[Table 3-10] Status of increase or decrease in spending compared to the plan

(In millions of Korean won)

|                  | 2018      |           | 2019      |           | 2018       | 2019       | Inc/dec rate | Rate of change |
|------------------|-----------|-----------|-----------|-----------|------------|------------|--------------|----------------|
|                  | Plan      | Expnd     | Plan      | Expnd     | Expnd/Plan | Expnd/Plan | Expnd/Plan   | Expnd/Plan     |
| General Accounts | 1,280,832 | 1,278,014 | 1,095,431 | 1,092,296 | 100%       | 100%       | 0%           | 0%             |
| Special Accounts | 642,021   | 468,790   | 634,490   | 411,970   | 73%        | 65%        | -11%         | 11%            |
| SURF             | 33,897    | 14,735    | 37,672    | 20,809    | 43%        | 55%        | 27%          | 27%            |

\* Source: 2018~2019 fund management plan & written settlement of SURF management

As can be seen in Table 3-10, for SURF, the ratio of expenditure to plan was 43% and 55% in 2018 and 2019, respectively. On the other hand, the ratio was higher for both special accounts and general accounts. The reason why special accounts and SURF expenditure rates are lower than that of general accounts is due to the type and nature of the sub-projects that constitute them. In other words, even if general accounts, special accounts, and SURF all support urban regeneration projects, there may be differences in the volatility of expenditure plans. Take the urban regeneration project in Sin-chon as an example. General accounts support sub-projects such as subsidies for the operation of a residents' committee and public relations. On the other hand, both Special Accounts and SURF support sub-projects such as land compensation and

construction. Therefore, the rate of change in the expenditure plan of the general account, which is in charge of the sub-project where most of the predictable and daily expenditure is, was high. However, the rate of change in the expenditure plan of SURF and Special Account, which is in charge of sub-projects with severe expenditure fluctuations depending on the process, was low. Meanwhile, although the special account and the SURF both support similar target projects, the low expense ratio of the SURF is due to the flexibility of operation. That is, in the case of the budget (general account, special account), all parts that were not used in the current year are returned except for the amount carried over to the next year and used as common resources for the next year. Whereas, the fund is still accumulated as surplus assets in the fund.

This characteristic is also confirmed in changes of expenditure plans within the same fiscal year. Table 3-11 shows the status of SURF's original expenditure plan and changed expenditure plan by year.

[Table 3-11] Changes in spending plan of the SURF

(In millions of Korean won)

|                  | 2018         |           | 2019         |           | 2018         | 2019         | Avg Inc/dec rate | Avg Rate of Change |
|------------------|--------------|-----------|--------------|-----------|--------------|--------------|------------------|--------------------|
|                  | Initial Plan | Mod Plan  | Initial Plan | Mod Plan  | Inc/dec rate | Inc/dec rate |                  |                    |
| General Accounts | 1,280,832    | 1,280,832 | 1,095,431    | 1,095,431 | 0%           | 0%           | 0%               | 0%                 |
| Special Accounts | 642,021      | 642,021   | 634,490      | 634,490   | 0%           | 0%           | 0%               | 0%                 |
| SURF             | 33,897       | 33,897    | 37,672       | 42,808    | 0%           | 14%          | 7%               | 7%                 |

\* Source: 2018~2019 fund management plan of SURF management

As shown in Table 3-11, there was no change in the total expenditure plan within the same fiscal year for general and special accounts. On the other hand, in the case of SURF, in 2019, the plan was changed by a 7% increase compared to the original plan. This is because, in the case of budget, there was no case of adding major items or changing budget between major items which causes an increase of the total size of the budget unless a supplementary budget was organized. In other words, although there is a system called 'Transferred Use' under the Local Finance Act, there has been no case of using the system in Seoul within the last 10 years. The reason for this is due to the cumbersome procedure and the administrative control over the plan change such as the criticism of not properly grasping the budget demand from the local council.

However, as discussed above, urban regeneration projects have characteristics of many incentives to change plans. Therefore, SURF was newly established to overcome the limitations of the current budget system that did not reflect these characteristics. As a result, similar to time series analysis, SURF is operated more flexibly than general and special accounts in cross-sectional analysis.

#### **(4) Sub-conclusion**

As a result of analyzing the flexible fiscal management through SURF's 2108~2019 operation status, SURF is operating both diachronically and synchronically compared to the budget (general account, special account). Specifically, in the case of expenditure fluctuations compared to the previous year, the change in SURF was higher than in general or special accounts, indicating high flexibility in terms of time series. Meanwhile, as a result of a cross-sectional analysis of changes in the plan for the current year, it was also found that SURF is operating flexibly within the same fiscal year compared to general or special accounts. In particular, SURF had higher flexibility compared to special accounts with the same target

project. In conclusion, it can be evaluated that SURF satisfies its original purpose of the flexible fiscal operation.

However, it has not been long since the SURF was newly established, and the 2020 settlement procedure is still in progress, so only data for the two years from 2018 to 2019 could be analyzed. In this respect, this analysis has its limitations. Therefore, it is necessary to expand the scope of analysis by regularly and long-term analysis of data obtained through SURF operation in the future.

#### **IV. SURF Utilization Plan**

We have looked into the operation status of SURF so far by dividing it into income and expenditure. As a result, in terms of revenue, the implications were drawn that diversification of financial resources and active use of surplus funds are required for SURF. In addition, in terms of expenditure, it was also confirmed that SURF is operating efficiently. However, the fact that SURF is financially efficient does not necessarily mean that it is effectively supporting urban regeneration projects. Therefore, in this chapter, the validity of SURF's stock investment plan will be analyzed in relation to the active use of surplus funds. In addition, in relation to the diversification of financial resources and effective project support of SURF, the new utilization model is examined in connection with governance.

##### **1. Utilization of surplus assets**

Stability and profitability are two hares for investors hard to chase at once. Because profit is basically a reward given to those who take risks at the expense of safety. Because of this, many investors are interested in return on investment. But if the investor is a public institution, not an individual or a private company, the problem is different. This is because safety is more

important than profitability due to the characteristics of public institutions, which are mostly financed by taxes. This is also the case for the operation of SURF. As discussed above, the city of Seoul is depositing all SURF's surplus assets in banks for the stable operation of public funds.

However, the Urban Regeneration Headquarters is considering investing surplus assets from the perspective of diversifying and expanding the fund's resources. In fact, in 2015, when SURF was in the debate stage before the establishment, several specialized agencies had submitted a plan for managing surplus assets. Among them, the most stable and highly profitable proposal has gone up to the final selection stage. The proposal targeted stocks, bonds, and real estate. In the case of equity investment, the plan considers the only one factor, the U.S. stock price. It adopted an equation about the prediction of the stock price of Korea using the U.S. stock price index as an independent variable. Indeed, many private equity investment firms have shown a high return through the U.S. stock market analysis until then.

However, regardless of the validity of the contents of the proposal, the proposal was discarded without being reviewed as the establishment of the SURF fell through at the time. Since then, SURF was actually established in 2017 and has been operating since 2018, but there are no specific ways to utilize the surplus assets. Therefore, it is now necessary to review the validity of the above proposal as a plan to utilize surplus assets for SURF. The following attempts to empirically analyze whether the U.S. stock price correlates with the Korean stock price, and if they are correlated, examine the correlations by period and draw implications for the management of SURF's surplus assets.

In addition to the U.S. stock prices, there are many factors that affect Korea's stock prices, including interest rates, exchange rates, currency volume, and level of prices. However, this report will focus on the U.S. stock prices since Seoul is considering them as the most

influential factor. For this reason, this research is meaningful in that it targets the U.S. and Korean stock prices in relation to local governments' fund management, unlike previous studies focusing on the coupling phenomenon of the rate of return among developed countries' stock markets.

This report uses S&P500 (Standard & Poor's 500 Stock Index) and DJIA (Dow-Jones Industrial Average) as data on the U.S. stock prices and KOSPI as Korean stock prices. In Korea, the KOSPI is announced for 200 companies that have a strong influence on the stock market by the Korea Stock Exchange. In the U.S., there are various stock price indices depending on the research institute and the companies involved, but this paper selected the most frequently used S&P500 and DJIA in the stock market analysis. The S&P500 is targeted at 500 companies and DJIA is targeted at 30 companies. Each index used daily data from January 2010 to September 2019, and dates without disclosure were excluded from the data due to differences in opening dates. Based on these data, this report will examine whether the US stock price can be an indicator of Korea's stock price. And through this, it will be reviewed whether the proposal for investing in SURF's surplus assets using the Korea-US stock price co-movement is valid.

This section consists of five parts. The previous research part examines the results of previous studies on stock price coordination between Korea and the United States. The next part illustrates the definition and cause of stock price co-movement and the hypotheses to be tested in this paper, and then, the variables and analytical models used in this study. At the end of this part, the results of correlation and regression analysis between the Korean and the US stock prices are analyzed. The sub-conclusion part draws the implications of the research results and discusses the limitations and future tasks of this study.

### 1) Previous Research

Korea's research on stock price synchronization began in earnest in the 2000s after the currency crisis. In particular, there have been many studies on the correlation between the US stock market and the Korean stock market.

Jicheong, Cho Dam, Yang Chae-Yeol(Ji et al., 2001) studied the effect of US stock prices on Korean stock price fluctuations. They empirically analyzed whether daily stock price fluctuations in Korea responded effectively to US stock price fluctuations. The paper uses the daily yield data of KOSPI and S & P500 from January 1992 to June 2000, and compares the daily yield of KOSPI against the previous day's closing price and the day's market price, the study classified daytime returns. As a result, the KOSPI daily yield showed a harmonious response to the S & P 500 daily yield after the financial crisis, and also the daytime yield as well as the KOSPI night yield.

