A Comparison of Influential Indexes in Classification of Urban Projects of Tehran Municipality with other Selected Cities

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Abstract: Undoubtedly, the manner of financing for intended projects depends on the features of each project in any level of existing organizations; therefore, defined and applied indexes and standards should be fitted and overlapped with characteristics of each project. In fact, each project is categorized based on its qualities and appropriate financial instruments are determined according to this criterion. Urban projects have been classified and effective factors on the categorization in urban projects have been identified in this article. Tehran Municipality is compared with some large cities, in this respect. In order to study the issue, equality of external financing of urban projects with transport missions, urban services, and other missions have been examined by using ANOVA analysis, according to the separation of municipal projects to different missions. Better financing can be obtained by better identification and emphasis on the qualities of urban projects of Tehran Municipality and its comparison with other selected cities in the world including Seoul, Shanghai, Kuala Lumpur, New York, London, and Istanbul. According to the results, the hypothesis of equivalent amount of external financing municipal projects with municipal service mission in Tehran and other intended cities is not rejected.

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1- Introduction

Familiarity with types of projects applied in an organization and those enjoying necessary capability for their achievement can be useful in determining the manner of approaching to the job and the degree of required planning and qualification development of the organization. Developing organization's qualifications gives us essential information and acquaintance through what is necessary for applying the management of the project regarding necessary individual and group's qualifications for following organizations' mission. Generally, definable investment projects are identified in the following three categories:

Category I: Only projects that lead to the production of public goods in urban areas such as roads and accesses, public and green spaces: These projects are not justifiable economically and financially, and they are considered as non-profit ones.

Category II: projects that their productions are residential, commercial, administrative, and service units and so on: economic and financial justification of these projects is obvious according to their origins and it requires no proof.

Category III: projects encompassing the implementation of part of required networks, streets, and public spaces in addition to the production of residential, commercial, and service units: most of advisors' defined projects and those implemented by the government, municipalities, and investors are in this category. The cost of implementing the nonprofit sectors has been considered from governmental sector revenue; moreover, the intended profit has been obtained (Aeini, 2010).

Urban projects are those that have close and essential relationship with life and framework of the city and there is a mutual dependence and continuity and social attendance between these projects and the city. This indicates these projects develop in accordance with citizens' needs and urban environment; therefore, urban and non-urban projects should be separated in order to specify responsibility framework, scope of operation, and intervention of city management planning in the field of implementation of the projects. Thus, urban projects are firstly required for citizens and dependent on the city and secondly such projects improve and keep spatial variety, mobility extension, and social attractions. Generally, urban projects can be classified into two forms:

1- Infrastructure services based on urban facilities and equipment

2- Welfare and social services based on social infrastructures

In this regard, infrastructure services are referred to all urban services that are necessary for continuity of urban life including services of water supply and electrification, garbage collection and sewage, communication, transportation etc.

According to the definitions of urban projects, social and environmental issues are of great importance in these projects. Only economic issues and return on investment is important for private sector in order to enter into every domain. In other words, private sector would not care about other indexes such as social, cultural, and environmental ones. The

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only criterion is the economic dimension, but production of the mentioned projects is the issue in public sector. Such projects have features encompassing social benefits. Issues such as social, cultural, and environmental affairs exist in such projects and they are considered in them. Mentioned impacts are entitled as positive overflows and they are good reasons for implementation of the projects by municipalities in the economic literature.

The entity of the projects refers to the point that product derived from a project are classified in the realm of pure public, gross public or private goods. The criterion is used to be that if a commodity is pure public and there is no possibility of making money even by selling advertisements, financial tools should be applied that use subsidies directly. If there is a project in gross public row, there may be revenue from tariffs and duties for it. Thus, proper financial tools are considered with this feature. Projects related to private good are determined according to the type of project technically (entry of technology), economically (ROI, economic risk, etc.), and financial tools.

Implementation level is another criterion to measure the extent of the consequences of a project. In other words, what area can be influenced by its product if a project is implemented in the level of a city? Are their effects limited at the level of the neighborhood such as park or it can influence on national scale too?

The volume of financial resources is another important index. For example, according to the costs for absorbing resources, if the amount of capital is classified for small-scale projects and use of external resources does not have privilege to internal resources, it will not be appropriate in this field. The other variable that can be considered as one of the features of the project is the time of exploitation i.e. how much time is needed to exploit a project. The index refers to two main and important variables in investment implicitly i.e. ROI and economic risk in the time of project exploitation. It has been tried in this article to compare influential indexes in categorization of Tehran's urban projects with other selected cities in the world such as Seoul, Shanghai, Kuala Lumpur, New York, London and Istanbul by better identification and emphasis on the features of urban projects in Tehran Municipality.

