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A Study on the Local Economy Ripple Effect due to General Industrial Estate Regeneration Project¹

- Focused on Jinju City's Sang-pyeong General Industrial Complex -

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Abstract

Today, the interest in the old industrial complex's regeneration project is heightened. That's because the existing industrial complex leading Korea's growth period has declined by external factor including economic recession and industrial structure change and because the need of regeneration project has been largely increased to convert the industrial complex in other use or to activate the industrial complex. Government and local government are planning a new industrial complex that highly contributes to local government development to attract the local new growth industry and to recover the function of the existing industrial complex by repairing the old industrial complex. Jinju City's Sangpyeong General Industrial Complex was classified actually as the old industrial complex created in 1981, with the regeneration project plan of government and local government progressed. Created as general industrial complex, it has displayed a main role for economic activation of the West Gyeongnam as an industrial complex based on the West Gyeongnam, but began to fall behind due to those factories to be closed and ceased by economic downturn and to the increased facility location with a wrong use. As the urban expansion is continuously realized, Sangpyeong General Industrial Complex, located actually in town and visited by people, needs more regeneration projects.

Accordingly, this research has as its object in looking into the ripple effect of local economy by the regeneration project of Sangpyeong General Industrial Complex preparing the second renaissance. The research was made from Sangpyeong General Industrial Complex according to the historical background in progress of regeneration project. Its analysis method included the basic theory research and literature search, and the Keynesian multiplier theory models were used to analyze the ripple effect of multiplier of business area's land acquisition cost to local economy, and input output model was executed to look into socio-economic effect through the cost invested in industrial complex project.

Keywords

General Industrial Complex, Regeneration Project, Keynesian multiplier models, Input-Output Model

JEL classification

O18, R11, R15, R51, R53

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I . Introduction

1. Research Background and Purpose

The formation of Industrial complexes, which began in the 1960s for the economic development in Korea, served as a momentum in promoting balanced regional development and opening the industrialization era. Currently, industrial complexes play a vital role in regional economic development by boosting the cultivation of regional strategic industry and creating local employment opportunities.

However, industrial complexes which have been operated for about 50 years are being deteriorated and lost its function. Therefore, the regeneration projects for industrial complexes or the design of the new industrial complexes are formulated for the revitalization of the regional economy in some areas.

The concern on deteriorated industrial complexes has been increasing in recent days. Since industrial complexes, which had led the economic growth of Korea, began to decline by external factors such as the economic stagnation, the change in industrial structure, and the deterioration of facilities, the need for the regeneration project has been raised along with the request for the change in the use of existing industrial complexes and revitalization.

In addition, the Government and local governments are planning to perform the structural enhancement project and regeneration project for the great contribution to the development of the regional economy with attracting regional new-growth industry through the maintenance of the deteriorated industrial complexes.

Jinju Sangpyeong General Industrial Complex was created in 1981, where the regeneration projects of the government and local governments have been underway because this complex was classified as one of the deteriorated industrial complexes. It has played a central role in the economic revitalization of the western part of Gyeongnam as a base industrial complex in the western Gyeongnam so far, but it began to be deteriorated due to the shutdown or closing of factories caused by the economic downturn and an increase in the facility location for the inappropriate use.

Above all things, since Sangpyeong General Industrial Complex is currently located in the built-up area, where coming and going of citizens is frequent as a result of the continuous

urban expansion, regeneration projects are more required in this area. In this regard, this study puts its purpose in examining the ripple effect of the regional economy in preparation for the generation projects in the Sangpyeong General Industrial Complex in an expectation of the second Renaissance.

Therefore, it intends to provide basic materials for improving the revitalization of the regional economy in Jinju-si by conducting the research regarding the ripple effects of the regeneration project on the regional economy.

2. Research Scope and Method

The target area in this research was set by focusing on the Sangpyeong General Industrial Complex, which is the small city of the western part of Gyeongsangnam-do and located in Jinju-si, which is one of representative cities in Gyeongsangnam-do.

The research was conducted in consideration of the time period. As analysis methods, groundwork theoretical research and literature research were utilized. Keynesian multiplier effects were applied to analyze the regional economic multiplier effects as a result of land compensation within the project zone. The study was conducted by utilizing the input-output model to investigate social and economical effect through the costs, invested in the creation of regeneration project complexes.

Land compensation was set on a basis of the publicly notified land price within the project zone, and then nationwide multiplier effects were estimated. An analysis of the economic ripple effect produced results by drawing up the Inter-Regional Input-Output(IRIO) Table for Gyeongsangnam-do, which includes the research target area and the other area.

In this study, it is expected that ripple effect will be higher in the Sangpyeong General Industrial Complex, influenced by the regeneration project in the prediction of income-generating effect and production efficiency through the Keynesian multiplier effects and the input-output model. Therefore, It is expected that the economic ripple effect will be maximized across the nation, apart from the economic growth in the regeneration projects in the Sangpyeong General Industrial Complex.

II . Theoretical Study

1. Investigation into the Previous Studies in regard to the Ripple Effect of the Industrial Complex

The studies on the industrial complexes have been continuously conducted since the 1980s, but it is identified that studies for the purpose of the revitalization and regeneration in industrial complexes began from the 2000s. It is estimated that such trend was due to the creation of new industrial complexes as well as an increase in deteriorated industrial complexes in the 2000s. The regional input-output model, Inter-relation model, economy-based model, regional econometric model, and the Keynesian multiplier effects were used for the study of ripple effect without a significant difference in the analysis method.

Lee Jae-Hong (2007) analyzed the ripple effect of the development of high-tech industrial complex in Chungju on the regional economy, in which regional input coefficients were derived from the locational quotient. Finally, the economic ripple effect was derived from the Inter-Relation Model by calculating the influential power and sensitivity coefficients in each industry of Chungju region.

Choi Seok-Jin (2007) analyzed the ripple effect of structural enhancement projects in the Seoul Digital Industrial Complex. He derived ripple effect from the business profiles of income and expense according to scenarios based on the structural enhancement, basic plans, project costs, and sales revenue in the Seoul Digital Industrial Complex.

Jeong Ji-Eun (2009) evaluated that the Kaesong industrial complex project contributes to the regional development in some ways by utilizing the Inter-Regional Input-Output (IRIO) and analyzed the ripple effect with a view to suggesting the economic implications in terms of the policy.

Eom Su-Won (2010) analyzed the multiplier effects of the land acquisition cost on local economy around the regeneration projects in the first and second Daejeon industrial complexes by utilizing the Keynesian multiplier effects and the Multi-Region Input-Output(MRIO). Through this analysis, it estimated the effect of the land acquisition cost on other areas's as well as relevant areas in the creation stage of the industrial complex.