Cho Dam, Richard, and Bauer (Cho Dam et al., 2002) empirically analyzed the stock price response of Asian emerging markets in six countries including Korea, Taiwan, Hong Kong, Singapore, Thailand, and Malaysia. Strong daily co-movement was found in five countries except Taiwan, using daily yield data from each country's representative stock index, including the S & P 500 and the KOSPI. This has shown that the effect has generally been from the US stock market to emerging Asian markets.

Jeon Sang-kyung and Jong-yeon Choi (Jun & Choi, 2003) analyzed time-variable correlations between the exchange index and the non-exchange index in Korea and the United States in order to analyze investment behavior by investor, focusing on US-Korea stock price co-movement. They correlated the results of the analysis with investment behavior by investor. As a result, there is a synchronization phenomenon between the exchange market in Korea and the

United States, and a synchronization phenomenon between the non-exchange market. In addition, as a result of investigating the stock price co-movement between the US and Korea in relation to investment behaviors by foreign investors, foreign investors showed the closest investment behavior with stock price synchronization.

Oh Byung-cheol, Park Sang-ae (Oh & Pakr, 2009) analyzed the KOSPI, the representative domestic stock index, and the representative stock indexes of the US, China, and Japan, which are considered to be highly correlated with the domestic stock market. He verified interdependence between the S & P 500 in the US, the SCI in China, and the NIKKEI index in Japan in the full period, the first half, and the latter. As a result, the domestic stock market was correlated with the US, China and Japan stock markets over the entire period. However, as a result of the comparison between the first half and the latter of the period, after the financial crisis there was decoupling with the US and Japan, while there was coupling with the Chinese market.

Many of the previous studies have focused on the US-Korea stock price synchronization, focusing on the 1997 financial crisis, and as a result, during the crisis, found that the stock price coordination between the US and Korea's stock markets became stronger. Unlike previous studies, this study differs from previous studies in that it has empirically analyzed the co-movement of representative stock indices in the US and Korea over the recent decade. In particular, it is significant that the phenomenon can be analyzed in more detail by analyzing the synchronization phenomenon by dividing the entire period and the entire period into two-year units.



## 2) Stock Price Co-movement and Framework

The stock price co-movement refers to a phenomenon in which two or more countries' share prices rise and fall together. This phenomenon is called co-movement or coupling. Co-movement occurs because one country's stock index flows create interdependence, in which other countries are affected by economic factors. Representatively, the United States is one of the countries that is experiencing co-movement. As the US is a global financial market, as the US stock market moves, so do stock markets in other countries. A prime example is the US subprime mortgage crisis. As the incident occurred, liquidity in the financial market was severely reduced, financial companies and investors who invested abroad focused their efforts on recovering principals, and countries even with healthy working conditions were faced with the crisis. In the aftermath, the world will face a financial crisis. When high-income countries begin to slump, low-income countries cannot avoid it. In other words, if the share price of a high-income country falls, so will the share price of a low-income country. As the economy of high-income countries changes, low-income countries move together.

There are three main reasons for the share price coupling. The first is the dependence of foreign economy. Stock price co-movement begins with the dependence of foreign economies. For example, in the case of Korea and the US, Korea's finance and trade are deeply related to the US. Factors related to the overall economy, such as interest rate fluctuations and earnings releases, may differ in information about the US economy, but their movement will affect Korean stock prices. The second reason is the opening of financial markets. The opening of financial markets makes domestic investors more susceptible to changes in the US stock market, resulting in a higher correlation between Korea and the US stock market. In other words, if a domestic investor invests in US stocks and a US investor invests in Korea, the method and

pattern of trading will be similar. This makes Korean stock movement the same as US stock movement. As a result, there is a high possibility of synchronization in the two countries' stock price. Third is market contagion. Market contagion is a phenomenon in which price fluctuations in one market are economically linked by price fluctuations in another market and are affected to a certain level. It is a kind of psychological phenomenon. For example, as in the case of the US subprime mortgage case, if the US stock price falls, other countries' stock prices fall. Investors buy and sell stocks based on information flowing through the market. If trading is caused by information related to speculation or abnormal trading, it can happen simultaneously worldwide. In other words, the price movement determined by the information and animal sense of a market is transmitted between countries (E. Kim, 2016).

As mentioned above, the results of previous studies showing that US stocks are in sync with Korean stocks show that there is a strong positive correlation between them, and there is a clear causal relationship between them. This study attempts to verify whether such synchronism is still significantly maintained in the past decade using stock indices of both countries.

**H0:** There is co-movement between the US and the Korean stock prices.

**H1:** There is not co-movement between the US and the Korean stock prices.

To this end, this study first examines the relationship between three variables through Pearson correlation analysis between three stock indexes and then performs multiple regression analyses on KOSPI200 with S & P500 and DJIA as independent variables. The regression analysis is divided into two years to improve the accuracy of the analysis.

### 3) Data and Methodology

#### (1) Independent variable

**S & P500(Standard & Poor's 500 Stock Index):** A stock index created and published by Standard & Poor of the United States, and published for 500 common stocks selected based on the size, liquidity, and industry representation of the company. The most commonly used indices in the United States include industrial stocks (400 stocks), transportation stocks (20 stocks), public stocks (40 stocks), and financial stocks (40 stocks). In addition to the Nasdaq and Dow indexes, the index is one of New York's three largest indices. Table 4-1 shows the summary of the S & P500, and the data used is the daily index from January 2010 to September 2019 provided by the St. Louis Federal Reserve Bank's homepage 'economic research'. Dates without disclosure were excluded from the data due to differences in opening dates.

[Table 4-1] Summary Information (S & P500)

| Variable | Obs   | Mean     | Std. Dev. | Min     | Max     |
|----------|-------|----------|-----------|---------|---------|
| SP500    | 2,322 | 1925.919 | 565.2037  | 1022.58 | 3025.86 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

**DJIA(Dow-Jones Industrial Average):** Charles Dow, who founded Dow Jones in 1882, began publishing a stock price average on July 3, 1884, which is the foundation of the Dow Jones Index. The Dow is a stock index that averages market prices based on a sample of the 30 most trusted and stable stocks in the US. DJIA points out that the index may be distorted because it is calculated on the average of stock prices rather than market capitalization, but it is regarded

as a representative stock index that shows trends and prices in the US stock market. Table 4-2 summarizes the DJIA's summary information. The data used was the daily index from January 2010 to September 2019 provided by the St. Louis Federal Reserve Bank's homepage 'economic research'. Dates without disclosure were excluded from the data due to differences in opening dates.

[Table 4-2] Summary Information (DJIA)

| Variable | Obs   | Mean     | Std. Dev. | Min     | Max     |
|----------|-------|----------|-----------|---------|---------|
| SP500    | 2,322 | 1925.919 | 565.2037  | 1022.58 | 3025.86 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

## (2) Dependent variable

**KOSPI 200(Korea Composite Stock Price Index 200):** The KOSPI 200 Index represents the market cap of 200 stocks selected based on the market's representativeness and liquidity. The index is calculated by comparing the listed market cap of 200 stocks on January 3, 1990, and comparing the listed market caps of 200 stocks. In order to calculate the KOSPI 200, we first select 200 stocks, starting with the largest market capitalization among the total 900 stocks. The market capitalization of the selected 200 stocks is equivalent to 70% of the market cap. As a result, it is evaluated as a representative index indicating the stock price of Korea. Table 4-3 shows the summary information of KOSPI200, and the data uses the daily index from January 2010 to September 2019 provided by the Korea Stock Exchange. Dates without disclosure were excluded from the data due to differences in opening dates.

[Table 4-3] Summary Information (KOSPI200)

| Variable | Obs   | Mean     | Std. Dev. | Min     | Max     |
|----------|-------|----------|-----------|---------|---------|
| KOSPI200 | 2,322 | 2032.804 | 194.5241  | 1552.79 | 2598.19 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

### (3) Methodology

To establish a regression model between independent and dependent variables, Pearson's correlation analysis on three variables first is carried out. If the correlation between the three variables is confirmed through Pearson's correlation analysis, we will analyze the predictive power of Korean stocks using the US stock index. In this section, we perform multiple regression analysis on KOSPI200 with S & P500 and DJIA as independent variables.

$$Y = a + b_1X_1 + b_2X_2$$

Y = Korea Composite Stock Price Index

A = intercept

B1 = regression coefficient of X1

X1 = Standard & Poor 's 500 Stock Index

B2 = regression coefficient of X2

X2 = Dow-Jones Industrial Average

#### 4) Results and Findings

To establish a regression model between independent and dependent variables, the correlation between three variables firstly analyzed. Table 4-4 shows that there is a statistically significant strong positive correlation between S & P500 and KOSPI200, DJIA and KOSPI200, and a very strong positive correlation between S & P500 and DJIA. This shows that US and Korean stocks are in synchronization when the entire research period is covered. The S & P 500 and DJIA, on the other hand, show that they reflect the trends and prices of the US stock market well despite the fact that the companies that make up each index differ.

[Table 4-4] Correlation Matrix

|          | KOSPI200          | SP500             | DJIA   |
|----------|-------------------|-------------------|--------|
| KOSPI200 | 1.0000            |                   |        |
| SP500    | 0.7304*<br>0.0000 | 1.0000            |        |
| DJIA     | 0.7461*<br>0.0000 | 0.9928*<br>0.0000 | 1.0000 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

Regression analysis results show that the S & P 500 and DJIA combined explain 56% of the variance in KOSPI200 (Adj R-squared: 0.5637). If the DJIA is constant, an increase of 1 point in the S & P 500 will cause a 0.25-point drop in the KOSPI 500. With the same logic, if the

S & P 500 is constant, a DJIA point increase would increase the KOSPI200 by 0.06 points.

However, as shown in Table 4-5, the regression coefficient has a negative value unlike the Pearson correlation result that the S & P500 has a strong positive correlation (Coef: -0.246). For a more accurate analysis, the regression analysis was conducted by dividing the entire period into two years.

