Ranking of Financing Methods for Renovation and Improvement of Urban Decay in Khorasgan in Isfahan Province

Narges Mohammad Hosseini  
Master of public-financial management, Khorasgan branch, Islamic Azad University, Isfahan, Iran  

Homayoun Ranjbar  
Assistant professor, Department of Economics, Khorasgan branch, Islamic Azad University, Isfahan, Iran  
Email: hranjbar@khuisf.ac.ir  

Mohammad Alimoradi  
Faculty member, Islamic Azad University, Khorasgan branch, Islamic Azad University, Isfahan, Iran  

Mahnaz Mohammad Hosseini  
Department of Management and Accounting, Najafabad Branch, Islamic Azad University, Isfahan, Iran  

Abstract  

Financial resources are regarded as driving engine of economic activities and implementing investment plans is not possible or is faced with problem without financial resources or not predicting or planning to supply them. Given to diversity and extensiveness of financing methods and resources, choosing the best option is often a difficult task and decision making about it requires considering several factors such as beneficiaries and cultural and social conditions. Financing for renovation and improvement of urban decay includes various methods. In the present survey, the most important financing methods for renovation and improvement of urban decay and effective standards on choosing an appropriate financing method were exploited through historical study and field study. Therefore, preferences of investment and financial experts through paired comparisons of standards and financing methods with regard to each research standard were exploited using a questionnaire designed based on Analytical Hierarchy Process (AHP). Then relative weights of effective standards and financing methods with regard to each research standard were calculated using AHP method and data related to paired comparisons was extracted from the questionnaire. Final weight of financing methods in terms of research standards or in other words ranking of the applied financing methods in the survey were determined by merging the obtained relative weights. According to results, the most important financing methods for renovation and improvement of
urban decay in Khvorasgan in Isfahan province include bonds, metric sales, project shareholder, banking facilities and investment method of the private sector. Main effective standards contain lower risk, higher rate of return, more participation of the private sector, lower financial expenses, lower cost of financing and more ceiling of cash financing. Ranking of standards reveal the most important standards according to financial and investment experts are higher rate of return, more participation of the private sector and maximum amount of financing with relative weights of 0.420, 0.281 and 0.157 and three standards related to lower costs and risk have relative weights and thus relative importance. Among the above-mentioned financing methods, research results recommend two methods of bonds and investment of the private sector with final weights equal to 0.314 and 0.267 respectively. Three methods of project shareholder, metric sales and banking facilities obtained lower final weights.

Keywords: financing, participation, improvement and renovation, urban decay, Analytical Hierarchy Process (AHP)

Introduction and statement of problem

Economic renovation means prosperity of suitable and coordinated economic activities either to reinforce the current activities or to attract new economic activities that is regarded as a considerable and significant strategy. Urban centers and contexts that have been forgotten or are being forgetting can be revived through economic renovation of old contexts and urban centers. The first issue proposed in this regard is how to finance (Jafarzade & Jannati, 2010: 526). According to latest estimations by the Tehran City Renovation Organization (2011) total volume of urban decay in Iran is 65000 hectares. Costs of developing the substructures of urban decay have been estimated 100 billion Rials per hectare and the required time to do this through the current process of resource allocation and disregarding decay growth has been regarded 78 years. Comparing costs of developing the substructures of urban decay with some macro-economic indexes reveals enormous capital required for renovation and improvement of urban decay more than ever. According to estimations by the Tehran City Renovation Organization (2011) the required capital is five times the general budget of the government in 2011 and 59 times total budget of municipalities in 2009. This shows supplying the required capital is not possible by none of the government sectors, municipalities and the private sector alone. It requires extensive utilization of financial instruments through financial markets channel which reveals the necessity of more and more participation of the public and private sectors.