Park Ji-young, Park Chang-Geun (2010) analyzed the economic ripple effect which includes the possibility of corporate disclosure in Gyeongsangnam-do in preparation for the creation of

Daegu national industrial complex by using the Multi-Region Input-Output (MRIO) between regions. They predicted the ripple effects on the assumption of four scenarios, which can occur in the project propulsion process according to regions.

There were no significant differences in the techniques, used for the review of existing studies, and this study also has no significant difference in techniques, used for the existing studies on ripple effects. However, it shows a difference in the physical range because it analyzed the ripple effect of the regeneration project in the Sangpyeong General Industrial Complex, which is newly formulated.

Also, it is possible to evaluate that the value of scarcity in the regeneration projects of the small and medium-sized local industrial complexes because the regeneration projects will continuously proceed through the remodeling comprehensive plans for the deteriorated industrial complexes, set by the Ministry of Land, Infrastructure and Transport.

2. Investigation into the Previous Studies about the Ripple Effects on the Local Economy

Studies on the ripple effects of regional economy have been continuously conducted since the past. This shows that economic effects, obtained from the execution of projects, are essential, when a project is executed, whatever it is.

Moon Ji-Hyo (2010) analyzed the ripple effect of regional economy, caused by the World Leisure Congress Chuncheon 2010, It derived results by using the Multi-Region Input-Output (MRIO) among regions, and it also verified that sports events are the method to be helpful to the growth of regional economy by analyzing the ripple effects of regional economy in regard to the tourist economy according to the host of sports event.

Jung Geun-Oh and Im Eung Soon (2001) conducted a comparative analysis on the economic ripple effect of life insurance industry and insurance industry against loss. To be specific, they analyzed production-induced effect, value-added effect, and employment-induced effect through the demand-driven model, and furthermore, they examined price ripple effects to explore the price change in the insurance industry.

Song Hak-Joon and Chung (2012) used the Inter-Regional Input-Output model (IRIO) to analyze the economic ripple effect according to the invigoration projects in traditional markets and derived the firsthand and secondhand ripple effects according to the invigoration

projects in traditional markets after calculating the sales amount by conducting questionnaire surveys on the traditional market merchants.

Han sang-Lin and Lee, Sung-ho (2014) analyzed regional economy ripple effects in the distribution industry of Seoul city by utilizing the Inter-Regional Input-Output (IRIO) Model between regions. They analyzed the economic ripple effect in the distribution industry, which is at the center of national economy, and discussed implications for the cultivation of the distribution industry and the maximization of the economic effect.

3. Keynesian Multiplier Model

Keynesian multiplier effects are that the expenditure or consumption of one economic subject becomes the income of another economic subject. To be specific, as income increases, consumption does. Put simply, an increase in saving in accordance with the increase in income is connected to the extension of the increase in saving. It is seen as an increase in additional income. Accordingly, such cumulative income-generating creation effect, which is connected to the increase in income is converged until reaching at a certain level (Eom. 2010).

According to the Keynesian multiplier theory, multiplier becomes higher as the marginal propensity to consume is larger. In other words, the speed of the chain reaction is faster as people spend more money. Saving slows the speed of the chain reaction.

In this regard, the marginal propensity to consume is the rate of amount, consumed without being saved among the additional income. The proportion of the saving amount in additional income is called ‘the marginal propensity to save.’ In general, people with higher income have a lower marginal propensity to consume than people with lower income, while they have the higher marginal propensity to save. In addition, the marginal propensity to consume is higher when inflation comes.

As the marginal propensity to consume is higher, consumption sharply increases in accordance with the increase in income. Therefore, the effect of the consumption increase in economy gets stronger, and subsequently the effect of financial policies becomes stronger as the marginal propensity to consume gets higher.

The Keynesian income and expenditure model based on the Keynesian multiplier effects to predict regional income-generating effects is shown as follows:

$$Y = C + S = C + I$$

$$\Delta Y = \Delta C + \Delta S = \Delta C + \Delta I$$

Y : Regional Incomes ΔY : Increase of Regional Income
 C : Regional Consumptions ΔC : Increase of Regional Consumptions
 S : Regional Savings ΔS : Increase of Regional Savings
 I : Regional Investments ΔI : Increase of Regional Investments

To calculate regional income growth quantitatively, investment increase (ΔI) should be obtained through the marginal propensity to consume(c) and marginal propensity to save(s).

$$\Delta Y = [1/(1-c)] \times \Delta I = k \Delta I$$

$$\Delta Y = (1/s) \times \Delta I = k \Delta I$$

$$k = 1/(1-c) = 1/s$$

Investment multiplier(k) grows bigger as marginal propensity to consume(c) is higher, while Investment multiplier(k) grows smaller as marginal propensity to consume(c) is lower. Put simply, it is said that higher consumption propensity brings about greater income-generating effects according to the increase in investment.

4. Input-Output Model

The Input-Output Model is used as a useful tool, which estimates firsthand effects, secondhand effects, and induced effects for the production, income, employment, value-added, income tax, and revenue in industries. Simply put, the Input-Output Model and the IRIO Model are treated as the same meaning.

The product, produced in one industry, is closely correlated to another product directly and indirectly because it can be input as a raw material for the production of the product in the different industry. Therefore, the Input-Output Model is the analysis technique to identify the relation between industries quantitatively.

On account that one industry is combined with the whole industry, comprehending the entire national economy, an analysis of the associative relations between industries is feasible, which is advantageous to the analysis of the concrete economic structure(Gang, 2000).

In the case of the analysis by applying the Input-Output Model, the ripple effects of the

production, employment, and income were incurred by the final demand on the regional economy according to the different sections of the industry. Therefore, This model has been used as a useful analysis tool, advantageous to the economic prediction and the orientation of the industrial policy.

To make use of the Input-Output Model, the Inter-Regional Input-Output Table should be made. In the input-output analysis, coefficient (a_{ij}), input in the production of one unit product in j industry is shown.

$$a_{ij} = \frac{X_{ij}}{X_j}$$

a_{ij} : Input coefficient of i industry that has been put in to produce the product one unit of j industry

X_j : The total output of industry j

X_{ij} : Intermediate input amount that has been put into i industry from j industry

The relations of input coefficient (A) and output (X) and final demand are shown as follows:

$$X = AX + Y$$

$$A = \begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1i} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2i} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\ a_{i1} & a_{i2} & \cdots & a_{ii} & \cdots & a_{in} \\ \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{ni} & \cdots & a_{nn} \end{pmatrix} \quad X = \begin{pmatrix} X_1 \\ X_2 \\ \vdots \\ X_i \\ \vdots \\ X_n \end{pmatrix} \quad Y = \begin{pmatrix} Y_1 \\ Y_2 \\ \vdots \\ Y_i \\ \vdots \\ Y_n \end{pmatrix}$$

If the equation above is transformed, the Leontief inverse coefficients can be obtained.

$$X = (1 - A)^{-1} Y$$

$(1 - A)^{-1}$: Leontief Inverse Matrix

$(1 - A)^{-1}$ as Leontief inverse coefficients can be used for the several purposes. Such coefficients are the figures which are quantified value in regard to the relations between input-output and real economic activities by implication. The calculation of Leontief inverse coefficients through utilizing the existing survey data, the prediction of several industrial activities of the future is feasible.