2- Literature Review

A few studies have been done about financing and urban projects in Iran, which we will refer to some of them in the following:

Sharzeie and Majed (2011) studied the manner of financing in order to achieve sustainable development. The results indicate that a major part of revenues obtained by municipalities is not compatible with the concepts of sustainability and desirability. Sustainable resources such as renewal dues, tax on properties and revenues from services have been relatively neglected. Unsustainable revenues such as dues for selling density, dues on construction violations, and fines regarding Article 100 have been increased. This can institutionalize municipalities' reliance on unsustainable revenues in long term. If it

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happens, achievement to urban sustainable development will be impossible. Thus, in order to have sustainable revenues, it is necessary to define the entity and manner of forming items of income at first, and then they should be measured with sustainability criteria.

Lotfalipoor et.al. (2010) studied the most important different methods of funding projects near Holy Shrine of Imam Reza, and they assessed the weaknesses and strengths of these methods. The reasons of success or failure of each method was analyzed in the article and finally successful strategies in financing the projects were explained.

Heshmati Molayi in an article entitled "new methods of financing for rehabilitation of distressed areas" states that the major problem is the issue of financing for rehabilitation of these contexts due to more than 60 thousand hectares distressed areas in the country. International limitations and limited access to financial resources and domestic investment are some of them. In addition, the function of such new financial tools has been categorized in the framework of money markets and terms of use for each of them have been stated regarding the rehabilitation of urban distressed areas considering Islamic criteria.

Qasemi (2005) studied the strategies of financing urban subway projects in Shiraz in an article. The estimations based on traditional methods of used capital budgeting, and Monte Carlo simulation have been used to assess the project financially in this research indicate lack of their financial justification (research center of Sharif technology, 2007).

Jafarzadeh and Jannati (2010) studied the financing of renovation and rehabilitation of distressed area around the Holy Shrine of Imam Reza (A.S) through participating bonds. Even though participation bonds have been considered as an almost successful experience of financing in absorbing part of required financial resources in city management system for construction and infrastructure projects as well as governmental and non-governmental urban projects by municipalities, their threats and shortcomings should be considered along with their opportunities and merits. The experience of nine-step publishing of participation bonds, absorbing about 6280 billion Rials of public investment during last 15 years around Holy Shrine of Imam Reza, and their demerits and threats along with advantages have been studied in this research after introducing participation bonds and renovation and rehabilitation plan of this context.

Abdeh Tabrizi (2007) studied the financing methods of business-office, and residential project of Majd-Mashhad. Financing methods have been divided into two methods; capital-based and debt-based.

Jebel Ameli et.al. (2009) in an article entitled presenting a BOT model in order to assess the risk of projects based on risk cycle of the project emphasized on the approach of "build, operation, and transfer (BOT)" as a comprehensive method for designing, construction, management on the profit of the project achieving by the help of domestic and foreign investors of private sector.

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X Zhihua Zeng (2002) studied development in financial sector and financing system particularly in housing sector in an article entitled "reconstruction of housing financial system in the cities of China." It has been noted that financing of housing was allocated through administrative tools by the government before 1980, but financing method was transferred to market mechanism by changes. In fact, after reconstruction, two types of financial institutions have been started including general financial institutions and specialized ones. Funding system of housing is financed by official financial institutions (department of economic studies of Mashhad Municipality, 2010).

Several conferences can be mentioned in the literature review. One of the most important of them is international conference on development of financing system in Iran in 2008. Some of articles that are most related to this research are "a study of new financing methods of projects" by Eslami Milani and Esmaeili, "financing tools and institutions in urban projects" by Nasiri, and "an approach to the role of foreign direct investment in the process of economic growth and financing of developing countries (case study: Tehran Municipality) by Piri.

3- Theoretical Principles

A project is a set of activities done by using time, human, and financial resources to achieve a pre-determined goal; creating a product, service, or unique result. Regarding the purpose of the project, it should be noted that projects are often focused on goals that are realized sooner compared to late achievement aims. Therefore, the purpose of the project is directing resources and planning methods to achieve the particular goals. The main elements of the project definition that sometimes are used in Persian instead of the words map, program, and plan work are used in Persian can be explained as follows:

Temporary: a project is a temporary endeavor with determined end. In other words, a project has a relatively defined temporal sequence for activities related to inputs and outputs. A set of homogeneous activities covering a/some purpose (es) during a determined time and with a specific credit based on feasibility studies of technological-economic or technological-social.

Temporary nature of projects indicates a clear end and beginning. It does not necessarily mean short period rather it monitors specifies the duration of the project and it is not usually applicable about the product, service, or created result by the project. Its results will remain for a long time. Social, economic, and environmental effects of the projects last far more than the projects themselves (Rezazadeh, 1991).

Unique: final product of each project is a unique product, service, or result. It may be repetitive elements in some project outputs like office buildings with same or similar materials or being built by the same group, but the repetition does not change its uniqueness.