The most important financing methods and various types of their classification that can be applied for renovation and improvement of urban decay with operational experience in metropolises were studied in the present paper to determine the priority of each method regarding research standards besides better recognition of methods. Moreover, final weight of financing methods with regard to research standards can be achieved by merging relative weight of methods with regard to each research standard. Indeed, it is determined that each method is to what extent capable of satisfying the needs of urban decay in terms of financing given to the whole standards. In the present survey, the most important financing methods for renovation and improvement of urban decay and effective standards on choosing an
appropriate financing method were first exploited through historical study and field study. The most important financing methods include bonds, metric sales, project shareholder, banking facilities and investment method of the private sector. The major effective standards contain lower risk, higher rate of return, more participation of the private sector, lower financial expenses, lower cost of financing and more ceiling of cash financing. Evaluation was carried out through hierarchical method and paired comparison among the standards. Conclusion and recommendations were presented in the last section.

Effective factors on creating urban decay

Harmful factors or erosive and destructive factors of urban buildings and spaces are highly diverse and extensive. Factors related to decay of buildings and urban spaces are generally classified into two classes of natural environment and human or human environment factors (Ghorbanian, 2011: 77).

Natural environment factors

There are various types of natural environment factors some of which are mentioned briefly below: 1) type of whether and climatic elements such as temperature and especially temperature difference 2) rainfall and especially heavy rainfall 3) moisture especially humid air that affects erosion and damaging the urban structure; freezing affects physical destruction, sunlight affects achromatizing and wind and raining are effective on destruction and achromatizing the appearance and structure of elements and urban spaces. Generally, climatic factors affect skeletal-spatial structure of cities.

Human factors

Human being and his activities are the most important factor of decay and destruction of buildings and urban spaces that can be studied in three groups:

1- social factors
2- economic factors
3- skeletal-spatial factors

1- Social factors

These factors include:
Inharmonious and unbalanced dispersion of population density and population per capita
Unawareness of residents of urban fabrics from their historical-cultural values
Inharmonious and unbalanced modernization and renovation in urban sectors
Changing of household pattern from extensive to nuclear
Old or very young population structure
Displacement of social groups and classes
Psychological dimensions of restoration measures
Reduction of social security (Ghorbanian, 2011)
2- Economic factors

Protecting the whole urban areas requires development of social and economic aspects especially in urban renovation and reconstruction that unlike improvement is the dominant aspect of development. It must be operationalized using economic leverage and supplying reasonable profit.

The most important cases that are considered as economic damages of old urban fabrics are:

1- Unfavorable status of employment and income and thus financial and economic inability of residents
2- Situation and economic value of land
3- Change of consumption pattern
4- Inharmonious and unbalanced investment in construction affairs
5- Urban rates and taxes: received prices by the municipality entitled renovation rates and taxes are similar almost across the whole city.
6- Weak cooperation of economic and cultural institutions in economic-social development of old texture: Execution of unique urban management is the first step in maintaining and renovating the historical contexts of cities successfully. Constitution of local associations and neighborhood unit is essential for economic cooperation in old textures (Ghorbanian, 2011).

Summary of economic problems of urban decay are as the table 1.

Table 1- economic problems of urban decay

<table>
<thead>
<tr>
<th>Economic problems of urban decay</th>
<th>Reasons of this problem and its consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak economic value of land and housing</td>
<td>Land is the only property of owners due to skeletal decay of buildings which does not have much value because it is situated in urban decay and thus decreases destruction and innovation rate.</td>
</tr>
<tr>
<td>Increased maintenance expenses of building</td>
<td>In many cases owners can not maintain the building due to issues such as type of the structure and architectural plan and they have to leave the building because of not using it.</td>
</tr>
<tr>
<td>Reluctance of the private sector to invest</td>
<td>According to theory of public goods, investment in urban decay is accompanied by low profit and long-term capital return from one side and renovation of these contexts requires extensive investments from the other side.</td>
</tr>
<tr>
<td>Residence of low-income families</td>
<td>Low-income strata replace residents with more appropriate economic status and this is led to poverty concentration.</td>
</tr>
<tr>
<td>Stagnation of firms' activity</td>
<td>Activity of firms becomes stagnated and even closed and thus it is resulted in unemployment and intensive poverty.</td>
</tr>
</tbody>
</table>