The determinant used for deriving the Production-induced effects, income-induced effects,

and employment-induced effects by using the Inter-Regional Input-Output (IRIO) Table is shown as follows:

$$\begin{aligned} X &= (I - A_0^d)^{-1} \times Y \\ V &= A_v (I - A_0^d)^{-1} \times Y \\ P &= A_p (I - A_0^d)^{-1} \times Y \\ W &= A_w (I - A_0^d)^{-1} \times Y \end{aligned}$$

X = Production ripple effect

V = Value-added ripple effect

P = Import ripple effect

W = Employment ripple effect

Y = Sangpyeong General Industrial Complex regeneration Expenses

III. Status of target areas, and analysis framework configuration

1. Status of target areas

The Sangpyeong general industrial complex was designated as a general industrial complex according to the article 7 of the Act regarding the industrial location and development in 1978. This complex is located in the whole area of Sangdae-dong and Sangpyeong-dong, Jinju-si in the area of 717 lots, 2,135,000m.

Sangpyeong General Industrial Complex accommodates 522 business fields, including metal machines, textile (silk), timber & paper, food, automobile and transportation equipment, which is the representative industrial complex in the western Gyeongnam.

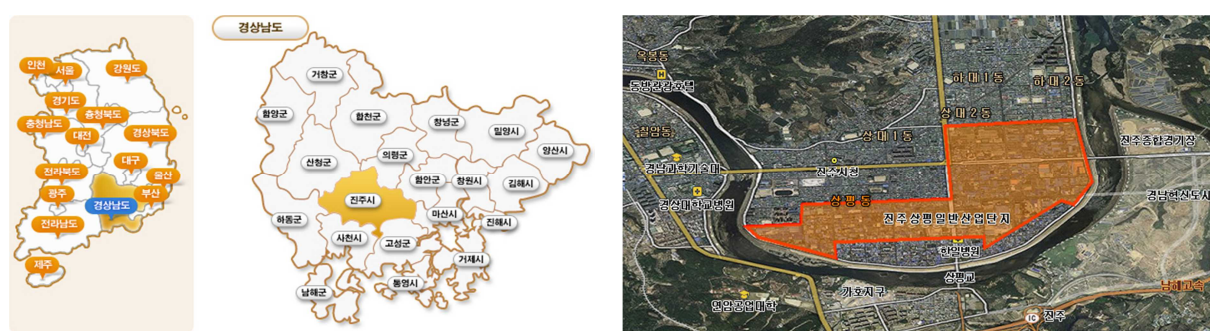


Fig.1 Sangpyeong General Industrial Complex location

Most buildings in the Sangpyeong General Industrial Complex, which is the base industrial complex in the western Gyeongnam, are deteriorated because they were built over 20 years ago, shown in the review of <figure 2>. With the creation of residential complex nearby the Sangpyeong General Industrial Complex, all sorts of complaints have been poured. Therefore,

conflicts with local residents and the risk of fire due to the defect of worn-out machines are on the increase.

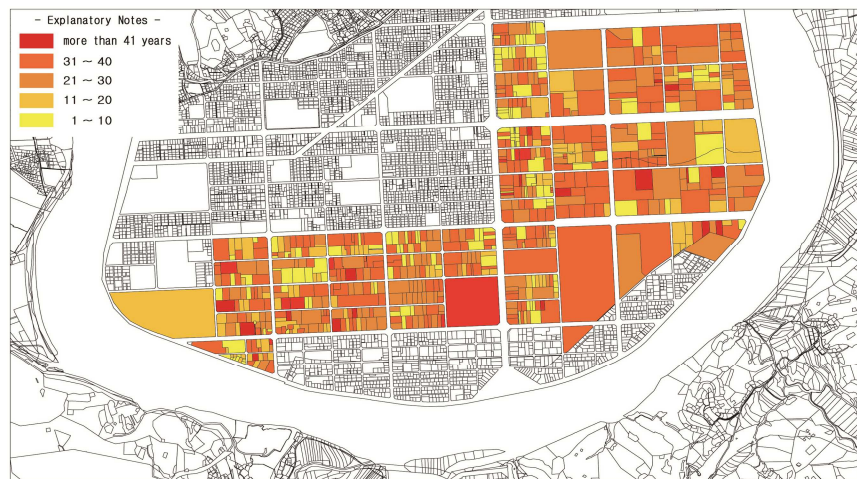


Fig.2 Sangpyeong General Industrial Complex Deteriorated

In addition, the productivity of enterprises has been reduced due to the lack of infrastructure and support facilities and the incorporation of the industrial complex into the city due to the urban expansion has been an obstacle to forming the effective space of the urban structure. In addition, this complex is adjacent to the downtown of the city, so that there is a limit in the land use.

Therefore, the deteriorated Sangpyeong General Industrial Complex was selected as a project place of regeneration in the comprehensive remodeling plans for the deteriorated industrial complex and currently administrative procedures according to the regeneration project are progressing.

With the creation of the Multiple Complex Town such as convention centers and business park, the expansion of green park and public parking lot, and infrastructure and the expansion of support facilities, the plans for the improvement in labor environment are underway.

2. Analysis framework configuration

This study utilized the Keynes multiplier theory model and the input-output model to analyze the ripple effect of the regional economy in accordance with the regeneration project in the Sangpyeong Industrial Complex. It is expected that economic ripple effects in the process of the regeneration projects in this complex can be divided into two stages; land compensation and the creation stage of the complex.

The phase-in regeneration project is expected to induce the firsthand ripple effect to the regional economy. To analyze the multiplier effect of the compensation in the land compensation stage, the Keynesian multiplier theory was applied to produce the results of the nationwide ripple effect.

The creation stage of the complex is the stage of establishing the Infrastructure and expanding support facilities, so that the input-output model is applied to estimate the ripple effect of investment project costs for the creation of the complex.

Regarding the input-output model, the Inter-Regional Input-Output Model (IRIO), ‘offered by the Bank of Korea is utilized for the analysis of the production ripple effects, value-added ripple effect, income ripple effects, and employment ripple effects.