Identification and Classification of Urban Projects

Generally, appropriate indexes with the subject are necessary to be considered

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for classification of urban projects. It is obvious that selecting an index reflects the difference of implemented projects. Moreover, desirable features of indexes will depend greatly on the adopted approach and the nature of the project. Therefore, determining appropriate indexes is an important part of the research and planning process. Table1 defines each of the features in details.

Table1. The features of indexes of urban project

Features	Definitions
Measurable and unambiguous	Indexes should be defined so that their measurements and interpretations should not be ambiguous. They should produce objective data. It is not important who collects data. The indexes can be compared among groups and projects to consider changes.
Accessible and sensitive	The indexes should be accessible and sensitive to changes that the project creates.
Related and easily found	Data collection about selected indexes should be possible within a reasonable time and cost. They should be related to the intended project.

Source: (Rezazadeh, 1991)

Considering the features in table1, criteria that can be used to classify urban projects include:

A- The nature of the product or service resulting from the project

It is obvious that the primary objective of the organizations is maximizing the profitability in a given period. In addition, the generally accepted rule is that the major activities of organizations are related to profitability organized in the form of projects. Therefore, the benefits of each financial tool that is applied for financing each project should be more than costs. However, private sector selects considering the features of financial tool and calculating benefits and costs. How can non-governmental bodies such as municipalities select a project except the index of profitability? To answer the question, the type of presented commodities by private sector or municipality should be considered at first since private sector presents products that have price and it selects based on price, production rate, and financial tools that cover the level and production. The goods presented by municipality do not have price and they are not classified as private sector's goods. In economic terms, these goods fall in a row of public ones. In general, public goods lack two features of private goods i.e. competitiveness and separability. Competitiveness means consumption of private good by a person prevents concurrent use by others. Separability means a person who is the owner of a commodity can deprive others of it, but these constraints cannot be imposed on public goods. As a result, the consumption of each individual cannot be recognized and distinguished according to lack of competitiveness and separability, but the issue is completely different regarding public goods that there is no market for them since there is no criterion in this regard and we cannot comment about applying and the type of financial tool for providing resources. In fact, public goods have been emphasized here

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that there is no market for them currently. The stipulation of "currently" has been used since the index of profitability or separability would be significant in future for some of public goods because of advancement in technology. For example, municipal waste that collected by the municipality for many years has been transferred to the private sector. Thus, one of the most important features of that should be considered in the first step is the economic nature of the commodity.

B- Implementation level of the project

One of the other factors that can be influential in the classification of urban projects is considering to the level of implementation and external consequences. The issue that the project implements in what level and the effects of implementing a project to be at neighborhood level or its positive consequences to be at the level of the city or area would be different. This can affect in financing resources and financial supports by different bodies. Types of tunnels and highways that have been considered by municipalities in recent years can be noted at urban level. Types of parks, pedestrian bridges, and green space and so on can be mentioned at the local level. Therefore, each urban project, considering its scale, can be classified into national, urban, and local ones at the level of implementation effects. The classification can clarify the importance of the project in policy-making levels. In other words, when a project is defined at national level, the method of financing resources is different from local project since it is necessary to consider technological changes in a project intended at national level because of its impact on economy, but a local project lacks this quality and its impact is insignificant.

C- The volume of financial resources of urban projects

One of the other issues that have an influential role in the categorization of projects is the volume of financial resources applied in implementation process. This index can be considered as one of the criteria for categorization of projects. In this regard, classification is done about financial resources that should be applied for project implementation.

For instance, according to the costs that exist for absorbing resources, if the amount of capital is classified in small scale, using foreign resources is not suitable in this regard in a condition that it does not have a particular privilege than foreign resources. Therefore, the other factor that can be a proper guide here for classification of projects is dollar or Rial value of the project. Moreover, it can be said that there is no reason that the present generation bear the financial burden of the project alone in large urban development projects that they have long exploitation time and different generations enjoy its advantages. Thus, finding method of these projects should be different with small and with limited resources projects.

D- Duration of project exploitation

The other variable that can be considered as a feature of a project is the time of exploitation. This index implies on two important and major variables of ROI and economic risk in the time of project exploitation in investment. Although ROI is not relevant in projects

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that end in public goods, investment risk can be important in the way of financing.

In this research, urban projects were specified in the budgeting of Tehran Municipality and they are analyzed according to mentioned criteria. Thus, the framework of this part can be explained as follows: firstly, urban projects have been considered based on Tehran municipal budget law. Secondly, each project is classified with respect to the mentioned criteria and the features are studied and tested for each of them.

Classification of urban projects emphasizing on Tehran Municipality budget

Municipal development budget is comprised of two components: revenues and other resources of providing credit and construction costs. Municipal budget is divided into two current and construction parts in revenue part. The current budget devotes to pay salaries, personnel's benefits and a part of institutions and companies of municipality. However, the budget of many municipal activities that have not been defined in the form of program, plan, and project are funded from current budget. This depends on the way of budgeting and administrative system of the municipality. It should be mentioned that the current budget of the municipality has been regulated in the old way of governmental budgeting i.e. 4 chapters and 20 articles.