[Table 4-5] Regression Analysis Results (2010 ~ 2019)

|          |            |       |            |               |   |         |
|----------|------------|-------|------------|---------------|---|---------|
| Source   | SS         | df    | MS         | Number of obs | = | 2,322   |
| Model    | 49536983.4 | 2     | 24768491.7 | F(2, 2319)    | = | 1500.13 |
| Residual | 38288777.2 | 2,319 | 16510.9    | Prob > F      | = | 0.0000  |
| Total    | 87825760.6 | 2,321 | 37839.6211 | R-squared     | = | 0.5640  |
|          |            |       |            | Adj R-squared | = | 0.5637  |
|          |            |       |            | Root MSE      | = | 128.49  |

| KOSPI200 | Coef.     | Std. Err. | t      | P> t  | [95% Conf. Interval] |          |
|----------|-----------|-----------|--------|-------|----------------------|----------|
| SP500    | -.2466612 | .0393384  | -6.27  | 0.000 | -.3238034            | -.169519 |
| DJIA     | .0575634  | .0045139  | 12.75  | 0.000 | .0487116             | .0664152 |
| _cons    | 1513.121  | 9.873249  | 153.25 | 0.000 | 1493.76              | 1532.482 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

The results of the regression analysis based on the data from 2010 to 2011 are shown in Table 4-6. At this time, both the S & P 500 and the DJIA had positive regression coefficients for the KOSPI 200, as shown by Pearson's correlation analysis. The adjusted R-squared value also increased over the period, indicating higher explanatory power. However, DJIA did not show statistically significant results due to the large P-value.

[Table 4-6] Regression Analysis Results (2010 ~ 2011)

| Source   | SS         | df  | MS         | Number of obs | = | 484    |
|----------|------------|-----|------------|---------------|---|--------|
| Model    | 11029710.7 | 2   | 5514855.33 | F(2, 481)     | = | 867.15 |
| Residual | 3059022.9  | 481 | 6359.71497 | Prob > F      | = | 0.0000 |
|          |            |     |            | R-squared     | = | 0.7829 |
|          |            |     |            | Adj R-squared | = | 0.7820 |
| Total    | 14088733.6 | 483 | 29169.2206 | Root MSE      | = | 79.748 |

| KOSPI200 | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |           |
|----------|-----------|-----------|-------|-------|----------------------|-----------|
| SP500    | 1.420106  | .2047673  | 6.94  | 0.000 | 1.017757             | 1.822455  |
| DJIA     | .0346872  | .0222715  | 1.56  | 0.120 | -.0090742            | .0784486  |
| _cons    | -228.6319 | 51.3366   | -4.45 | 0.000 | -329.5036            | -127.7602 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

In contrast, from 2012 to 2013, DJIA has a negative effect on the KOSPI200, unlike the overall period and the previous two years. In addition, the adjusted R-squared value in Table 4-7 was also significantly reduced, indicating that the explanatory power of the independent variable itself was inferior.

[Table 4-7] Regression Analysis Results (2012 ~ 2013)

| Source   | SS         | df  | MS         | Number of obs | = | 479    |
|----------|------------|-----|------------|---------------|---|--------|
| Model    | 306285.786 | 2   | 153142.893 | F(2, 476)     | = | 41.86  |
| Residual | 1741387.89 | 476 | 3658.37792 | Prob > F      | = | 0.0000 |
|          |            |     |            | R-squared     | = | 0.1496 |
|          |            |     |            | Adj R-squared | = | 0.1460 |
| Total    | 2047673.68 | 478 | 4283.83614 | Root MSE      | = | 60.485 |

| KOSPI200 | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |           |
|----------|-----------|-----------|-------|-------|----------------------|-----------|
| SP500    | .8159342  | .1360331  | 6.00  | 0.000 | .5486345             | 1.083234  |
| DJIA     | -.0901837 | .0179347  | -5.03 | 0.000 | -.1254247            | -.0549427 |
| _cons    | 1973.838  | 54.45418  | 36.25 | 0.000 | 1866.838             | 2080.839  |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019



Regression analysis based on 2014-2015 data (Table 4-8) shows positive regression coefficients for the KOSPI200 for both the S & P500 and DJIA. However, both variables were not statistically significant due to the high P-value (S & P500: 0.081, DJIA: 0.086). In addition, the adjusted R-squared value was small (0.2382), indicating that the explanatory power of the variables was low.

[Table 4-8] Regression Analysis Results (2014 ~ 2015)

|          |            |     |            |               |   |        |
|----------|------------|-----|------------|---------------|---|--------|
| Source   | SS         | df  | MS         | Number of obs | = | 480    |
| Model    | 413501.56  | 2   | 206750.78  | F(2, 477)     | = | 75.90  |
| Residual | 1299427.97 | 477 | 2724.16765 | Prob > F      | = | 0.0000 |
| Total    | 1712929.53 | 479 | 3576.05329 | R-squared     | = | 0.2414 |
|          |            |     |            | Adj R-squared | = | 0.2382 |
|          |            |     |            | Root MSE      | = | 52.194 |

| KOSPI200 | Coef.    | Std. Err. | t     | P> t  | [95% Conf. Interval] |          |
|----------|----------|-----------|-------|-------|----------------------|----------|
| SP500    | .15906   | .0910474  | 1.75  | 0.081 | -.0198436            | .3379636 |
| DJIA     | .0215581 | .0125385  | 1.72  | 0.086 | -.0030794            | .0461956 |
| _cons    | 1308.934 | 65.14941  | 20.09 | 0.000 | 1180.918             | 1436.949 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

The period from 2016 to 2017 is similar to that from 2010 to 2011. Table 4-9 shows that both the S & P500 and the DJIA have a positive relationship to the KOSPI200, and the adjusted R-squared value also increases significantly, indicating a high explanatory power of the variables. In addition, unlike 2010-2011, both variables show statistically significant results due to small P values (S & P500: 0.000, DJIA: 0.011).

[Table 4-9] Regression Analysis Results (2016 ~ 2017)

| Source   | SS         | df  | MS         | Number of obs | = | 473     |
|----------|------------|-----|------------|---------------|---|---------|
| Model    | 16673973.7 | 2   | 8336986.85 | F(2, 470)     | = | 1751.16 |
| Residual | 2237590.96 | 470 | 4760.83183 | Prob > F      | = | 0.0000  |
|          |            |     |            | R-squared     | = | 0.8817  |
|          |            |     |            | Adj R-squared | = | 0.8812  |
| Total    | 18911564.7 | 472 | 40066.8743 | Root MSE      | = | 68.999  |

| KOSPI200 | Coef.    | Std. Err. | t    | P> t  | [95% Conf. Interval] |          |
|----------|----------|-----------|------|-------|----------------------|----------|
| SP500    | .5356314 | .150342   | 3.56 | 0.000 | .2402057             | .8310571 |
| DJIA     | .0353436 | .0138584  | 2.55 | 0.011 | .0081116             | .0625757 |
| _cons    | 232.086  | 73.84105  | 3.14 | 0.002 | 86.98655             | 377.1854 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

The regression analysis results for the 2018 to 2019 period differed significantly from the previous periods. Table 4-10 shows that both the S & P500 and DJIA variables have negative regression coefficients for the KOSPI200. In addition, both variables did not show statistically significant results due to large P values.

[Table 4-10] Regression Analysis Results (2018 ~ 2019)

| Source   | SS         | df  | MS         | Number of obs | = | 406    |
|----------|------------|-----|------------|---------------|---|--------|
| Model    | 753338.937 | 2   | 376669.469 | F(2, 403)     | = | 13.72  |
| Residual | 11066041.2 | 403 | 27459.1594 | Prob > F      | = | 0.0000 |
|          |            |     |            | R-squared     | = | 0.0637 |
|          |            |     |            | Adj R-squared | = | 0.0591 |
| Total    | 11819380.2 | 405 | 29183.6548 | Root MSE      | = | 165.71 |

| KOSPI200 | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |          |
|----------|-----------|-----------|-------|-------|----------------------|----------|
| SP500    | -.0418231 | .2372715  | -0.18 | 0.860 | -.5082676            | .4246214 |
| DJIA     | -.0397674 | .0297885  | -1.33 | 0.183 | -.0983277            | .0187929 |
| _cons    | 3359.747  | 226.7234  | 14.82 | 0.000 | 2914.038             | 3805.455 |

\* Source: Computed by Software for Statistics and Data Science using data from 2010 to 2019

As a result, the results of the regression analysis over the entire period seems to fail to reject the null hypothesis that the US and Korea stock prices are synchronized. On closer examination, however, it is difficult to draw conclusions that simply reject or fail to reject the null hypothesis. This is because the analysis results show various results depending on the investigation period.

### **5) Sub-conclusion**

Understanding the relationship between financial markets, which has become closer and more complex with the development of ICTs, has become the basis for understanding global financial markets. This study examined the stock price co-movement between the US and Korea in the global financial market, where the inter-country stock market interconnected. In particular, unlike previous studies in Korea, where the stock price synchronization focused on the yield or the stock market, this study analyzed the stock price co-movement between the US and Korea based on the representative stock indices of both countries. In addition, this study performed multiple regression analysis on the impact on Korea's KOSPI200 using S & P500 and DJIA, the leading stock indices in the United States. After conducting the Pearson correlation analysis using the entire period as the study period, the stock price co-movement was studied by dividing the data of the past 10 years into units of two years. According to the result of Pearson's correlation analysis, contrary to the general perception that the two countries' stock price co-movement would be clearly visible, the rise of the US S & P 500 over the entire period shows that Korea's stock index has fallen. To examine this in more detail, the period was analyzed by dividing the entire period into two-year units (see Table 4-11). However, as shown in Table 4-11, no unified results could be derived from the analysis by period. The S & P 500 and DJIA showed opposite effects depending on the duration of the analysis, and sometimes did not show

statistically significant results. In addition, two-year period analyzes have shown doubts about the validity of independent variable selection. As a result, the analysis results on stock price synchronization differed according to the survey period. Therefore, it is difficult to clearly state the existence of the stock price synchronization between Korea and the United States.