Table. 1 Analysis framework configuration

| Land Compensation | The Construction Cost of Complex |
|----------------------------|----------------------------------|
| Keynesian Multiplier Model | Input-Output Model |

IV. Empirical analysis

1. The Stage of the Land Compensation

The multiplier theory of Keynes's theory plays a key role in understanding the theory and model about the analysis of ripple effects (Eom, 2010). The project zone, which generates land compensation in the regeneration project of the Sangpyeong Industrial Complex, is the planning lot of Multiple Complex Town, which accounts for 53.1% of the entire area with 1,134,000m² .

The publicly notified land price in the project zone is the same as <table 5>. The land compensation cost in the regeneration zone of the Sangpyeong General Industrial Complex was calculated on a basis of the publicly notified land price. This land compensation was estimated on a basis of the publicly notified land price because the regeneration project plan was at the initial stage and the standards regarding the land compensation was yet to be set.

Therefore, when land compensation is calculated on a basis of the publicly notified land price, it is expected to input about 339.73 million dollar.

Table 2. The Present Condition of the Land Value Surrounding Areas of the Sang-pyeong General Industrial Complex

| Name | Land use | Publicly notified land price in the project zone | Surrounding publicly notified land price | Note |
|---------------------------------------|---------------|--|--|------|
| Sangpyeong General Industrial Complex | Industry area | 299.6 dollar/m ² | 523.7 dollar/m ² | |

Data: Jinju-si(2014) The Report of the Present Conditions of the Jinju Sangpyeong Industrial Complex

As the land compensation of the regeneration project in the Sangpyeong General Industrial Complex, if 339.73 million dollar is brought to the regional economy, the estimated results by using the Keynesian multiplier theory to estimate the effect of regional income-generating effect will be as follows: The estimated investment coefficient by substituting the marginal propensity to consume, $c=0.75$ on a 2008 basis is $k=4$. If the estimated investment coefficient, $k=4$ is applied to the land compensation quantitatively, it will make it possible to calculate the income increase in the area. It is estimated that the national ripple effects of the regeneration project in the Sangpyeong General Complex would be a scale of one trillion and 1,359 million dollar.

Table 3. Land Compensation and Investment Multiplier Effect

| Areas | Investment Multiplier Effect |
|---------------------------------------|---|
| Sangpyeong General Industrial Complex | $\Delta Y(\text{increase in income}) = k \times \Delta I = 4(\text{Investment multiplier}) \times 339.73 \text{ million dollar (land compensation)} = \mathbf{1,359 \text{ million dollar.}}$ |

2. The Creation Stage of the Complex

To analyze the ripple effects in the regional economy according to the complex creation of the regeneration project in the Sangpyeong General Complex, this study examined the integration process into 29 sections or readjustment process in the Inter-Relational Input-Output(IRIO) Table between regions by reclassifying the construction sector, which is highly associated with the regeneration project. That is, this study tried to analyze the readjustment process in the Inter-Industry Input-Output Table to examine the sub-divided ripple effects by setting the expansion costs of infrastructure and the expansion costs of support facilities, and classifying the creation costs of the multiple complex town as those of the building construction.

Table 4. Readjusted Industry Sectors of the Regional Inter-Industry Input-Output Table

| No. | Industrial sectors | No. | Industrial Sectors |
|-----|--|-----------------------|---|
| 1 | Products of agriculture, forestry, and fisheries | 16 | Other manufacturing products |
| 2 | Mine products | 17 | Electricity, gas, and water |
| 3 | Beverage and food | 18 | Wholesale & retail sale |
| 4 | Textile and leather products | 19 | Restaurant & accommodation |
| 5 | Timber and paper | 20 | Transport |
| 6 | Print& copy | 21 | Communication & broadcasting |
| 7 | Petroleum & coal | 22 | Finance & insurance |
| 8 | Chemical product | 23 | Real estate & business service |
| 9 | Non-metal & mineral products | 24 | Public administration & national defense |
| 10 | Primary metal products | 25 | Education & health care |
| 11 | Metal products | 26 | Society and other services |
| 12 | General machine | 27 | Etc |
| 13 | Electricity & electronic equipment | Construction industry | 28 Building construction |
| 14 | Precision machine | | 29 Civil engineering & special construction |
| 15 | Transport equipment | | |

In addition, it configured the models of 2 regions; (G: Gyeongsangnam-do, O: the rest area) with Gyeongsangnam-do, which is inclusive of the research target area, and the other area with a view to examining the firsthand and secondhand effect of the ripple effects as a result of the regeneration project.

Table 5. Gyeongsangnam-do * The Rest Area, 2 regional model

| | | Demand | |
|-------|----------|----------|----------|
| | | <i>G</i> | <i>O</i> |
| Input | <i>G</i> | $G * G$ | $O * G$ |
| | <i>O</i> | $G * O$ | $O * O$ |

It is estimated that about 288.54 million dollar would be input in the regeneration project of the Sangpyeong general complex as shown in <table 6>. In the creation cost of the complex, the creation cost of Complex business Town is divided into the infrastructure and support facility expansion cost.

Table 6. The Project cost of the Regeneration Cost in the Sang-pyeong General Industrial Complex

| Division | Amount(million dollar) | Rate(%) |
|--|------------------------|---------|
| Total | 288.54 | 100% |
| The expansion of Infrastructure and Support Facility | 114.85 | 39.8% |
| The creation of Complex business Town | 173.69 | 60.2% |

∴ Data : Jinju-si(2014) The Report of the Present Conditions of the Jinju Sangpyeong Industrial Complex

1) Production-induced coefficients

Production-induced coefficients can confirm the additional economic activities in the regional economy as the final demand increases one unit more. The mean value of Production-induced coefficients is about 1.9586 in Gyeongsangnam-do on a basis of the Inter-Regional Input-Output Table.

This represents that the production-induced effects of about 1.9586 won(KRW) are generated in Gyeongsangnam-do when the 1 won(KRW) is spent for the creation of the complex in the Sangpyeong General Industrial Complex.

The industry, which is the highest in the production-induced effects, was Other products (2.8398, first place), which was followed by the primary metal products (2.4047, second place) and metal products (2.3973, Third place).

The production-induced coefficients (2.0824) in the construction sector appeared to be higher than the average of the whole industry (1.9524), while building construction placed 13th, and civil engineering and special construction placed 7th, which were at the medium level.