Municipal construction budget consists of nine main chapters that most of them are the defined missions of the municipality. The chapter headings are respectively as follows: social and cultural mission, transport and traffic mission, urban services mission, safety and crisis management, urbanization and architecture, managerial services, payment of commitments, land acquisition and other issues. The total municipal construction budget was more than 60740 billion Rials in 2010 that 23 percent of it belonged to municipality of districts and 77 percent belonged to the deputies of municipality. Table2 indicates budget division among missions and credits belonging to the deputies and districts according to the budget mission separately (thousand Rials).

Table2. Devoted construction credits to the districts and deputies

Description of the mission	Total credits of districts	The share of total credits of districts	Total credits of deputies	share	Total construction credits of chapter headings	share
Social and cultural mission	3352841690	71	1370600000	29	4723441690	100
Transport and traffic mission	51600182205	21	19082100000	79	24242118205	100
Urban services mission	4589715390	72	1823735000	28	6413450390	100
The mission of safety and crisis management	199705000	16	1060370000	84	1260075000	100
Urbanization and architecture mission	5500000	0	1956700000	100	1962200000	100
The mission of managerial services	650805875	21	2417219240	79	3068025115	100
Payment of commitments	-	0	14082837300	100	14082837300	100
Acquisition of properties	-	0	4500000000	100	4500000000	100
Other issues	-	0	488000000	100	488000000	100
Total construction credits	13958586160	23	46781561540	77	60740147700	100

Source: (Tehran municipal budget, 2010)

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According to table2, 46782 billion Rials from 60740 billion dollars of total Tehran municipal budget in 2010 belonged to deputies and 13959 billion Rials belonged to the districts. The share of construction credits of deputies is more than districts except social, cultural, and urban services missions. Social, cultural, and urban services missions consist of a set of activities with micro nature and the possibility of implementing them is much greater in districts. The mission of transport and traffic has the most share of construction. This is true both in construction credits of traffic and transport in districts, deputies and in total credits of the row. Payment of commitments and mission of urban services are in the next rank. It is noteworthy that payment of commitments is applied through deputies and municipality of districts is not responsible for it. Table3 indicates the share of credits of each budget category heading from the total construction credits in districts, deputies, and total credits.

Table3. The share of budgetary missions from total construction credits (Thousand Rials)

Description of the mission	Total credits of districts	The share of total credits of districts	Total credits of deputies	Share	Total construction credits of chapter headings	Share
Social and cultural mission	3352841690	34	1370600000	2.9	4723441690	7.8
Transport and traffic mission	51600182205	37	19082100000	40.8	24242118205	39.9
Urban services mission	4589715390	32.9	1823735000	3.6	6413450390	10.6
The mission of safety and crisis management	199705000	1.4	1060370000	2.3	1260075000	2.1
Urbanization and architecture mission	5500000	0	1956700000	4.2	1962200000	3.2
The mission of managerial services	650805875	4.7	2417219240	5.2	3068025115	5.1
Payment of commitments	-	0	14082837300	30.1	14082837300	23.2
Acquisition of properties	-	0	4500000000	9.6	4500000000	7.4
Other issues	-	0	488000000	1	488000000	0.8
Total construction credits	13958586160	100	46781561540	100	60740147700	100

Source: (Tehran municipal budget, 2010)

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A major part of Tehran Municipality's development budget (about 75 percent) devotes to transport and traffic, and urban services missions; therefore, urban projects are divided as follows:

a. Urban project with social and cultural mission

More than 4723 billion Rials, 7.8 percent of total construction credits of Tehran Municipality have been devoted to social and cultural mission. This mission is divided into three separate programs including controlling and reducing social pathologies, helping to cultural and social activities, and development of cultural and social spaces.

More than 90 percent of construction credits of social and cultural mission devotes to development of cultural and social spaces.

The reality is that the entity of programs and mentioned plans is presenting "pure public goods" services. These kinds of services do not have revenue and profitability and they are only presented for public consent or preventing social or economic costs in the future. Thus, following points should be considered in designing financial tools. For example, buy-back contracts that investor acquires product from the sale and earns profits do not work in this type of projects since there is no product for sale. Moreover, it can be said that these programs and plans origin from one type and it is possible to study the features of the program. However, it is not possible in cases that projects are more diverse and only the features are examined. Such is the development of cultural and social spaces. It includes 9 topics in its subset.

b. Urban project with traffic and transport mission

Traffic and transport mission has the most shares of construction credits both in districts and in deputies. The total construction credits of the mission were 24242 billion Rials in 2010; nearly 40 percent of total construction credits of Tehran Municipality. 21 percent of the figure has been devoted to the municipality districts and 79 percent to the deputies. The mission includes eight programs including urban subway, bus, minibus, taxi, parking, demand management and traffic control, terminals, walking and cycling facilities, and arterial network.