[Table 4-11] Analysis result of dividing the entire period (2010~2019) by 2 years

|               |      | 2010~2011 | 2012~2013 | 2014~2015 | 2016~2017 | 2018~2109 |
|---------------|------|-----------|-----------|-----------|-----------|-----------|
| Adj R-squared |      | 0.78      | 0.15      | 0.24      | 0.88      | 0.06      |
| S&P<br>500    | Coef | 1.42      | 0.82      | 0.16      | 0.54      | -0.04     |
|               | P> H | 0.00      | 0.00      | 0.08      | 0.00      | 0.86      |
| DJIA          | Coef | 0.03      | -0.09     | 0.22      | 0.04      | -0.04     |
|               | P> H | 0.12      | 0.00      | 0.08      | 0.01      | 0.18      |

\* Source: Summarized the computed results using data from 2018 to 2019

The main cause of this study's disparity from many previous studies that there is a stock price synchronization is the development of information and communication. In other words, with the development of information and communication, each country's relations are becoming more complex and more closely developed. As a result, it is no longer possible to explain the relationship between states with a simple causal relationship that one country has a one-sided effect on another. Under these changes, it is natural that difficulties exist in studying the stock price co-movement between the two countries with the belief that the US stock index will have a one-sided effect on Korea's stock index. In addition, sound fundamentals in the Korean economy

may be a cause of weakening of US and Korean stock price co-movement. Korea, which has built a sound economic fundamentals since the 1997 financial crisis, has quickly overcome the aftermath of the 2008 global financial crisis. As a result, Korea's stock price co-movement did not appear to be serious. On the other hand, countries in Eastern Europe, which were under unstable economic fundamentals, suffered severe stock price co-movement during the US financial crisis. This suggests that if other conditions remain constant, the higher the soundness of the economic fundamentals, the less susceptible to the impact of the financial crisis.

This study may not be sufficient to clarify or deny the existence of US-Korea stock price synchronization. However, this study is meaningful because it has questioned the results of previous studies that Korea's stock market shows strong synchronization with the US stock market. In addition, it is also significant that Korean government agencies have analyzed the stock market as an investment destination for investing the extra funds of public institutions as their legal status as a stock investor is recognized. In conclusion, Seoul should not accept a proposal that includes an investment plan for SURF's surplus asset based on stock price coordination between Korea and the United States. Of course, it may be profitable at a time when stock price harmony is apparent, but in other times, it has to lose a lot. All investments involve risks, but the risks must be limited to risks that cannot be avoided. This is especially true for investments that use public funds. Stock price synchronization can confirm its existence based on historical data. As such, we cannot determine future investments based on share price coordination. This is because it is impossible to predict when stock prices will move in the future.

Despite many implications, this study has limitations. First, although the share price was determined in an irregular time period, the co-movement phenomenon was analyzed using the

daily price index data, which assumes that the daily closing prices were formed constantly every 24 hours. For more accurate analysis, more sophisticated verification using intra-day analysis data is required. In addition, recent research on stock price synchronization through volatility analysis has been actively conducted, and the results may be different from this study. In this study, research on U.S. stock prices did not reveal other factors that affect stock price coordination. As the results of the regression analysis of this study did not show consistent results, the conclusions on the stock price co-movement between the two countries could not be clearly stated. In this study, the stock index was used as an independent variable, but if empirical analysis considering interest rates, exchange rates, and prices, a more general analysis result could be obtained. It is also believed that additional information will be obtained if the analysis is refined, including not only the U.S. but also other countries.

## **2. Application of governance**

In the previous section, the efficient use of SURF was reviewed, focusing on the use of surplus assets. In the following, the utilization plan of SURF itself in connection with the urban regeneration project is reviewed. In particular, we will develop a strategy for urban regeneration suitable for Seoul and model the SURF operation plan that can effectively support it. In particular, this report develops an urban regeneration specific strategy suitable for Seoul and designs a model of the SURF operation that can effectively support it. In addition to effectively supporting urban regeneration projects, making good use of SURF itself also contributes to the diversification of financial resources through the use of governance. In this section, so that such strategic planning does not stop at theoretical discussions, a hypothetical case analysis is conducted by selecting one of the actual regions in Seoul where this model can be applied.

### 1) Basic conception

As already discussed in Chapter 3, SURF is designed and operated in a structure that can make the most of the flexibility of the fund. However, the revenue of SURF consists only of the overconcentration charge, so it is necessary to diversify financial resources. And expenditure is also entirely used to support public-led urban regeneration projects, so a paradigm shift should be considered. As a way to solve these two tasks at the same time, this report proposes 'Lifetime Management for Self-reliant Regional Regeneration(LM)'. LM is an urban regeneration strategy specialized in Seoul which has entered an 'aged society' and aims to cultivate independent capacity in the region by revitalizing the local economy through SURF<sup>9</sup>. As a result, the role weight of the public sector is large at the beginning of the urban regeneration project, whereas the role weight of the private sector increases as time passes. In the process, contributions, allotments, etc. are collected from areas that have been economically enriched through urban regeneration projects and used as financial resources for SURF. Then, the collected resources are reinvested in the region to form a virtuous cycle. After all, this has a more positive meaning to manage the lifetime of the city by invigorating the declining city, not just completing the urban regeneration project at a specific point in time.

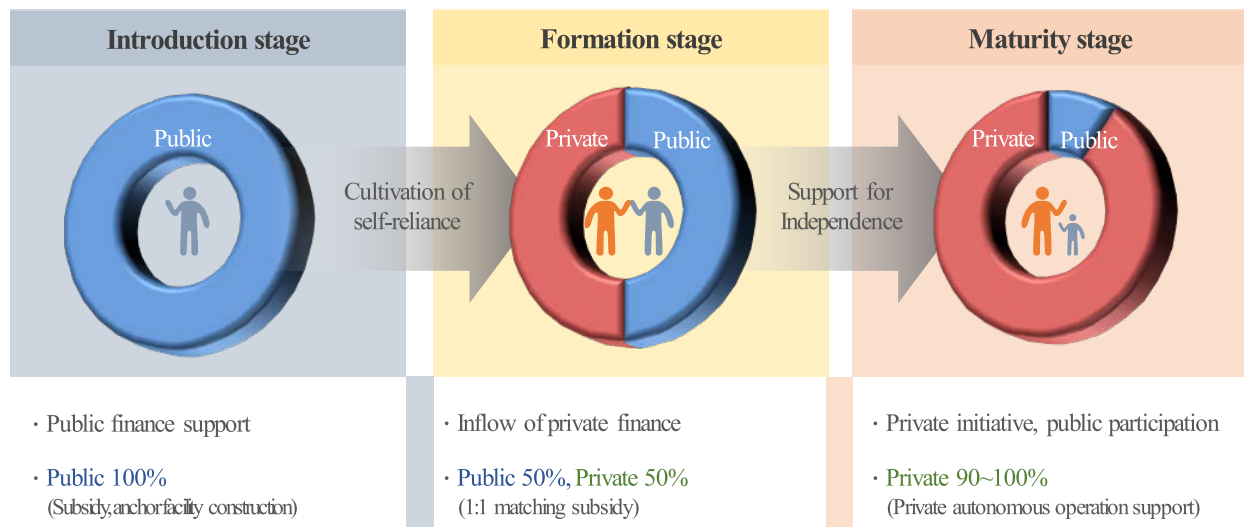
Figure 4-1 shows the step-by-step characteristics of LM. As shown in Figure 4-1, at the early stage of the urban regeneration project, the project is promoted mainly based on public resources. However, when it reaches the maturity stage through the formation stage, it becomes an independent urban regeneration led by the private sector. In the formation stage, unlike the

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<sup>9</sup> In 2018, the total population of Seoul was 10,049,607, of which 1.41 million people aged 65 or older accounted for 14.4% of the total population. The United Nations categorizes the population aged 65 and over as an 'aging society' if it is 7% or more of the total population, as an 'aged society' if it is 14% or more, and as a 'super-aged society' if it is 20% or more (H.-J. Choi, 2015). Seoul first entered the aging society in 2005, followed by the aged society in 2018, and is expected to enter the super-aged society in 2026.

introduction stage, the funding of the project is jointly borne by the private and public. In addition, in the maturity stage when economic revitalization is achieved, most of the financial resources other than some public funds are borne by the private sector.