Table 7. Production-induced coefficients

| No | Industrial sectors | | Direct | Indirect | Aggregate | Ranking |
|----|--------------------|--|--------|----------|-----------|---------|
| 1 | Other Industries | Products of agriculture, forestry, and fisheries | 1.2199 | 0.5219 | 1.7418 | 22 |
| 2 | | Mine products | 1.2663 | 0.4886 | 1.7549 | 21 |
| 3 | | Beverage and food | 1.4349 | 0.6324 | 2.0673 | 12 |
| 4 | | Textile and leather products | 1.2484 | 0.8260 | 2.0744 | 11 |
| 5 | | Timber and paper | 1.2923 | 0.7247 | 2.0170 | 14 |
| 6 | | Print& copy | 1.2835 | 0.6879 | 1.9714 | 16 |
| 7 | | Petroleum & coal | 1.1225 | 0.4604 | 1.5829 | 26 |
| 8 | | Chemical product | 1.2162 | 0.9050 | 2.1212 | 9 |
| 9 | | Non-metal & mineral products | 1.3160 | 0.8224 | 2.1384 | 6 |

| | | | | | | |
|--|-----------------------|--|--------|--------|--------|----|
| 10 | | Primary metal products | 1.2380 | 1.1667 | 2.4047 | 2 |
| 11 | | Metal products | 1.3399 | 1.0574 | 2.3973 | 3 |
| 12 | | General machine | 1.3962 | 0.9498 | 2.3460 | 4 |
| 13 | | Electricity & electronic equipment | 1.2559 | 0.8664 | 2.1223 | 8 |
| 14 | | Precision machine | 1.1957 | 0.7235 | 1.9192 | 17 |
| 15 | | Transport equipment | 1.3393 | 0.7753 | 2.1146 | 10 |
| 16 | | Other manufacturing products | 1.3329 | 0.9238 | 2.2567 | 5 |
| 17 | | Electricity, gas, and water | 1.1435 | 0.1204 | 1.2639 | 29 |
| 18 | | Wholesale & retail sale | 1.2862 | 0.3616 | 1.6478 | 24 |
| 19 | | Restaurant & accommodation | 1.3461 | 0.6355 | 1.9816 | 15 |
| 20 | | Transport | 1.1439 | 0.4603 | 1.6042 | 25 |
| 21 | | Communication & broadcasting | 1.3281 | 0.5183 | 1.8464 | 19 |
| 22 | | Finance & insurance | 1.2916 | 0.3966 | 1.6882 | 23 |
| 23 | | Real estate & business service | 1.2063 | 0.2590 | 1.4653 | 28 |
| 24 | | Public administration & national defense | 1.3381 | 0.4513 | 1.7894 | 20 |
| 25 | | Education & health care | 1.1938 | 0.3706 | 1.5644 | 27 |
| 26 | | Society and other services | 1.3469 | 0.5677 | 1.9146 | 18 |
| 27 | | Etc | 1.8179 | 1.0219 | 2.8398 | 1 |
| 28 | Construction Industry | Building construction | 1.3151 | 0.7258 | 2.0409 | 13 |
| 29 | | Civil engineering & special construction | 1.3645 | 0.7594 | 2.1239 | 7 |
| The average of the construction industry | | | 2.0824 | | | |
| The average of the entire industry | | | 1.9586 | | | |

With the input of the creation cost in the regeneration project in the Sangpyeong General Industrial Complex, the firsthand and secondhand production ripple effects on the regional economy were a scale of 598.42 million dollar.

In particular, the ripple effects in the building construction caused by the creation cost amounted to about 354.48 million dollar, while the production ripple effect of infrastructure and the expansion cost of support facilities were about 234.97 million dollar.

In addition, with the input of the complex creation cost in the regeneration project, the firsthand ripple effects in Gyeongsangnam-do amounted to 228.42 million dollar in the building construction, and 156.72 million dollar in civil engineering and special construction, which was a total of 385.14 million dollar, while the secondhand ripple effects appeared to be a scale of 213.28 million dollar in total.

Table 8. Production Ripple Effect

(Unit: million)

| Division | Production Ripple Effect | | |
|----------------------|--------------------------|---------------------------|-------------------|
| | Firsthand Ripple Effects | Secondhand Ripple Effects | The Total Effects |
| Multiple Office Town | 228.42 | 126.06 | 354.48 |
| Support Facility | 156.72 | 87.22 | 243.97 |
| Total | 385.14 | 213.28 | 598.42 |

2) Value-Added Induced Effect

When a final demand, 1 unit is generated, the firsthand and secondhand value-added value induced effects come out as much as to satisfy the demand in each industry. The mean value of value-added value induced coefficients (0.8213) in the construction sector appeared to be higher than that (0.7359) of value-added induced coefficients in the whole industry.

The industry which is the highest in the value-added induced effects in the industries of Gyeongsangnam-do was the real estate and business service (0.9439, first place), which was followed by the finance and insurance (0.9328, second place), and wholesale and retail sale (0.9040, third place). Building construction in the construction sector and civil engineering and special construction appeared to placed 13th and 12th respectively.

Table 9. Value-Added Induced Effect

| No | Industrial sectors | | Direct | Indirect | Aggregate | Ranking |
|----|--------------------|--|--------|----------|-----------|---------|
| 1 | Other Industries | Products of agriculture, forestry, and fisheries | 0.6657 | 0.1887 | 0.8544 | 8 |
| 2 | | Mine products | 0.6509 | 0.1834 | 0.8343 | 10 |
| 3 | | Beverage and food | 0.5217 | 0.2622 | 0.7839 | 14 |
| 4 | | Textile and leather products | 0.3347 | 0.2773 | 0.6120 | 22 |
| 5 | | Timber and paper | 0.3533 | 0.2565 | 0.6098 | 23 |
| 6 | | Print& copy | 0.5627 | 0.2602 | 0.8229 | 11 |
| 7 | | Petroleum & coal | 0.1457 | 0.1537 | 0.2994 | 29 |
| 8 | | Chemical product | 0.3659 | 0.2708 | 0.6367 | 21 |
| 9 | | Non-metal & mineral products | 0.4206 | 0.3082 | 0.7288 | 17 |
| 10 | | Primary metal products | 0.2567 | 0.3039 | 0.5606 | 26 |
| 11 | | Metal products | 0.4086 | 0.3076 | 0.7162 | 18 |
| 12 | | General machine | 0.3962 | 0.3024 | 0.6986 | 20 |