Among the seven missions of transport and traffic plans, arterial network program with 52.5 percent and urban subway plan with 36 percent have devoted the most credits to themselves. In other words, about 90 percent of credits of transport and traffic mission belong to these two programs. It should be mentioned that all allocated budget to urban subway program spends on construction aid to Railway Company of Tehran and Suburbs (Metro).

It is one of the instances of major and national projects. It can be said that the major part (79 percent) of construction credits of transport and traffic mission is financed by the municipality continuously. This shows the magnitude and being trans-regional of them.

The share of arterial network credits of total construction credits of Tehran Municipality was more than 21 percent in 2010. It is singly more than the share of

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social and cultural, urban services, safety and crisis management, urbanization and architecture, managerial services, cost of acquisition of properties, and other issues in the construction budget of the municipality. This shows great importance of arterial network and its subset plans in municipal budget. Similarly, special attention should also be paid to this program in designing financial instruments.

c. Urban projects with the mission of urban services

Urban services is considered as the most important mission after transport and traffic both in terms of volume and scope of its operations and budget allocations. The mission of urban services was more than 6415 billion Rials of construction budget in 2010. 4590 billion Rials, equivalent to 72% belonged to the municipality of districts and the rest of it belonged to its deputies. The mission has eight programs that parks, jungles, and green spaces devoted about 50 percent of total credits of the mission to themselves.

Financing urban projects of municipalities in the country

Undoubtedly, investment and absorbing Iranian and foreign capital need some pre-requisites, necessities, preparations, and infrastructures. If they are implemented well, organizations and institutions like municipality will obtain more resources particularly in foreign financing. These pre-requisites and preparations are true about foreign financing. As it is obtained by foreign country or institute, more attention is needed for both borrower and lender countries. All pre-requisites and preparations are divided into four categories including jurisprudential and legal requirements, structural and organizational requirements of the municipality, juridical and legal requirements, and technical and economic requirements.

1. Jurisprudential and legal requirements: municipality or any other organization should be aware of jurisprudential and legal laws and regulations, and compliance with received loan with Sharia and jurisprudential laws in this sector, particularly about interest on loans whether it is usury. Currently, foreign financing contracts are regulated in the form of reward or civic participation.

2. Structural and organizational requirements of the municipality: foreign financing of municipality is one of the long-term and important tools for long-term funding of urban projects in most countries. It can also be in line with entrepreneurship.

Municipality is not counted as a government-affiliated organization, but it is obliged to follow all government's regulations. Meanwhile, municipality like governmental organizations is obliged to exchange agreement with deputy of strategic planning and supervision for implementation of construction projects. Wherever the Council of Ministers' permissions are required, municipality's request is presented to the council of ministers via the Interior Ministry. According to the above-mentioned law, the council of ministers is allowed to grant subsidy to international organizations and institutions in which they are member and they use certain annual budget in the laws.

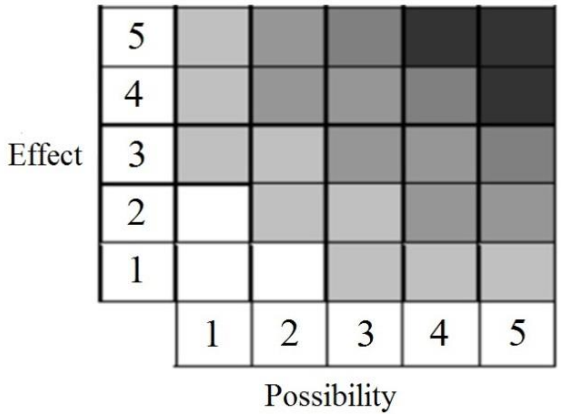
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3. Legal requirements: using foreign finance requires to be approved in the budget law of the country. Because of not using the total approved credits in the previous years, the remaining quotas of approved facilities of buyback contract and foreign finance, the issue of the use of foreign funds approved on September 28, 2005 and account commitments of foreign currency reserve enshrined in the budget laws of previous years in 2010 are acceptable. Meanwhile, obtaining the necessary permits from the Ministry of Interior, Ministry of Economic Affairs and Finance, Deputy of Strategic Planning and Supervision of the presidency and Central Bank of the Islamic Republic of Iran is necessary.

4. Technical and economic requirements: Generally, foreign finance is divided into two categories of exporting credits or seller's credits and commercial loans or buyer's credits from the perspective of payment loan. It is divided into two categories of autonomous finance and non-autonomous one from the perspective of the way of repayment of the principal and interest of the loan.