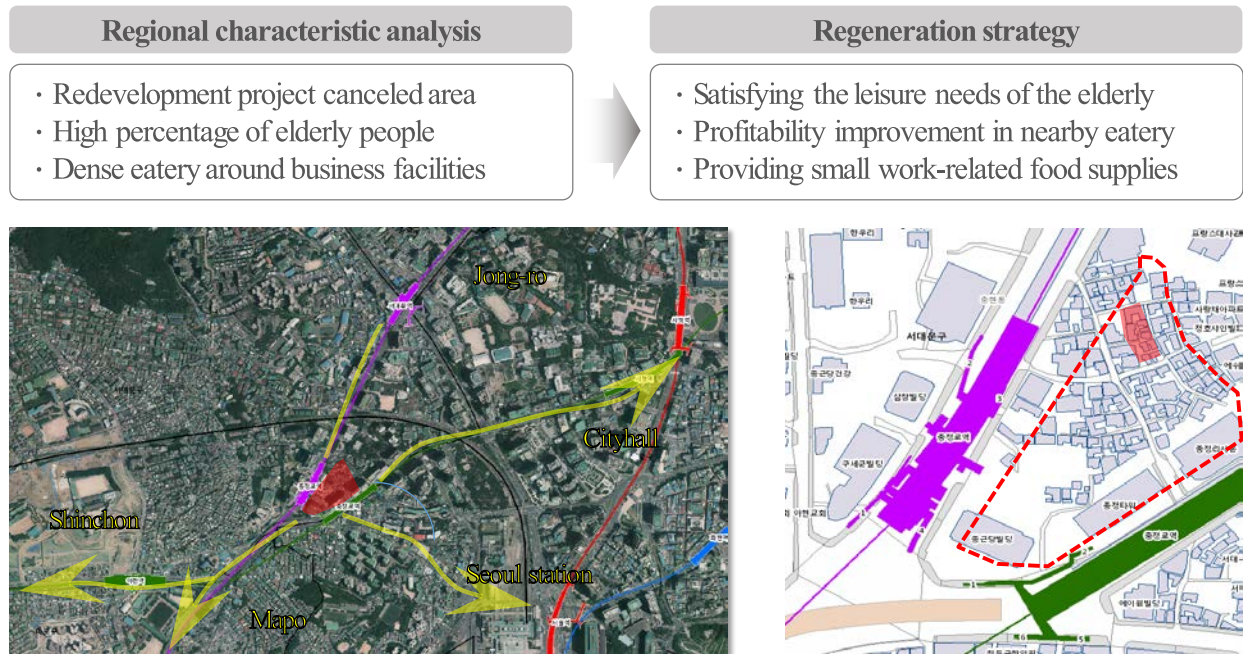
[Figure 4-1] Step-by-step features of LM



The following deals with basic ideas and case analyses of LM models at each stage. As for the case, this model is applied hypothetically and analyzed for the Chungjeong-ro 4-gil area located in Seoul. Figure 4-2 shows the regional characteristics of the Chungjeong-ro 4-gil area and the appropriate urban regeneration strategy. Consisting of major business facilities and some aging residential areas, the area is characterized by a high elderly population and close proximity to nearby restaurants. Therefore, in the following, considering these characteristics, the LM model that develops leisure activities of the elderly population in connection with profitable businesses is hypothetically applied and analyzed.



[Figure 4-2] Target area for case analysis



## 2) Introduction stage

In the introduction stage, SURF's role is to unilaterally support public-led urban regeneration projects (see Figure 4-3). Therefore, SURF is operated with a single regeneration account, and the source of revenue consists only of non-tax income (overconcentration charge) and is mostly spent as subsidies. Of course, some loans can be provided, but there are few cases of use due to the burden of repayment in the future. In addition, supports can be provided through in-kind investment which directly provides anchor facilities. Either way, urban regeneration in the introduction stage takes place in a form led by the public sector.

[Figure 4-3] Model design at the introduction stage

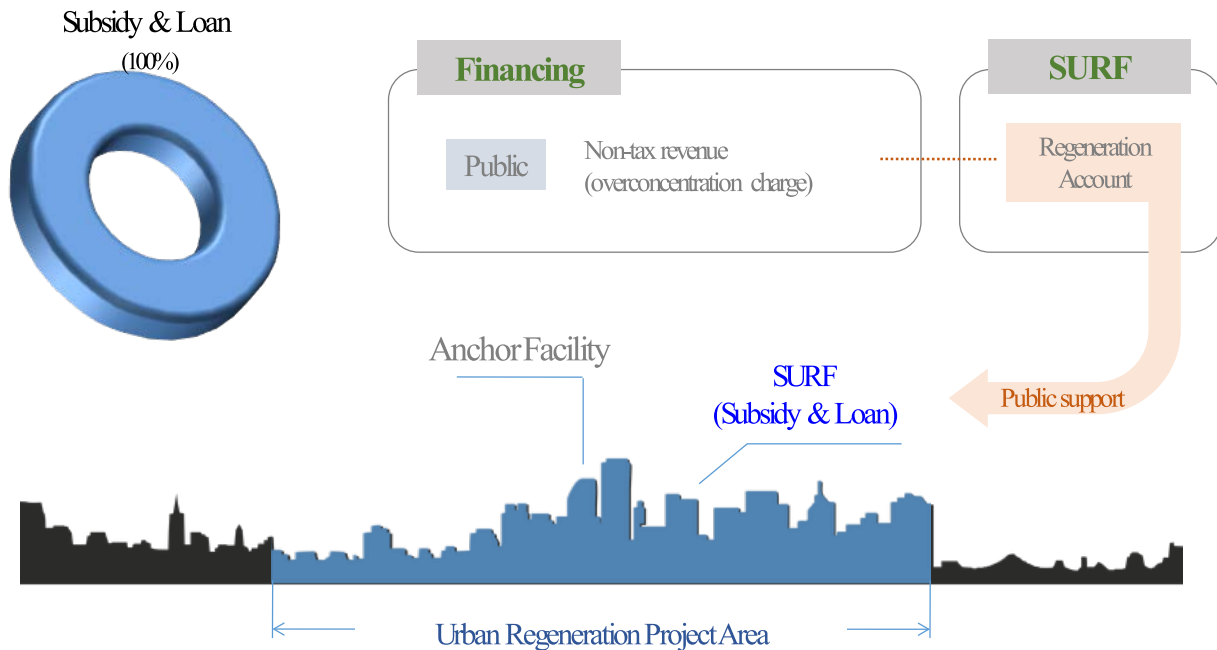
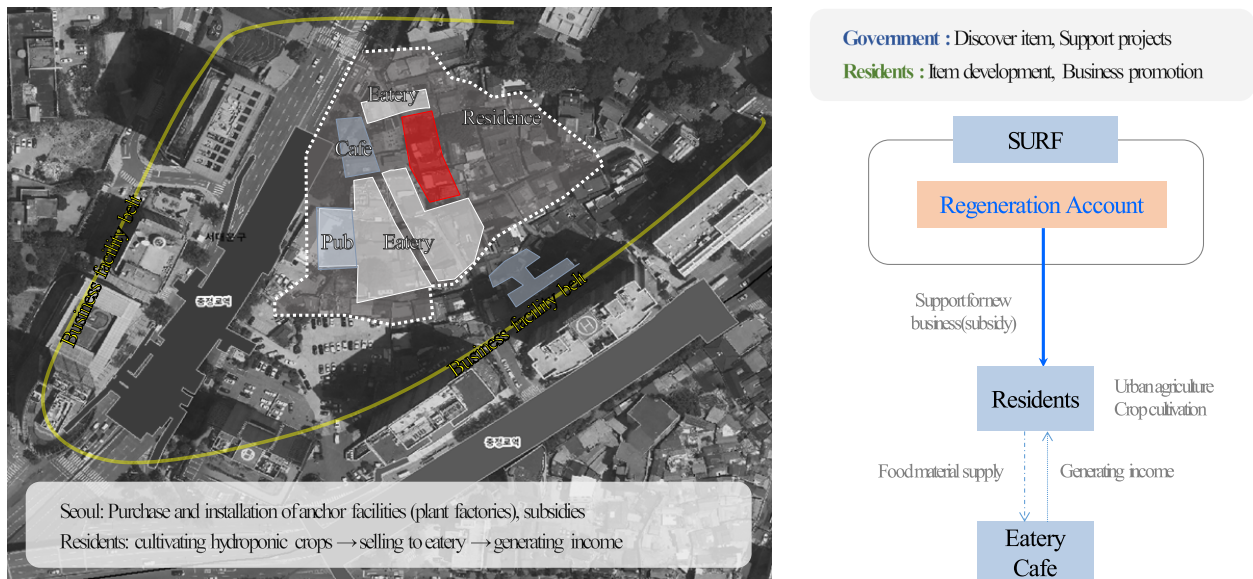


Figure 4-4 shows an example of applying the LM model in the introduction stage to the Chungjeong-ro 4-gil area. Surrounded by major business facilities, the area is crowded with restaurants, often visited by office workers. Accordingly, the city of Seoul will support urban regeneration projects under the theme of urban agriculture in the area, and local residents who receive subsidies will build plant factories using Agtech<sup>10</sup>. Here, elderly residents grow hydroponic crops on a small scale and sell the crops to nearby restaurants. As a result, a structure capable of generating revenue will be established, and the foundation for local income growth and self-sustaining urban regeneration will be laid. However, at this stage, the operating subject of profitable businesses is mostly individual residents who have not yet been organized.

<sup>10</sup> Agtech is a compound word that combines agriculture and technology. Agtech industries include technologies such as biotechnology for agriculture, precision agriculture, alternative foods, and food e-commerce. Recently, it appears in the form of smart urban agriculture using smart technology in connection with smart urban regeneration (Lim, 2017).

[Figure 4-4] Case of Chungjeong-ro 4-gil at the introduction stage



### 3) Formation stage

The formation stage is a period in which the private sector's competency grows in earnest based on the independence gradually cultivated in the introduction stage. In other words, based on the subsidies supported in the introduction stage, the residents' own profit-generating business is activated, and as a result, a structure is formed to return the benefits obtained from the urban regeneration project to the local community (Figure 4-5). There are various ways of returning the benefits, but contributions, allotments, and some part of the business profits are representative examples. The contribution is a concept of ex-post sharing of the financial burden for urban regeneration projects undertaken by the public sector at the beginning of the introduction. The allotment is also a representative means of returning the benefits from urban regeneration projects to the community<sup>11</sup>. However, the difference between contributions and allotments is

<sup>11</sup> This is similar to the Business Improvement District (BID) implemented in the United States, the United Kingdom, and Germany, but the specific ways to operate it differ slightly by country or city (S. Lee & Lee, 2013). To apply BID to this model, the prerequisites will be described later in the sub-conclusion section. Meanwhile, Tax Increment Financing (TIF), which is known as a representative urban development financing tool along with BID, was not reflected in this model. This is because it is difficult to predict changes in asset value in the future due to the

that, unlike allotments, contributions have voluntariness in the amount and payment. Therefore, the allocation criteria for allotment is important. In general, the amount of allotments is calculated by taking into account the average land price increase rate or income increase rate in the region. Business profit is literally returning part of the income generated from profitable projects discovered through urban regeneration projects to the local community. These are all financial resources of SURF.