| | | | | | | |
|--|-----------------------|--|--------|--------|--------|----|
| 13 | | Electricity & electronic equipment | 0.2709 | 0.2856 | 0.5565 | 27 |
| 14 | | Precision machine | 0.3406 | 0.2619 | 0.6025 | 25 |
| 15 | | Transport equipment | 0.3612 | 0.2449 | 0.6061 | 24 |
| 16 | | Other manufacturing products | 0.3938 | 0.3053 | 0.6991 | 19 |
| 17 | | Electricity, gas, and water | 0.4020 | 0.0516 | 0.4536 | 28 |
| 18 | | Wholesale & retail sale | 0.7368 | 0.1672 | 0.9040 | 3 |
| 19 | | Restaurant & accommodation | 0.5738 | 0.2671 | 0.8409 | 9 |
| 20 | | Transport | 0.5635 | 0.1670 | 0.7305 | 16 |
| 21 | | Communication & broadcasting | 0.6341 | 0.2571 | 0.8912 | 5 |
| 22 | | Finance & insurance | 0.7214 | 0.2114 | 0.9328 | 2 |
| 23 | | Real estate & business service | 0.8236 | 0.1203 | 0.9439 | 1 |
| 24 | | Public administration & national defense | 0.6901 | 0.1714 | 0.8615 | 7 |
| 25 | | Education & health care | 0.7572 | 0.1446 | 0.9018 | 4 |
| 26 | | Society and other services | 0.6555 | 0.2127 | 0.8682 | 6 |
| 27 | | Etc | 0.3359 | 0.4149 | 0.7508 | 15 |
| 28 | Construction industry | Building construction | 0.5736 | 0.2469 | 0.8205 | 13 |
| 29 | | Civil engineering & special construction | 0.5637 | 0.2585 | 0.8222 | 12 |
| The average of the construction industry | | | 0.8213 | | | |
| The average of the entire industry | | | 0.7359 | | | |

With the input of the complex creation cost in the generation project of the Sangpyeong General Industrial Complex, the firsthand and secondhand value-added ripple effects on the regional economy was identified as a scale of 272.8 million dollar.

In particular, it was revealed that the ripple effects of the building construction according to the creation cost of the government complexes amounted to about 142.49 million dollar, the ripple effects of civil engineering and special construction according to the infrastructure, and the expansion cost of support facility reached about 94.42 million dollar.

Also, with the input of the complex creation cost in the generation project, the firsthand effects in Gyeongsangnam-do amounted to 99.61 million dollar in the building construction, and 64.74 million dollar in civil engineering and special construction, which reached 164.35 million dollar in total, while the secondhand ripple effects were a scale of 72.56 million dollar in total.

Table 10. Value-added Ripple Effects

(Unit: million)

| Division | Value-added Ripple Effects | | |
|----------------------|----------------------------|---------------------------|-------------------|
| | Firsthand Ripple Effects | Secondhand Ripple Effects | The Total Effects |
| Multiple Office Town | 99.61 | 42.88 | 142.49 |
| Support Facility | 64.74 | 29.68 | 94.42 |
| Total | 164.35 | 72.56 | 236.91 |

3) Income-Induced Coefficients

The mean value of the income-induced coefficients in the construction sector was 0.1785, which was lower than mean 0.2639 in the whole industry. In particular, the industry, which was the highest in the income effect was petroleum and coal (0.7005, first place), which was followed by gas and water (0.5463, second place), electricity and electronic equipment (0.4434, third place). In particular, among the construction sector, building construction placed 17th and civil engineering and special construction placed 18th.

Table 11. Income-Induced Coefficients

| No | Industrial sectors | | Direct | Indirect | Aggregate | Ranking |
|----|--------------------|--|--------|----------|-----------|---------|
| 1 | Other Industries | Products of agriculture, forestry, and fisheries | 0.0488 | 0.0967 | 0.1455 | 22 |
| 2 | | Mine products | 0.0373 | 0.1283 | 0.1656 | 20 |
| 3 | | Beverage and food | 0.1294 | 0.0866 | 0.2160 | 16 |
| 4 | | Textile and leather products | 0.2456 | 0.1423 | 0.3879 | 8 |
| 5 | | Timber and paper | 0.2603 | 0.1299 | 0.3902 | 7 |
| 6 | | Print& copy | 0.0719 | 0.1052 | 0.1771 | 19 |
| 7 | | Petroleum & coal | 0.5804 | 0.1201 | 0.7005 | 1 |
| 8 | | Chemical product | 0.1827 | 0.1805 | 0.3632 | 9 |
| 9 | | Non-metal & mineral products | 0.1142 | 0.1569 | 0.2711 | 13 |
| 10 | | Primary metal products | 0.2169 | 0.2224 | 0.4393 | 4 |
| 11 | | Metal products | 0.0931 | 0.1906 | 0.2837 | 12 |
| 12 | | General machine | 0.1473 | 0.1540 | 0.3013 | 10 |
| 13 | | Electricity & electronic equipment | 0.2763 | 0.1671 | 0.4434 | 3 |
| 14 | | Precision machine | 0.2715 | 0.1259 | 0.3974 | 5 |

| | | | | | | |
|--|-----------------------|--|--------|--------|--------|----|
| 15 | Construction industry | Transport equipment | 0.2712 | 0.1226 | 0.3938 | 6 |
| 16 | | Other manufacturing products | 0.1491 | 0.1517 | 0.3008 | 11 |
| 17 | | Electricity, gas, and water | 0.5234 | 0.0229 | 0.5463 | 2 |
| 18 | | Wholesale & retail sale | 0.0451 | 0.0508 | 0.0959 | 27 |
| 19 | | Restaurant & accommodation | 0.0835 | 0.0754 | 0.1589 | 21 |
| 20 | | Transport | 0.1241 | 0.1454 | 0.2695 | 14 |
| 21 | | Communication & broadcasting | 0.0593 | 0.0493 | 0.1086 | 25 |
| 22 | | Finance & insurance | 0.0386 | 0.0285 | 0.0671 | 28 |
| 23 | | Real estate & business service | 0.0289 | 0.0270 | 0.0559 | 29 |
| 24 | | Public administration & national defense | 0.0752 | 0.0631 | 0.1383 | 23 |
| 25 | | Education & health care | 0.0416 | 0.0566 | 0.0982 | 26 |
| 26 | | Society and other services | 0.0525 | 0.0792 | 0.1317 | 24 |
| 27 | | Etc | 0.1327 | 0.1163 | 0.2490 | 15 |
| 28 | Construction industry | Building construction | 0.0693 | 0.1100 | 0.1793 | 17 |
| 29 | | Civil engineering & special construction | 0.0502 | 0.1275 | 0.1777 | 18 |
| The average of the construction industry | | | 0.1785 | | | |
| The average of the entire industry | | | 0.2639 | | | |

With the input of the complex creation cost in the regeneration project of the Sangpyeong General Industrial Complex, the firsthand and secondhand income ripple effects on the regional economy were identified as a scale of 54.54 million dollar.

In particular, it was revealed that the ripple effects of the building construction according to the creation cost of the multiple complex town would be about 31.14 million dollar, and the income ripple effects of civil engineering and special construction according to the infrastructure and the expansion cost of support facility amounted to about 20.40 million dollar.