Generally, it seems that the manner of foreign funding cannot be used for all municipal projects and all missions of the institution. Foreign financing method should be used for projects that they are profitable in terms of economic features, and they should be in short term or medium-term from the perspective of return on investment. In terms of economic entity, they should be pure public goods or services. According to these conditions, only some of the projects can use foreign finance for their implementation.



The amount of possibility and impact of each risk is examined by Delphi method with participation of experts in risk committee. After determining the degree of them, the risks can be prioritized based on their degrees. The risks with higher priorities are of more importance.

$$I_{RR} = \frac{T_c \times |A_c}{T_b \times A_b}$$

T: the total score of PI

A: the average score of PI

B: the base value

C: the current value

The threats of financial funding are in table 4.

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Table4. The threats of financial funding

Row	Threat	The origin of the risk	possibility	impact	P.I	The priority of the risk
1	Lack of coordination between implementation factors of the project (employer, project manager, plan manager, internal councilor, foreign councilor, and contractor)	1. too many beneficiaries 2. lack of culture for group work	4	3	8	9
2	The request of change the project area by investor	Lack of participation of investor presence in planning stage	4	3	8	8
3	The request of changing delivery items of the project by the investor	Lack of investor's presence in planning stage	3	3	6	13
4	Lack of enough experience of the fourth factor in the scale of the project	Lack of implementation of large projects	3	3	6	11
5	Change in internal policies of Tehran Municipality about implementation of the project	Available historical records	3	4	8	7
6	The occurrence of the war in the region	Political and international conflicts	3	5	10	5
7	More international sanctions	Political and international conflicts	4	3	12	2
8	Continued global economic downturn	Political and international conflicts	3	3	4	15
9	The impact of some internal groups for avoiding foreign investment	Existing records	3	4	12	3
10	The government's disagreement or lack of support for the project	Elections and economic conditions	1	5	5	14
11	A ban on international flights to Iran	Iran's sanction	3	4	12	4
12	More decline in oil price	The global economic condition	3	3	9	6
13	Reduction of municipal revenues	Downturn of urban construction	3	3	4	16
14	Failure in the achievement of municipal services	1.limitation in resources 2.lack of single municipal management	3	3	6	12
15	Inability of Tehran Municipality for obtaining necessary permits from the City Council	The structure of city management	3	3	6	10
16	Municipal withdrawal of the custodian of the project	The decisions of the City Council	1	4	4	12
17	Difficulty in absorbing investors	The approval of city council for municipality in order not to present in the project	4	4	16	1

Source: (Researchers' findings)

4. Research Method

In order to achieve to the results of the research and testing of the results in a certain area, the research is applied in Tehran Municipality. For this purpose, some international cities have been studied as well as the current condition of Tehran Municipality. The range of research time is studying the financial funding of Tehran Municipality's projects during 1996 to 2011 emphasizing on mega scale projects and having the ability to use foreign financial resources.

The main required data in the research includes some information from completed, paused, or implementing projects

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in the city of Tehran. The information should contain all requires aspects particularly, in the field of funding and finance. In addition, the information related to the structure and the process of participation organization, municipal investment, and other responsible organizations for implementing municipal researches for pathology of process of absorbing investor and financial resources are needed.

In the foreign field, the information of some funding projects by the municipalities in the world is required depending on the necessities of the projects. A comparative comparison can be achieved via the information; an integrated approach can be extracted by examining the strengths and weaknesses of each method, and the model can be localized in the last stage.

To collect data and information, primary and secondary data were used. Primary data would be taken from conducted survey from financial institutions of the municipality, experts and managers of internal organizational units in the municipality. The secondary ones are written and documented information that are in the statistical yearbook of municipalities in the country, the information of statistical center of Iran, and other formal institutions.

In this article, ANOVA statistical method was used for analysis of variance of different groups. The method is used for comparing the average of one index in two or several groups. After determining presence or lack of disagreement among testing groups (the study of test significance in the table of variance analysis), the question arises; which mean difference between groups is significant? In this regard, various methods for comparing the average among groups are least significant Difference (LSD), Duncans Multiple Rang Test, Tukey's test, Dunnett test, and Newman-Keuls used in the article. LSD test as one of the most widely used of tests in comparison of averages or significant least difference method was used to compare groups and selected cities.

In the test, assuming zero average in all groups ($\mu_i = \mu_j$) for all $i \neq j$ was examined. If the difference of average between the two groups is more than a fixed amount of LSD, it means significant difference between two groups. To implement the test, it is important to note two things: firstly, this test should be used when the F statistic is significant in the tables of variance analysis. Secondly, the number of groups should not be a lot. In this case:

$$LSD = t_{\frac{\alpha}{3}N-a}\sqrt{MSE\left(\frac{1}{n_i}+\frac{1}{n_j}\right)}$$

In which, "a" is the number of groups, N is the volume of each group, and MSE is the degree of freedom than the sum of squared errors. It means:

$$MSE = \frac{SSE}{N-a}$$

If $\left|\bar{Y}t - \bar{Y}j\right| \rangle LSD$, we conclude that the average is different in two groups of the society. The correlation matrix shows the linear correlation between variables. Generally, Pearson correlation coefficient is used for showing the type and intensity of the correlation. However, the statistics are sensitive to far points and not being

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normal of distribution. In cases where there is doubt, Kendall tau and Spearman correlation coefficients can be used that are obtained based on ranks. Unlike the Pearson correlation coefficient, it is not sensitive to remote areas and non-normal distribution. It is only a random sample.