In this stage, unlike in the introduction stage, SURF is divided into a regeneration account and independent account and operated in a dual system. In particular, the deliberative council on fund management is also operated separately for each account, and local resident representatives participate as members of the independence account council, ensuring the identity of the account. In other words, the regeneration account is still used as a subsidy for urban regeneration projects throughout Seoul, but the independence account is used as a reinvestment resource for the development of the region, which has been borne by contributions and allotments.

The important point here is that in the formation stage, unlike the introduction stage, an organization that will lead the urban regeneration of the local community is formed by the coalition of local residents and local businesses. This organization is responsible for managing profitable businesses in the region, distribution of contributions and business profits, and becomes a partner with local governments.

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nature of Seoul where real estate prices drastically fluctuate in a short period, and if the results of urban regeneration projects are insignificant, the financial burden on the city is increased.

[Figure 4-5] Model design at the formation stage

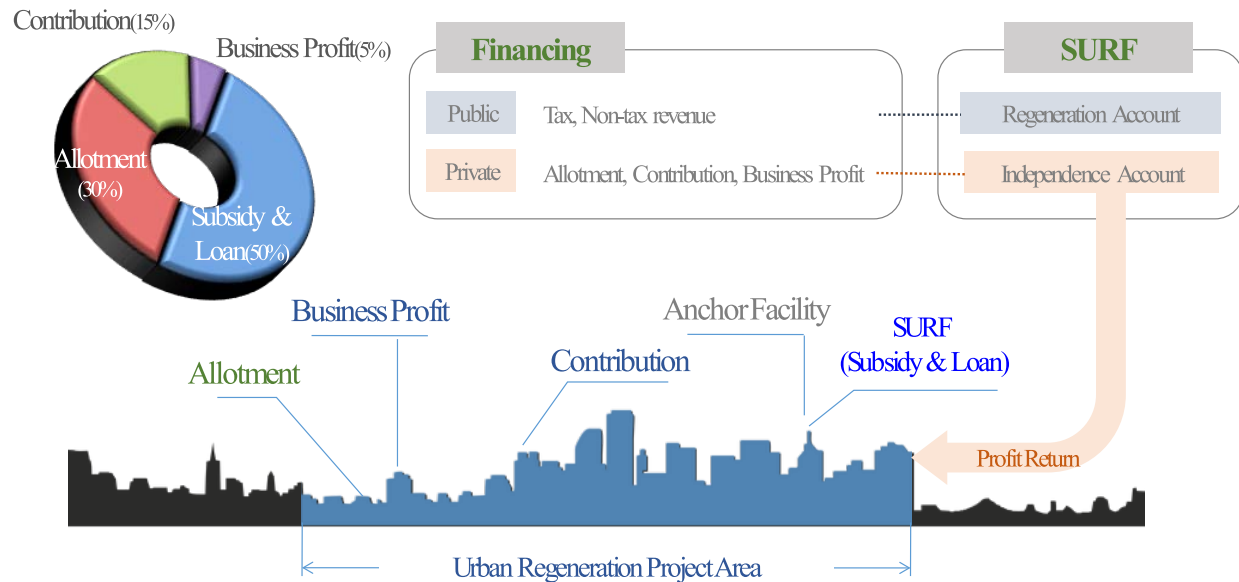
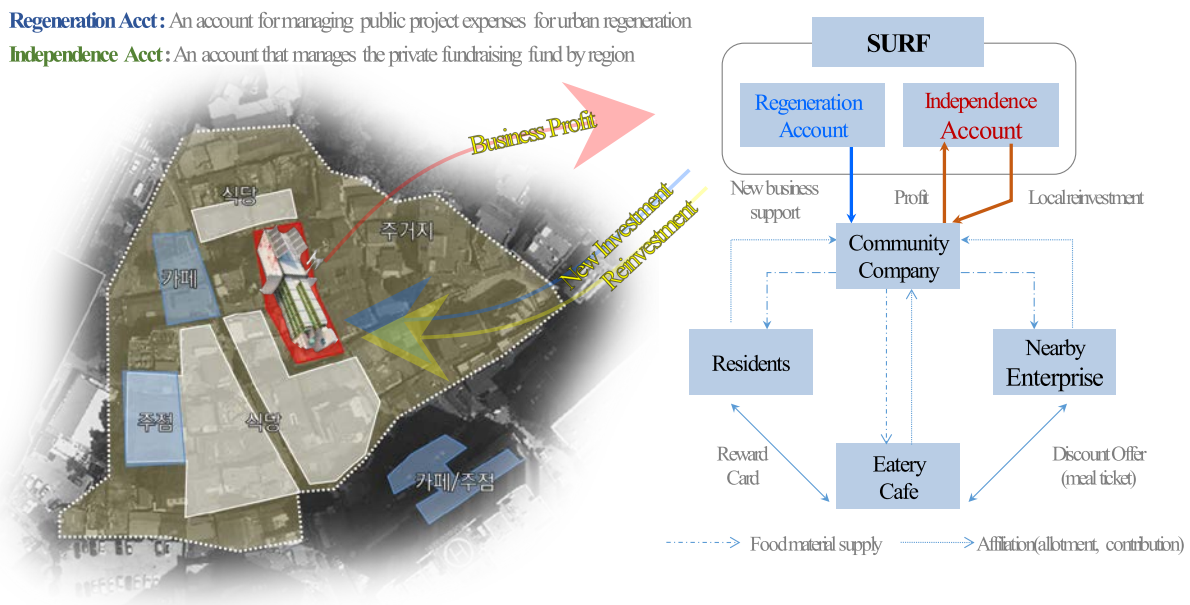


Figure 4-6 shows an application example of the LM model to the formation stage. At this stage, an independent account is created in SURF, and contributions and allotments from the region are managed and operated separately from the regeneration account. In addition, this period is a time when the achievements of urban regeneration projects in local communities are also expanded. In other words, the expansion of urban agriculture, which was a pilot program for profitable business, expands the scale of cultivation of hydroponic crops, and the local economy grows as transactions with nearby restaurants become active. Since there is no distribution process for food materials produced in plant factories, they are able to supply fresh food ingredients promptly and inexpensively to nearby restaurants. This allows neighboring restaurants to provide incentives such as reward programs and discounted meal tickets to local residents and employees of neighboring companies, thereby increasing overall profits.

Meanwhile, at this stage, local residents and neighboring companies are allied and community companies appear, playing a role as the subject of overall urban regeneration. As a result, a cooperative system between the public and private sectors is established, and a virtuous cycle is formed in which contributions, allotments, and business profits from the region are financially reinvested through the SURF's independence account.

[Figure 4-6] Case of Chungjeong-ro 4-gil at the formation stage



#### 4) Maturity stage

The maturity stage is the stage in which the autonomous capacity of the urban regeneration area has been sufficiently cultivated. In other words, local residents and enterprises enjoy their respective business profits by profit-making businesses discovered through urban regeneration projects, and the organization that manages and represents them collectively



develops into legally and economically independent corporations. As a result, urban regeneration at this stage has a different pattern than before. The public sector played a leading role in the introduction stage, and in the formation stage, the public and private sectors cooperated on an equal footing. However, in the maturity stage, the private sector plays a leading role, and the public sector plays a role as a participant who supports only when necessary.

Figure 4-7 shows the model structure in the maturity stage. As shown in the figure, the location of the SURF here is different from the previous step. In other words, if SURF has played a role in supporting and leading the overall project from outside the urban regeneration area, from now on, a separate regional fund operated by the regional regeneration corporation will play the role. Instead, SURF, operated by local governments, forms part of the revenue source of regional funds in the form of investments. Eventually, the urban regeneration model in the maturity stage is settled as a completely independent and self-sustaining entity, out of the area of public control.