Source: Hassanzade, 2011
3- Skeletal factors

Effective skeletal factors on decay and destruction of buildings in urban spaces are as the following:
1- Intensive decay of the existing buildings in the old context
2- Problems related to roads network
3- Uselessness of some old elements of cities
4- Density and consistency of texture: vicinity of valuable buildings with dilapidated and obsolete buildings incurs skeletal damages to old and valuable buildings. Dealing with historical context in cellular form due to its consistent nature might disturb urban order because of investigatory negligence in considering economic aspect of project.
5- Problems related to type of residential buildings
6- Problems due to the applied materials and manner of repairing
7- Environmental problems
8- Lack of urban and substructure services, installations and facilities

Financing and various types of its methods

By financial resources we mean resources that are obtained using financing instruments either directly (in cash) or indirectly. Purpose of the financial system is indeed to create a reasonable relation among investors and those who need financing (investee). These methods are finally converted into capital which necessitate obligations and considerations that are different given to the type of approach and the intended product, since they are the most important factor in the implementation process of urban decay renovation. Hence, no one is superior over the other and residents' needs can be planned and allocated just after adequate recognition (Dargahi, 2007).
Different types of current financial resources in Iran can be classified as the below table based on consumption, mechanisms and type of investors.
Financing is regarded as a powerful element for financial institutions and is among the important factors in deepening the financial system. For this reason, various financing methods have been proposed in the world. Three types of classification of financing methods mentioned in Nevitt and Fabozzi (2000) and Jamali and Naraghi (2010) studies are as below:

1. Classification of financing methods based on nature

2. Classification of financing methods based on financial systems

In temporal terms, the short-term period in financial management is usually related to debts that their maturity date is less than one year. But long-term financing has not been defined precisely. Some economic units apply middle-term for maturity dates more than one year and less than ten years (Saleh, 2010).

1- Classification of financing methods based on nature

Classification of financing methods based on nature contains methods and mechanisms which create a basis to attract financial resources, determine manner of payments and repayments and identify obligations and circumstances that govern financing. Thus, financing methods include three kinds of financing techniques including project, corporation and structured.

2- Classification of financing methods based on financial systems

Money market, capital market and insurance market are three major elements of financial markets. These three elements are the driving engine of supplying financial resources and economic growth of each society that each one has a special role. Money market is appeared in activities of banks and credit institutions that are main players of this market. Capital market and insurance market are manifested in the stock exchange and insurance industry of each country respectively.
Through studying financial structure of countries it is perceived that financial structure of each country can mainly be based on two axes of money market or capital market and there are two classes of financing methods according to that:

1- Equity-based financing methods

Equity-based financing requires assignment of a portion of the project profit against receiving the capital. Funds brought by suppliers of financial expenses are spent to perform project activities and the obtained profit is distributed totally among these suppliers in future. The most important step in this method is to encourage investors to participate in the project (Jafarzade & Jannati, 2010: 529).

Major equity-based financing methods which are highly used in renovation and improvement of urban decay and in metropolises are as below:

- Project shareholder
- Metric sales
- Investment of the private sector
- Converting the assets into securities

2- Debt-based financing methods

Another financing resource is to use debt. Debt-based financing methods mean getting a loan from a resource outside of the company with agreement of the company owners. It is hoped that through these resources the obtained profit by conducting the project is more than the amount that should be returned to lenders as interest.

The four following methods can be used to help supply financial resources of projects in urban decay:

- Bonds
- Foreign investment
- Using foreign financial facilities
- Deposit system and granting facilities

Given to the required high capital for renovation and improvement of urban decay and based on previous experiences in municipalities in metropolises, banks in our country are faced with limitations of attracting deposit and granting loan and banking system of the country can not finance the intended capital in this sector (Bahmani & Ghaffari, 2007: L 3). Using foreign financial facilities and foreign investment have not been much considered due to their time-consuming process and existence of some limitations to attract capital, since using these methods given to Bahrololumi and Karvar's studies (2010) is affected by political, incentive and supportive factors, economic structure and economic policy-making of the country which receives cash funds. Therefore, given to domestic conditions in Iran using these two methods has limitations.