5- Research Findings

In order to study utilization rate of Tehran Municipality of foreign financial funding services for its municipal projects indicating that it is significantly less than large and similar municipalities in the world, the situation of Tehran Municipality was examined in the field of using foreign financial method for implementation of its projects in different years regarding its projects. The studies indicate that only a few municipal projects used foreign finance method such as commercial-administrative project of "Faranamaye Iran", waste management project of city of Tehran, case study of loan from ABC bank of Bahrain, and developing the northern half of Tehran Metro line 1, showing the success of the projects for implementation of municipal projects. Even though the absolute rate of absorbed foreign investment is very low for the municipality and it is about 100 USD in 2008, currently, much attention is paid to the method because of their success by foreign finance in Tehran Municipality. It is supposed to implement many other municipal projects by this method in Tehran including Imam Ali highway, Sadr-Niyayesh tunnel, cinema, entertainment and cultural complex, and development of Sadeqiyeh metro lines.

Comparing Tehran Municipality with other municipalities in the world showed interesting results. It has been tried to select developed and developing cities to compare and adjust Tehran Municipality with other cities having conformity and homology with it. For instance, capital cities, same size in terms of population or having cultural and social similarities like sister cities. Finally, six items were used for comparative study considering available statistics for using foreign finance of municipalities including New York, London, Istanbul, Kuala Lumpur, Shanghai and Seoul. The statistics of foreign finance of selected municipalities were obtained for a five-year period from 2007 to 2011 by municipalities' websites, the World Bank's site, or other methods. The general results are as follows: foreign finance is widely used in the municipalities of developed countries i.e. New York and London. Many projects are implemented by this method so that the amount of foreign finance in the Municipality of New York was more than 12000 USD in 2011 and it was 9000 USD in the municipality of London; much more than the share of Tehran Municipality. It was the same about developing countries. For example, Istanbul Municipality implemented many of its projects through loans from global banks. Kuala Lumpur, Seoul and Shanghai implemented the major part of their infrastructure projects by foreign finance.

To prove that Tehran Municipality's share of external financing is less than large municipalities, ANOVA method was used. This method is used for

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comparing the average of an index in two or several groups. The significance of the test in the tables of variance analysis and difference of mean among groups are studied after determining presence or lack of difference among testing groups.

Table5. A comparison of equality of average of foreign financial for municipal projects in the city of Tehran with other sample cities

City	The sum of squares between groups	The sum of squares within groups	The total sum of squares	F statistics	possibility
Tehran	5.5844 e8	1.080 e9	1.644 e9	8.839	0.00
Kuala Lumpur	67566016.1	93587934.7	1.612 e8	20215	0.00
Istanbul	840740053.3	52547529.5	93287582.8	21.708	0.00
London	2.009 e8	2.0401 e8	4.0410 e8	23.423	0.00
New York	4.945 e8	4.076 e8	9.021 e8	33.973	0.00
Seoul	60588598.5	71694836.7	1.323 e8	23.663	0.00
Shanghai	1.436 e8	2.426 e8	3.826 e8	16.572	0.00

Source: (Researchers' findings)

Average equity to attract foreign financing in Tehran's municipal projects comparing other intended cities has been addressed in table5. According to the possibility shown in the table, the assumption of an average equality of attracting foreign financing in urban projects in various cities in the 0.05 level is rejected. It means there are at least two cities that their averages are not equal with each other. Therefore, there are cities that are not equal with others in terms of foreign funding. Yet, in order to study more carefully, the average equity to attract foreign financing are addressed in Tehran's municipal projects comparing other intended cities.

ANOVA analysis and F statistics indicate that the average of absorbing foreign finance is equal in municipal projects of mentioned cities. According to the possibility shown in table 5, the assumption of average equity of absorbing foreign finance in municipal projects of Tehran City is rejected comparing with New York, Kuala Lumpur, Shanghai, Seoul, and Istanbul at the level of 0.05. Therefore, the share of Tehran Municipality is significantly low comparing large and similar municipalities regarding foreign finance.