[Figure 4-7] Model design at the maturity stage

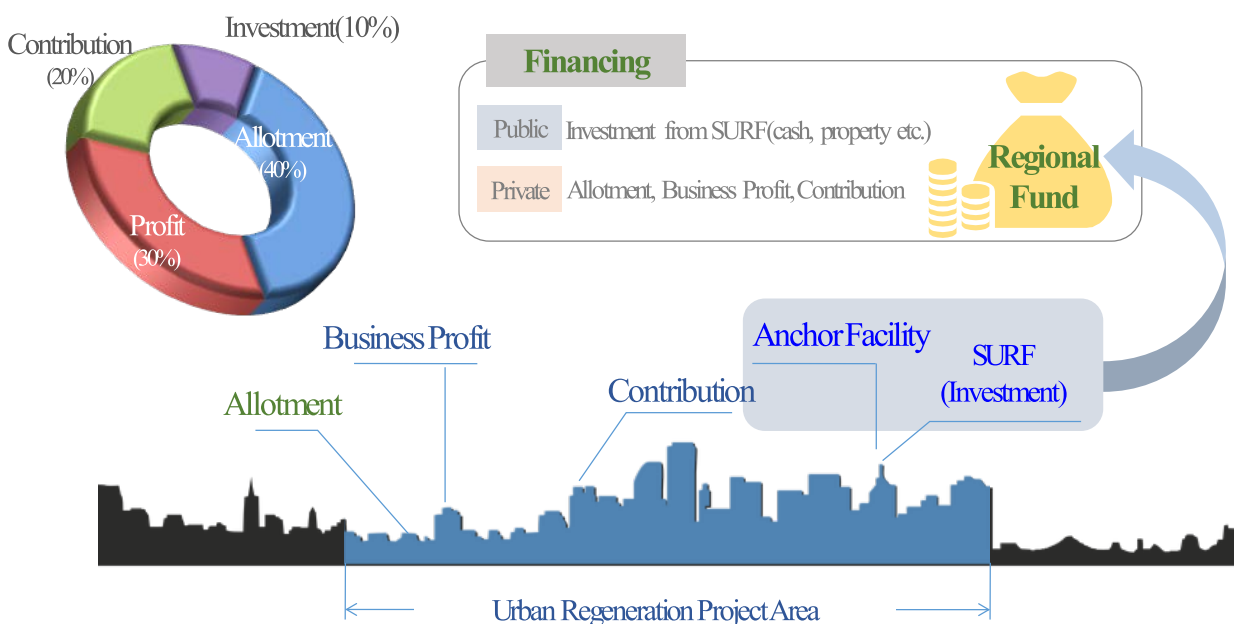
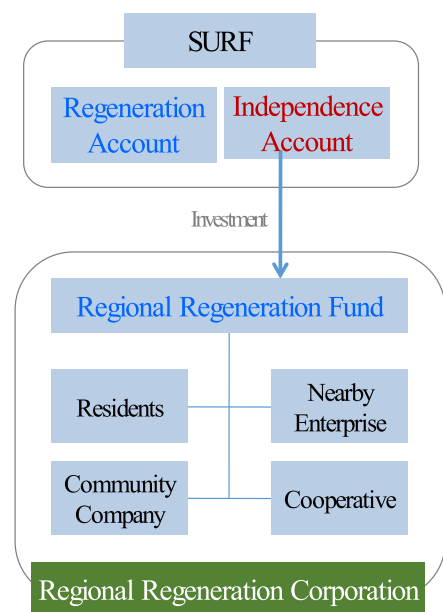
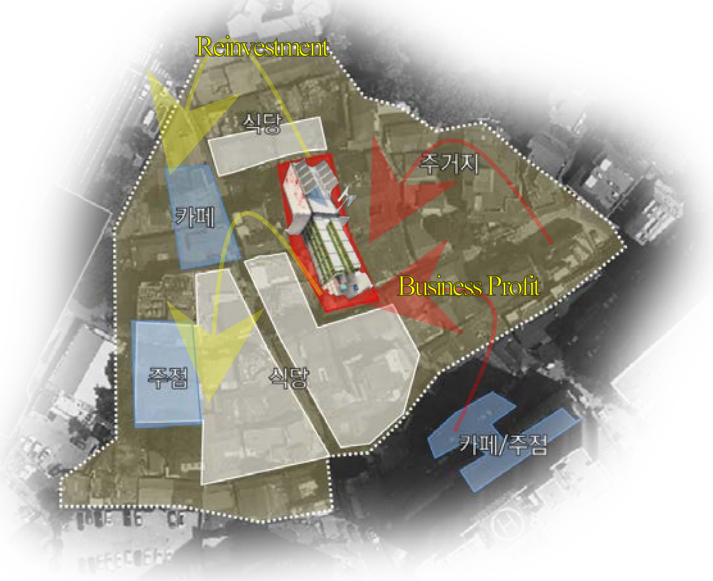


Figure 4-8 shows an example of LM model application to the maturity stage. As mentioned earlier, at this stage, the public sector is no longer the leading entity of urban regeneration. As can be seen in the figure, the arrows indicating the movement of profit generated in the region do not come out of the region. In other words, all profits, contributions, and allotments generated within the region go to the regional regeneration fund, not the SURF, and go out from there and go back to the region. This Regional Regeneration Fund is operated by a regional regeneration corporation established in association with local residents, neighboring companies, community companies, and cooperatives. At this stage, all funds from the independence account that SURF has been managing so far are transferred to the Regional Regeneration Fund. After the transfer of funds is completed, SURF only plays a subsidiary role of partly sharing the financial burden of the regional regeneration fund and supporting it in the form of investment funds if necessary.

[Figure 4-8] Case of Chungjeong-ro 4-gil at the maturity stage

Transfer of the SURF's independence account to private fund (investment)

⇒ Self-management led by private corporations





### 5) Sub-conclusion

This section looked at the urban regeneration strategy using governance in terms of the utilization of SURF itself and financial diversification. In particular, the LM model presented in this report is meaningful in that it comprehensively reviewed SURF's financial management in connection with the business model. Until now, the Seoul Metropolitan Government has devised policies by separating the development of the business model and the operation of financial resources, so there have been financial problems in the process of implementing the project. However, in the case of the LM model, the problem was solved by dividing the business model into stages according to the timing of the project's performance and matching the appropriate funding operation to each stage. In addition, LM is also meaningful as a financial diversification plan to solve the problem of monotonous SURF income structure. In other words, the LM model provided a plan to secure private finance by cultivating the economic capacity of the local community, reducing the public's financial burden step by step, and ultimately, a completely independent operation plan. Through this, if the private sector leads urban regeneration, it is possible to develop policies tailored to the needs of the region. In this respect, LM is the most suitable form for smart urban regeneration strategies to solve the challenges cities face in a more future-oriented manner.

However, despite these implications, this model has limitations. First of all, in order for the LM model to be practically applied, the enactment of related laws must precede. In particular, this is because, in order for local governments or regional regeneration corporations to collect allotments from residents in urban regeneration areas, the SAUR must be reflected in the Framework Act on the Management of Charges as a base law that can impose levy (Article 3 of the Framework Act on the Management of Charges). This law defines all financial burdens other

than taxes imposed by local governments or corporations in connection with a specific business as a levy (Article 2 of the Framework Act on the Management of Charges) and adopts strict legalism. In addition, in order to incorporate some of the contributions, allotments, and profitable business into SURF's financial resources, accurate and fair calculation standards are required. In particular, when a regional regeneration corporation becomes the management entity in the maturity stage, issues about the legitimacy of imposition and collection rights may arise along with controversy over the relevant standards. Finally, in order to secure private resources, safety must be guaranteed in addition to profitability. For this, the method of using Fintech should be considered more deeply<sup>12</sup>. For example, cryptocurrency technologies characterized by high security and hyper-connectivity still have unresolved security vulnerabilities. In addition, more careful consideration is required in that it adds speculative elements to public projects. This is also the case for the use of private resources through cloud funding. However, in the long term, more in-depth research is needed for developing a means of financing urban regeneration projects using Fintech.

## **V. Conclusion**

This report has attempted to devise a plan to effectively support urban regeneration projects and diversify financial resources by making the best use of SURF. To this end, first, the

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<sup>12</sup> Fintech is a compound word of Finance and Technology, which collectively refers to changes in the financial industry through the convergence of financial services and information technology (S. Choi et al., 2016). Fintech is a technology that can be used in relation to the means of raising business funds for urban regeneration. However, in order to be introduced as an actual financing method, it is considered that institutional and technical supplements are still needed.

operation status of SURF was evaluated to identify points in need of improvement, and based on the analysis results, the utilization plan of SURF was reviewed.

SURF was established in 2017 to overcome the limitations of the current budget system, which did not reflect the characteristics of urban regeneration projects with a long project period and frequent plan changes. This is because, unlike the budget, the Korean local government can change the fund management plan without the approval of the local council within the range of 20% of the expenditure. This report reviewed the operating status of SURF from 2018 to 2019 dividing it into revenue and expenditure to assess whether SURF is operating properly for this purpose. As a result of reviewing the revenue side, SURF's source of revenue consists only of overconcentration charges, and the surplus assets are also passively deposited in bank deposits; thus, it is necessary to diversify the financial resources and actively utilize the surplus assets. Meanwhile, as a result of reviewing the expenditure side, SURF showed a higher rate of change than the budget (general account, special account) in both expenditures compared to the previous year and expenditures against the plan for the current year. In particular, the SURF showed a higher rate of change than the special account whose target projects are the same as SURF, so SURF was being operated flexibly in both time series analysis and cross-sectional analysis.

Based on the results of this evaluation, this report presented alternatives to make good use of SURF itself in terms of utilizing SURF's surplus assets and diversifying its financial resources. First of all, regarding the use of surplus assets, the proposal for the stock investment of SURF's surplus assets by using the phenomenon of Korea-US stock price co-movement was reviewed. The review analyzed the predictive power of the US stock prices to the Korea stock prices by conducting Pearson correlation analysis and multiple regression analysis with a data set of representative stock indices (KOSPI 200, S&P 500, DJIA) from 2010 to 2019. As a result of

Pearson's correlation analysis, a statistically significant positive correlation was found between the US stock indices and the Korean stock indices over the entire study period, indicating that there is a clear co-movement phenomenon between the two. However, unlike the results of this Pearson correlation analysis, the results of multiple regression analysis over the entire study period showed that an increase in the S&P 500 was associated with a decrease in the KOSPI 200. Accordingly, the entire period was divided into two-year units, and regression analysis was additionally performed for each period, but as a result, no unified conclusion could be drawn. In other words, the analysis results showed the contrary effect by period and even resulted in doubting the statistical significance of the correlation between variables. This is insufficient to clearly prove or deny the existence of the Korea-US share price co-movement phenomenon. These results can greatly impair the stability of SURF as a public fund. In the end, Seoul should not accept a proposal containing a stock investment plan for SURF's surplus assets on the basis of the stock price co-movement between Korea and the US. This is because it may be possible to make profits when the stock price co-movement is clear, but when it is not, there is no choice but to lose a lot. In addition, the phenomenon of stock price co-movement shows a different trend by period, so it is not possible to predict the timing of occurring the phenomenon in advance.