**Methodology**

Analytic hierarchy process (AHP) as a quantitative analysis method, which is based on paired comparison, was used in this survey to study and choose the most important standards and determine how to choose financing methods. AHP process is a flexible, strong and simple method which is applied for decision-making under conditions where opposite decision-making standards create problems in choosing among the options (Zebardast, 2002). As it was
mentioned earlier, this method enhances precision and simplicity in choosing the determinant standards through the possibility of paired comparisons. This method includes three main steps: A) creating paired comparison matrix, B) calculating standard weights and C) estimating the ratio of agreement. In this technique, hierarchical structure of the problem is made and then relative weight of each index is determined through paired comparison among the standards and sub-standards under study. Afterwards value of each case study is calculated given to the obtained weight.

**Conceptual model of the survey**

The main research model is depicted in the form of a hierarchical tree which includes three levels of purpose, standards and options. Major purpose of this survey was to rank financing methods, i.e. research options. Standards are effective factors on choosing an appropriate financing method and options are financing methods for renovation and improvement of urban decay.

**Figure 2- Hierarchical tree**

**Findings**

Generally, ranking of financing methods for renovation and improvement of urban decay was the purpose of this survey. Preferences of experts, incompatibility rate in paired comparison of standards and options with regard to each research standard were calculated after merging of paired comparisons' tables using geometric mean. Having ensured nonexistence of incompatibility, standards and financing methods (options) were ranked and their relative importance was determined. Final weights or ranking of financing methods (options) was obtained by merging relative weights. Then sensitivity of options' behavior with regard to a certain percentage of change in relative weights of standards was analyzed at three levels. Obtained results are discussed in this section.

Primary question 1: What is the relative importance of each effective standard on choosing financing methods for renovation and improvement of urban decay?

Incompatible rate of paired comparison tables of standards, sub-standards and options were obtained after merging respondents' preferences considering weight of experts' opinion using geometric mean. Incompatible rate of table was less than 0.1, thus results are reliable and relative weights can be exploited. Higher rate of return with relative weight equal to 0.420 was the most important standard and was ranked first. Rate of return has the first priority in most economic activities, because people intend to maximize profit and return. Here higher return was regarded by authorities as the first factor and it is important in choosing a suitable financing method considering rate of return as the most important standard. Higher rate of profit than interest rate with relative weight of 0.614 has the first rank among sub-standards, since whatever rate of profit is higher than the interest rate, the private sector transfers its deposits to participatory projects instead of depositing its saving in banks. Afterwards, higher rate of return due to the type of investor and higher repayment period with relative weights equal to 0.268 and 0.117 are ranked second and third among sub-standards of higher rate of return. More participation of the private sector with relative weight of 0.281 is ranked second,
i.e. the second effective standard on choosing financing methods is more participation of the private sector with relative weight of 0.281 which requires participation of the public sector with the private sector due to enormous intended capital. High ceiling of cash financing with relative weight of 0.157 is ranked third among the effective standards on choosing financing methods. Lower financing standards, lower cost of financing and lower risk with relative weights equal to 0.067, 0.043 and 0.033 are ranked fourth, fifth and sixth. Optimal allocation of risk in sub-standards of lower risk with relative weight of 0.8 has a high importance and shows policy-makers and financial experts seek to choose methods with optimal allocation of risk among the public and private sectors. Risk of access to fewer funds with relative weight of 0.2 is ranked second among sub-standards of risk standard. Financial experts do not pay much attention to financial expenses and costs of financing, because they have often been supported by the public and governmental sector. Comparison of relative weights shows relative weights of the first three factors including higher rate of return, more participation of the private sector and higher ceiling of cash financing have been determined as the most important effective standards. Three standards of risk, financial expenses and cost of financing reveal less importance of these standards in choosing financing methods. Ranking of sub-standards related to cost of financing demonstrates two sub-standards of expenses in terms of Rial and temporal expenses have equal relative weights and have a similar impotence in view of financial experts.