Also, with the input of the complex creation cost in the generation project, the firsthand effects in Gyeongsangnam-do amounted to 12.03 million dollar in the building construction, 5.76 million dollar in civil engineering and special construction, which reached 17.79 million dollar in total, while the secondhand ripple effects were a scale of 33.75 million dollar in total.

Table 12. Income ripple effect

(Unit: million)

| Division | Income ripple effect | | |
|----------------------|--------------------------|---------------------------|-------------------|
| | Firsthand Ripple Effects | Secondhand Ripple Effects | The Total Effects |
| Multiple Office Town | 12.03 | 19.11 | 31.14 |
| Support Facility | 5.76 | 14.64 | 20.40 |
| Total | 17.79 | 33.75 | 51.54 |

4) Employment-Induced Coefficients

When a final demand, 1 unit is generated, the firsthand and secondhand employment-induced effects come out as much as to satisfy the demand in each industry. Employment-induced coefficients are presented with the number of employers/1 billion won.

Accordingly, employment-induced coefficients show how many job positions are able to be generated in the local economy due to the regeneration project in the Sangpyeong General Industrial Complex.

Employment-induced coefficients (17.0634) in the construction sector appeared to be lower than those of the whole industry (17.3343). The industry, which is the highest in the employment-induced effects in the industries of Gyeongsangnam-do, was the products of agriculture, forestry, and fisheries (49.1399, first place), which was followed by restaurant and accommodation (41.6083, second place), and wholesale and retail sale (38.9772, third place). Building construction in the construction sector and civil engineering and special construction appeared to place 9th and 13th respectively.

Table 13. Employment-Induced Coefficients

| No | Industrial sectors | | Direct | Indirect | Aggregate | Ranking |
|----|--------------------|--|---------|----------|-----------|---------|
| 1 | Other Industries | Products of agriculture, forestry, and fisheries | 44.3887 | 4.7512 | 49.1399 | 1 |
| 2 | | Mine products | 5.9857 | 2.9691 | 8.9548 | 26 |
| 3 | | Beverage and food | 15.2609 | 8.3877 | 23.6486 | 6 |
| 4 | | Textile and leather products | 11.0296 | 6.2891 | 17.3187 | 10 |
| 5 | | Timber and paper | 6.7351 | 5.3477 | 12.0828 | 18 |
| 6 | | Print& copy | 15.5282 | 4.9411 | 20.4693 | 8 |
| 7 | | Petroleum & coal | 2.4984 | 2.2321 | 4.7305 | 28 |
| 8 | | Chemical product | 6.7669 | 4.2915 | 11.0584 | 21 |

| | | | | | | |
|--|--|--|-----------------------|---------|---------|---------|
| 9 | | Non-metal & mineral products | 8.1695 | 5.1819 | 13.3514 | 16 |
| 10 | | Primary metal products | 2.5316 | 3.4304 | 5.9620 | 27 |
| 11 | | Metal products | 7.0314 | 4.2917 | 11.3231 | 19 |
| 12 | | General machine | 6.0310 | 5.0390 | 11.0700 | 20 |
| 13 | | Electricity & electronic equipment | 4.4213 | 4.8572 | 9.2785 | 25 |
| 14 | | Precision machine | 7.9566 | 4.7506 | 12.7072 | 17 |
| 15 | | Transport equipment | 6.1303 | 4.0604 | 10.1907 | 23 |
| 16 | | Other manufacturing products | 10.5466 | 6.0298 | 16.5764 | 11 |
| 17 | | Electricity, gas, and water | 1.7672 | 0.7981 | 2.5653 | 29 |
| 18 | | Wholesale & retail sale | 36.0729 | 2.9043 | 38.9772 | 3 |
| 19 | | Restaurant & accommodation | 32.8913 | 8.7170 | 41.6083 | 2 |
| 20 | | Transport | 13.5195 | 2.2622 | 15.7817 | 12 |
| 21 | | Communication & broadcasting | 6.1133 | 4.6922 | 10.8055 | 22 |
| 22 | | Finance & insurance | 10.4210 | 2.9859 | 13.4069 | 15 |
| 23 | | Real estate & business service | 7.8178 | 2.0460 | 9.8638 | 24 |
| 24 | | Public administration & national defense | 10.7792 | 3.6470 | 14.4262 | 14 |
| 25 | | Education & health care | 18.9394 | 2.9826 | 21.9220 | 7 |
| 26 | | Society and other services | 28.1779 | 4.1286 | 32.3065 | 4 |
| 27 | | Etc | 14.9161 | 14.1282 | 29.0443 | 5 |
| 28 | | Construction industry | Building construction | 13.7837 | 4.5678 | 18.3515 |
| 29 | Civil engineering & special construction | | 11.2760 | 4.4993 | 15.7753 | 13 |
| The average of the construction industry | | | 17.0634 | | | |
| The average of the entire industry | | | 17.3343 | | | |

Employment ripple effects in Gyeongsangnam-do, which were identified as the employment ripple effect, were a scale of about 5,757 in people. In particular, the ripple effects in the building construction caused by the creation cost reached about 3,670 in people, while the employment ripple effects of civil engineering and special construction appeared to be about 2,086 in people. In addition, it is expected that firsthand employment effects would be 4,248 in people, while the secondhand employment effects would be 1,509 in people.

Table 14. Employment ripple effects

(Unit: people)

| Division | Employment ripple effects | | |
|----------------------|---------------------------|---------------------------|-------------------|
| | Firsthand Ripple Effects | Secondhand Ripple Effects | The Total Effects |
| Multiple Office Town | 2,757 | 914 | 3,670 |
| Support Facility | 1,491 | 595 | 2,086 |
| Total | 4,248 | 1,509 | 5,757 |

V . Conclusion

Jinju Sangpyeong General Industrial Complex was created in the 1970s, and it was currently designated as the deteriorated industrial complex. For this reason, It was selected as the target area of the generation project by the government in an effort to invigorate the local economy.

In this regard, the Keynesian multiplier theory and the input-output model were used in this study to analyze the ripple effects of the regional economy, influenced by the regeneration project in the Sangpyeong General Industrial Complex.

The findings, obtained from this study are as follows: First, the Keynesian multiplier theory was applied to analyze the multiplier effects across the nation according to the land compensation.

As a result, the ripple effect was derived under the premise of the land compensation on a basis of the publicly notified land price in the project zone for the creation of the Multiple Complex Town. The project zone, where the land compensation is executed in the generation project of the Sangpyeong General Industrial Complex, is the planning lot of the Multiple Complex Town, which accounts for the 53.1% (1,134,000m²) of the industrial complex, and the nationwide economic ripple effects are estimated to be a scale of 1,359 million dollar on a basis of the publicly notified land price as the land compensation of about 339.73 million dollar is spent for the regional economy.