This report also presented a Lifetime Management model in terms of diversifying the financial resources of SURF. The LM model has significance in that it not only diversifies SURF's financial resources but also connects urban regeneration project models and financial management plans step by step using governance. In addition, a hypothetical case analysis was conducted by selecting an actual area (Chungjeong-ro 4-gil) in Seoul so that the discussion on the LM model is not limited to theoretical ones. The LM model is largely divided into three stages: introduction, formation, and maturity. The introduction stage is the stage at which the

urban regeneration project begins, led by the public sector. Local governments play a role in analyzing the characteristics of urban regeneration areas and developing profitable businesses suitable for the area. Here, the role of SURF is to unilaterally support the project, and profit-making businesses in the region are operated by individual residents who have not yet been organized. Next, the formation stage is a period in which the capacity of the private sector grows in earnest based on the independence gradually cultivated in the introduction stage, led by the government and the private sector together. At this stage, SURF is divided into a regeneration account and an independent account, and some of the benefits generated through the urban regeneration project are incorporated into the revenue source of the independent account. The funds secured in this way are reinvested in the region, which forms a virtuous cycle. In addition, at this stage, an organization is formed by a coalition of local residents and companies, and this organization emerges as the leading entity of regional regeneration as a partner of the government. Finally, the maturity stage is the stage in which the autonomous capacity of the urban regeneration area has been sufficiently cultivated. At this stage, a regional regeneration corporation is established to comprehensively manage urban regeneration in the region. In addition, all funds accumulated in the independence account of SURF managed by the local government will be transferred to the Regional Regeneration Fund operated by the Regional Regeneration Corporation. At this stage, the government partially participates only when necessary, and local communities lead independent and self-sustaining urban regeneration of the region.

This LM model can solve problems caused by inconsistency between projects and finances by linking the project model and financial operation by stage. In addition, it can contribute to diversifying the SURF's financial resources by securing those from the private

sector through utilizing governance in the urban regeneration process. Urban regeneration led by the private sector enables the development of customized policies for each region, so it is an assumption suitable strategy for smart urban regeneration to solve future-oriented problems facing cities. Urban regeneration led by the private sector enables the development of customized policies for each region, so it is the most suitable strategy for smart urban regeneration to solve challenges cities face in a future-oriented manner. However, in order to actually apply this model, a revision of the law must be preceded to incorporate the benefits obtained in virtue of urban regeneration projects into SURF's financial resources. In addition, measures to strengthen safety to secure private financial resources should be prepared. The city of Seoul is expected to play a role in leading urban administration in Korea by reflecting the policy alternatives proposed in this report in its urban regeneration policies while making efforts to solve these problems in the future.

### References

- Cho Dam, Richard, J., & Bauer. (2002). *An Empirical Study on the Stock Price Response of Asian Emerging Markets to US Stock Price Change*. 135–157.
- Choi, H.-J. (2015). *General Status of Aging and Policy for Population Aging* [PowerPoint Slide]. SERO MAZI plan, Ministry of Health & Welfare ROK.
- Choi, S., Noh, S., & Gi, C. (2016). *Discover research fields through analysis of domestic and international fintech related technologies and policy trends*. Korea Internet & Security Agency.
- Hong, S., & Yoon, B. (2015). *Analysis of income and expenditure and financial risk* (Research Report No. 2015–005). Audit and Inspection Research Institute.
- Investment Pool for Public Funds*. (n.d.). Retrieved January 26, 2021, from [https://www.fundpool.com/app/investpool/invest\\_product.jsp](https://www.fundpool.com/app/investpool/invest_product.jsp)
- Ji, C., Cho, D., & Yang, C.-Y. (2001). Influence of US stocks on Korean stock price fluctuations. *Korean Securities Association*, 28(1), 1–19.
- Jun, S., & Choi, J.-Y. (2003). Analysis of Investment Behavior : From the Perspective of Capital Market Comovements. *THE KOREAN JOURNAL OF FINANCIAL MANAGEMENT*, 20(2), 127–150.
- Jung, C., & Lee, S. (2019). *A study on ways to improve the efficiency of local governments' spare funds through Investment Pool for Public Funds* [Research Report]. National Assembly Budget and Accounting Special Committee.
- Kang, M. (2015). Smart city concept and meaning. *World and city*, 9, 20–27.
- Kim, E. (2016). *Analysis on the Stock Price Co-movement between Korea and US Markets After the Global Financial Crisis* [Myungji University].

[http://www.riss.kr/search/detail/DetailView.do?p\\_mat\\_type=be54d9b8bc7cdb09&control\\_no=e2b09ac6f53daa32ffe0bdc3ef48d419](http://www.riss.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=e2b09ac6f53daa32ffe0bdc3ef48d419)

Kim, H., Yeo, H., & Gwak, Y. (2015). *Analysis of the adequacy of the government fund surplus fund management plan: Focusing on the calculation of the pension fund's target rate of return and the asset allocation process* [Research Report]. National Assembly Budget Office.

Ko, Y., & Jo, S. (2004). *Fund system improvement plan* [Research Report]. Korea Development Institute.

*KOSIS National Statistics Portal*. (n.d.). Retrieved November 20, 2020, from

[https://kosis.kr/statisticsList/statisticsListIndex.do?menuId=M\\_01\\_01&vwcd=MT\\_ZTITLE&parmTabId=M\\_01\\_01#SelectStatsBoxDiv](https://kosis.kr/statisticsList/statisticsListIndex.do?menuId=M_01_01&vwcd=MT_ZTITLE&parmTabId=M_01_01#SelectStatsBoxDiv)

Kwon, J., & Kim, S. (2014). Significance and Limits of the Special Law on Urban Regeneration Promotion and Support: Focused on the Perspective of Urban Policy. *Journal of the Korean Intellectual Information Society*, 16(1), 83–101.

Kwon, S.-H. (2008). Improvement tasks for efficient local fund operation. *Social Science Research Paper*, 20, 93–132.

Lee, M.-W., Hwang, S., & Jeong, H. (2001). *A study on the division of roles between general account, special account, and fund* [Research Report]. Korean Public Economics Association.

Lee, S., & Lee, J. (2013). A study on financing and management and operation of urban regeneration projects using TIF and BID. *The Korean Urban Management Association*, 26(1), 117–141.



Lee, W., & Gwak, H. (2012). *Measures to improve the utilization of surplus funds* [Research Report]. National Assembly Budget and Settlement Special Committee.

Lim, J. (2017). The future of agriculture, Agtech startup. *LG Economic Research Institute*.

Oh, B. cheol, & Pakr, S. (2009). An Empirical Analysis on the Synchronization of Stock Prices between Domestic and Foreign Stock Markets. *Korean Society for Aviation Management*, 2009(0), 223–236.

Park, K. (2014). *Korea Finance*. Beopwoosa Publishing House.

Park, M. (2017). *Seoul Urban Regeneration Fund establishment and operation plan*. Seoul Metropolitan Government.

*Seoul Urban Regeneration Portal*. (n.d.). Retrieved November 20, 2020, from <https://uri.seoul.go.kr/surc/archive/multiDeclineResult.do>

Shim, J. (2015). *Evaluation of the management status of the surplus funds of the fund* (Research Report No. 15–05). National Assembly Budget Office.

Yoo, J., Park, J., Jeong, S., & Kim, T. (2013, March). The necessity of urban regeneration and policy tasks. *Korea Research Institute for Human Settlements*, 416, 1–6.

## Op-Ed

### **Now, stop the excuse of not being able to do public works due to lack of money!**

We have seen too often and for a long time that the government cannot do public works or delay implementation due to insufficient budget. But now these excuses no longer come to work. This is because the results have recently been confirmed that the current local government's budget is not suitable for large-scale public projects, and the funds are not being utilized efficiently. In other words, it is inefficient utilization that is more of a problem than an absolute lack of public finance.

These results were revealed by a research project under the theme of "A Study on the Operation of Seoul Urban Regeneration Fund" by Mingu Park, a graduate student in the Master of Public Administration program at Florida State University. This study evaluated the management status of the Seoul Urban Regeneration Fund (SURF), which was first established by the Seoul city government in 2017 in Korea. In this research report, he evaluated that SURF has a narrow source of income and is passively operated its surplus assets.

He also suggested an efficient utilization plan of SURF based on these evaluation results. First of all, in relation to the utilization of SURF's surplus asset, he analyzed the validity of the investment plan utilizing the phenomenon of Korea-US stock price co-movement. As a result of the analysis, however, since the consistency of the stock price co-movement phenomenon has not been confirmed over the past 10 years, he recommended Seoul not to adopt the investment plan. In addition, in this research, he presented a Lifetime Management (LM) model using governance in relation to the financial diversification of SURF. The LM model divides the stages of urban regeneration projects into three stages of introduction, formation, and maturity, and utilizes governance to diversify the financial resources of SURF by linking the business model and financial management plan in stages. The bottom line of this model is that the role of the private sector increases as the stage of urban regeneration projects matures while the role of the public sector decreases. This role change is made through governance, and it is suggested by linking the specific SURF operation plan and the leading subject of the project by stage.

He said, "The LM model will enable Seoul to make sustainable and self-sustaining urban regeneration projects possible."; and, added, "I hope this study will be applied not only to SURF but also to the overall fiscal management of the public sector so that public projects will no longer be delayed due to lack of funds." If you have any inquiries about this study or need more specific information, feel free to contact the researcher directly at the contact information below.

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### **About the Author**

Mingu Park is a public servant in Seoul, the capital city of Korea. He earned a bachelor's degree in economics and a bachelor's degree in trade from Kyunghee University and began his public career in 2006. He worked as an auditor at the Seodaemun-gu audit office for five years, covering all areas of administration such as budget, accounting, urban development, and transportation, and then worked in the fields of housing, architecture, and city management for another five years. Later, he moved to Seoul Metropolitan Government, where he was in charge of urban regeneration and organization. In 2019, he was selected to receive the Seoul Metropolitan Government Long-Term Fellowship for Overseas Studies, and then he is studying at Reubin O'D. Askew School of Public Administration and Policy to earn his master's degree in public administration.

He has shown keen interest in the areas of urban administration and public finance, and has a belief that each area of administration should be linked and integrated with each other. With this belief, he established Seoul Urban Regeneration Fund for the first time in Korea to solve the problem of financing the urban regeneration project, and has continued to make efforts to incorporate economic and financial ideas into each area of administration.

He lives in Tallahassee, Florida with his wife Hanhee, his son Jehu, and daughter Jeyeon.