Table 2-4 Relative weights of standards and sub-standards

<table>
<thead>
<tr>
<th>Index</th>
<th>Relative weight</th>
<th>Rank</th>
<th>Sub-standard</th>
<th>Relative weight</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher rate of return</td>
<td>0.420</td>
<td>1</td>
<td>Higher rate of profit than the interest rate</td>
<td>1</td>
<td>0.614</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Higher rate of return due to type of investor</td>
<td>2</td>
<td>0.268</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Longer repayment period</td>
<td>3</td>
<td>0.117</td>
</tr>
<tr>
<td>More participation of the private sector</td>
<td>0.281</td>
<td>2</td>
<td>____</td>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>Maximum ceiling of cash financing</td>
<td>0.157</td>
<td>3</td>
<td>____</td>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>Lower financial expense</td>
<td>0.067</td>
<td>4</td>
<td>____</td>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>Lower cost of financing</td>
<td>0.043</td>
<td>5</td>
<td>Lower expenses in terms of Rial</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Less temporal expense</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Lower risk</td>
<td>0.033</td>
<td>6</td>
<td>Optimal allocation of risk</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower access risk</td>
<td>2</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: research findings

Primary question 2: What is the relative importance of financing methods for renovation and improvement of urban decay with regard to each standard?
First, tables are normalization after experts' preferences about comparisons of options with regard to each standard are merged and then relative weights are obtained based on AHP process. Incompatibility rate of tables was examined too. As this rate for all tables was less than 0.1 relative weights of options were exploited with regard to each standard. The obtained results are shown in Table 2.

Ranking and relative weight of financing methods with regard to each research standard are shown in Table 2.

Primary question 3: What is the final weight of financing methods for renovation and improvement of urban decay with regard to all standards?

Final weight or in other words final rank of financing methods were obtained after merging relative weights of standards and financing methods that are observed in Table 3.

Table 2- Ranking of financing methods with regard to each research standard

<table>
<thead>
<tr>
<th>Financing methods</th>
<th>Lower risk</th>
<th>Lower cost of financing</th>
<th>Higher rate of return</th>
<th>Maximum ceiling of cash financing</th>
<th>More participation of the private sector</th>
<th>Lower financial expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relative weight</td>
<td>Rank</td>
<td>Relative weight</td>
<td>Rank</td>
<td>Relative weight</td>
<td>Rank</td>
</tr>
<tr>
<td>Investment of the private sector</td>
<td>0.448</td>
<td>1</td>
<td>0.38</td>
<td>2</td>
<td>0.24</td>
<td>4</td>
</tr>
<tr>
<td>bonds</td>
<td>0.252</td>
<td>2</td>
<td>0.06</td>
<td>6</td>
<td>0.31</td>
<td>3</td>
</tr>
<tr>
<td>Project shareholder</td>
<td>0.178</td>
<td>3</td>
<td>0.17</td>
<td>9</td>
<td>0.11</td>
<td>4</td>
</tr>
<tr>
<td>Metric sales</td>
<td>0.081</td>
<td>4</td>
<td>0.20</td>
<td>6</td>
<td>0.10</td>
<td>7</td>
</tr>
<tr>
<td>Banking facilities</td>
<td>0.032</td>
<td>5</td>
<td>0.16</td>
<td>7</td>
<td>0.22</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: research findings
Table 3- Ranking of financing methods in terms of all research standards

<table>
<thead>
<tr>
<th>Financing methods</th>
<th>Final weight</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment of the private sector</td>
<td>0.314</td>
<td>1</td>
</tr>
<tr>
<td>bonds</td>
<td>0.267</td>
<td>2</td>
</tr>
<tr>
<td>Project shareholder</td>
<td>0.169</td>
<td>3</td>
</tr>
<tr>
<td>Metric sales</td>
<td>0.150</td>
<td>4</td>
</tr>
<tr>
<td>Banking facilities</td>
<td>0.100</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: research findings

Secondary question 1: What are major effective standards on choosing an appropriate financing method?