However, on the account that the regeneration project in the Sangpyeong General Industrial Complex was at the initial stage of the plan, definite standards were yet to be set. Therefore, this analysis has a limit in a sense that it only presents the land compensation based on a publicly notified price. Second, regarding the regional ripple effects according to the creation stage of the complex, it analyzed the firsthand and secondhand ripple effects by applying the

input-output model. This study configured two areas; Gyeongsangnamdo, which is inclusive of the research target area, and the other area for the analysis of the economic ripple effects according to the creation stage of the complex.

Among the Inter-Regional Input and Output (IRIO), it readjusted the large-scale classification (28*28) and middle-scaled classification (78*78) in the construction field and composed the construction field into two subdivided parts, which are highly associated with the regeneration project (29*29 sector); building construction, and civil engineering and special construction.

The creation cost of the complex in the regeneration project of the Sangpyeong General Industrial Complex was divided into two; about 114.85 million dollar in infrastructure and the expansion cost of the support facility, about 173.69 million dollar in the creation cost of the multiple complex town. Therefore, it is expected that a total of about 288.54 million dollar will be input. Production ripple effects, value-added ripple effects, Income ripple effects and employment ripple effects were analyzed by applying the input and output model.

The production ripple effects, obtained by the creation cost of the complex were identified as a scale of about 598.42 million dollar. The firsthand production ripple effects were identified as a scale of about 385.14 million dollar, while the second ripple effects appeared to be a scale of about 213.28 million dollar. The value-added ripple effects appeared to be a scale of 236.91 million dollar in total, The firsthand value-added ripple effects were identified as a scale of about 164.35 million dollar, while the secondhand ripple effects were a scale of about 72.56 million dollar. The Income ripple effects appeared to be a scale of 51.54 million dollar in total, The firsthand income ripple effects were identified as a scale of about 17.79 million dollar , while the secondhand ripple effects were a scale of about 33.75 million dollar.

Regarding the employment ripple effects, the employment effects of about 5,757 in people are expected in the regeneration project of the Sangpyeong General Complex. It is expected that the firsthand employment effects will measure up to about 4,248 in people, while the secondhand employment effect will reach about 1,509 in people.

To sum up, the ripple effects of the Sangpyeong General Industrial Complex are judged to be a necessary plan for the invigoration of the deteriorated industrial complex, which is expected

to be significant when the regeneration project is executed. Until recently, there have been a considerable large number of studies on the analysis of the economic ripple effects.

However, it is a situation that the ripple effects on the local economy, which is seen at the stage of the land compensation, has not been sufficiently studied, despite the significant amount of the actual effect. Therefore, invigoration of the local economy, led by the land compensation and the creation of the complex influenced by the regeneration project in the Sangpyeong General Industrial Complex and subsequent economic growth, should be studied further.

References

- Albino, V. (2004). Enterprise input-output model for local sustainable development—the case of a tiles manufacturer in Italy, *Resources-Conservation and Recycling*, 41(3), 165-176.
- Choi, GH. (2009). An Analysis of the Regional Economic Impacts of developing Paju Cultural Industry Complex Development, *Korean Urban Management Association*, 22(3), 171-196.
- Choi, SJ. (2007). A Study on the Effects of Structure Hightening of Seoul Digital Industrial Complex, *HanYang University*.
- Cho, YY. (2008). A Study on the Regional Economic Impacts of Cultural Industry Complex Development, *University of Seoul*.
- Douglas, C. (1999). Estimating the Multiplier Effects of Tourism Expenditures on a Local Economy through a Regional Input-Output Model, *Journal of Travel Research*, 37(4), 324-332.
- Eom, SW. (2010). A Study on the Analysis of Regional Economic Spread Effect induced by the Regeneration Project of Old Industrial Complex, *Journal of the Korean regional economics*, 16, 27-45.
- Eom, SW. And Kim, HY. (2009). A Study on the Analysis of Economic Spread Effect induced by Asan-Bay Development, *Journal of the Korean regional economics*, 13, 71-92.

- Glenn-Marie, L. (1998). Applying an Integrated Natural Resource Accounts and Input-Output Model to Development Planning in Indonesia, *Economic Systems Research*, 10(2), 113-134.
- Han, SL. (2014). Estimating the Economic Impact of Channel Industry using an Inter-Regional Input-Output Model: Case Study of City of Seoul, *KODIA*, 19(3), 27-46.
- Herschel, R. And Omer, F. (1999). Efficient input—output model representations, *Computer Physics Communications*, 117(1-2), 11-20.
- Jin, JG. (2014). An Empirical Study on the Decline of Industrial Parks - Focused on the Industrial Parks Developed by Local Governments, Chung-Ang University.
- Jung, KO. And Lim, ES. (2011). A Comparative Study on Economic Effect of life insurance and indemnity insurance Industry, *Korea Academia-Industrial cooperation Society*, 12(2), 646-652.
- Jung, JE. (2009). A study on Estimating Regional Economic Impacts of Kaesung Industrial Estate Using Interregional Input Output Analysis, Chung-Ang University.
- Kim, NR. And Kim, Y. (2009). An Analysis of Economic Impacts of Urban Regeneration Focusing on Urban Rehabilitation Projects, *Korea Planners Association*, 44(6), 89-103.
- Kim, S. (2014). A Study on Renewal Plans for an Old Industrial Complex, KeiMyung University.
- LEE, KM, Impact Analysis of Cheongju Cultural Industry Park Based on Input-Output Methods, Chung-Buk University.
- Lee, JY. (2007). Impact Analyses of Regional Economies Originated from Chungju Company Town and Hightech Industrial Complex Development, Chung-Buk University.
- Moon, JH. (2011). Estimating the Economic Impact of a Mega-Sports Event Using Inter Regional Input Output Analysis, Kang-Won University.
- Park, JY. And Park, CK. (2010). Constructing the Daegu National Industrial Complex, *Management And Economics Review*, 29(2), 39-57.

Song, HJ. And Lee CK. (2012). Estimating the Economic Impact of Traditional Market Revitalization Project Using Inter-Regional Input-Output(IRIO) Model, KASTM,27(1), 175-193.

Son, MG. (2012). An Analysis on Regional Economic Structure and Regional Industry by the Multi-Regional Input-Output Model, Kyong-Gi University.

Jinju-si(2014) The Report of the Present Conditions of the Jinju Sangpyeong Industrial Complex

Jinju Council. <http://www.jinju.go.kr/> (Accessed March 2015)

Statistics Korea. <http://www.kostat.go.kr/> (Accessed March 2015)

The Bank of Korea, ECSS. <http://ecos.bok.or.kr/> (Accessed February 2015)