Historical study and field study were used to choose effective standards in order to select appropriate financing methods for renovation and improvement of urban decay. First, the intended standards were selected based on historical study and then they were modified and reviewed on the basis of experts' views. The most important effective standards for choosing appropriate financing methods for renovation and improvement of urban decay included higher rate of return which was constituted of three sub-standards, i.e. higher rate of profit than the interest rate, higher rate of return due to the type of the investor and longer repayment period. Also other standards included more participation of the private sector, maximum amount of financing, lower financial expenses, lower cost of financing that contains two sub-standards of lower expenses in terms of Rial and lower temporal expenses. The last standard is lower risk that consisted of two sub-standards of optimal allocation of risk and lower access risk.

Secondary question 2: What are major financing methods for renovation and improvement of urban decay?

Financing methods that can be applied for renovation and improvement of urban decay were exploited after conducting historical study and field study. Then main methods were selected based on their operational experience in cities and also according to financial experts’ views. Financing methods under study in this survey included investment of the private sector, bonds, project shareholder, metric sales and receiving bank facilities.

Discussion and conclusion

Supplying financial resources as the most important element to implement urban plans and projects enjoys extensiveness and diversity, at the same time there are various limitations for each one of these methods. This requires necessity of considering the best method to achieve maximum return. One of the problems in renovation and improvement is permanent changes of the plan that are the major obstacle for investment and participation of the private sector and are led to lack of confidence in this extensive national plan. This issue is an obstacle for
accurate transfer of information too. Changes in projects' limits and public places are related to usage, densities, etc that authorities should consider it exactly. Results reveal investment method of the private sector with final weight equal to 0.267 is ranked second in the prioritization of financing methods. On the other hand, given to advantages of this method and its high rank than other standards it is essential to pay more attention to this financing method. Accurate and timely information about conditions of plans is one of the major preconditions to utilize the private sector resources whether in investment form or participation of owners. Advertising and information is one of the affairs for which no appropriate investment has already been allocated. It can be stated that it is one of the main problems in renovation and improvement plans and eliminating it towards supplying the resources will highly be useful. Research results indicate the most important standard is higher rate of return to attract participation of the private sector. Therefore, it is essential to consider rate of profit in financing methods so that capitals of the private sector are attracted towards profitable urban plans instead of investment in banks. This has both economic interests for them and causes to establish a more beautiful and healthier city and offering more and higher quality services. Despite governmental authorities acknowledge the importance of implementing this plan, government assistance is very low and governmental facilities cannot be used easily through the related regulations. As results showed, the best method for renovation and improvement of urban decay was through bonds. Hence governmental authorities should consider this issue and provide the necessary facilities to offer bonds by reduction of temporal expenses.

The following can be referred as executive recommendations of the present survey:
Eliminating the current obstacles in order to utilize governmental aids and supports
Accurate and timely information and advertisements
Diversification of financing methods
Security of investment and offering essential guarantees
Providing strategic plans of financing with legal and executive mechanisms at local, national and international levels due to the potentials and conditions of urban decay
Providing necessary circumstances for participation of owners

References

Hasanzade, M. (2011). *Methods to supply financial resources for renovation of urban decay in Iran* (Master's thesis on urban designing, Department of Arts and Architecture, Islamic Azad University, Research and Sciences branch)
SabetiSaleh, Elham. (2010). *Proposing a fuzzy multiple-choice decision making model to rank applicant corporations of banks' financing*. The First International Conference on Developing the Financing System in Iran. Center for Technology Studies in Sharif University of Technology
Zebardast, E. (2002). *Applying hierarchy process in urban and regional planning*. Fine Arts Journal, 10