Implementation of foreign finance models of municipal projects requires pre-requisites, necessities, and the relationship among the features of municipal projects with foreign finance of municipal projects is of great importance. Therefore, equality of external financing of municipal projects with transport missions, municipal services, and other missions have been studied in order to examine the issue considering the types of municipal projects with different missions by using ANOVA analysis. For this purpose, the equality of external finance in different cities with different missions of municipal projects was examined. ANOVA was used to study the difference average of several statistical societies. The results have been presented in table6.

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Table6. The rate of correlation of foreign finance of municipalities with municipal projects with transport mission in different cities

City	The sum of squares between groups	The sum of squares within groups	The total sum of squares	F statistics	possibility	Pearson correlation coefficient
Tehran	2902481.5	2749780.2	5652261.7	13.722	0.003	0.717
Kuala Lumpur	37791213.3	50144459.65	57938672.9	9.797	0.008	0.656
Istanbul	28470269.8	18424997.9	46895267.7	20.088	0.001	0.779
London	8e1.020	8e1.325	82e.345	10.006	0.007	0.659
New York	8e2.375	8e1.325	82e.325	10.006	0.007	0.769
Seoul	35280195.2	30762379.7	66042574.9	14.909	0.002	0.731
Shanghai	89830101.6	8e1.471	8e2.369	7.938	0.015	0.616

Source: (Researchers' findings)

The amount of F statistics and its zero number should be considered to study the equality of foreign finance of municipalities with projects with transport mission in different cities. The assumption of equal amount of external finance in projects with transport mission is rejected in selected cities considering the possibility of the statistics. Thus, external funding is not equal in projects with transport mission in the city of Tehran with other sample cities.

The correlation matrix creates a deep insight than the type of relationship among variables. The correlation matrix shows the rate of linear correlation among variables using generally Pearson correlation coefficient to indicate the type and intensity of the correlation. According to the amount of correlation coefficient between these two variables at the rate of 0.717 and its possibility at the rate of 0.003, the above results are confirmed. The obtained results have been shown in table7.

Table7. The equality of external financing of municipalities with projects with the mission of municipal services in different cities

City	The sum of squares between groups	The sum of squares within groups	The total sum of squares	F statistic	Possibility	Pearson correlation coefficient
Tehran	1190480	4461781.7	5652261.7	3.469	0.085	-0.459
Kuala Lumpur	14154654	73781018.9	87935672.9	2.494	0.138	-0.401
Istanbul	9526410.7	37368857	46895267.7	3.314	0.092	-0.451
London	35605174.1	8e1.989	82e.345	2.327	?????	-0.465
New York	88670943.2	8e3.132	8e4.019	3.680	0.671	-0.470
Seoul	13127812.5	52914762.4	66042574.9	3.255	0.096	-0.444
Shanghai	40504245.9	8e1.964	8e2.369	2.680	0.126	-0.413

Source: (Researchers' findings)

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According to the possibility and F statistic, the assumption of equality of foreign finance of municipalities' projects with the mission of municipal services is not rejected in the city of Tehran with other intended cities. According to the rate of correlation coefficient between these two variables at the rate of -0.4059 and its possibility at the rate of 0.085, the above results are confirmed as well. The assumption of equality of foreign finance of municipalities' projects with the mission of municipal services with other intended cities is not rejected. The rate of correlation coefficient between foreign funding of municipalities with projects with the mission of municipal services was -0.401. According to its possibility at the rate of 0.138, it indicates that the rate of foreign finance of municipal projects in Kuala Lumpur is equal with the mission of municipal services with other mentioned cities. Comparing Istanbul with the other cities, the assumption of equality of municipal projects financing with the mission of municipal services was confirmed. Comparing London and New York with other cities, the assumption was confirmed as well. According to table7, the amount of F statistic indicated the issue. According to the amount of F statistic, the assumption is note rejected in Seoul and Shanghai.

Table8. The amount of foreign finance of municipalities in urban projects with other municipal missions in different cities

City	The sum of squares between groups	The sum of squares within groups	The total sum of squares	F statistic	Possibility	Pearson correlation coefficient
Tehran	48093.73	5604168	5652261.7	0.122	0.744	-0.092
Kuala Lumpur	3033848	84901824.9	87935672.9	0.465	0.507	-0.186
Istanbul	1841580.4	45053678.3	46895267.7	0.531	0.479	-0.198
London	3360219.5	8e2.311	8e2.345	0.189	0.671	-0.120
New York	10723248.2	8e3.912	8e4.19	0.356	0.561	-0.163
Seoul	1862211.2	64150363.7	66042574.9	0.386	0.546	-0.169
Shanghai	215676	8e2.348	8e2.369	0.119	0.735	-0.095

Source: (Researchers' findings)

According to the amount of possibility and F statistic, the assumption of equality of foreign finance of municipal projects with other urban missions in the city of Tehran with other cities is not rejected in Tehran. According to the correlation coefficient between these two variables in table 8, the above results were confirmed. The assumption is not rejected in Kuala Lumpur. The rate of correlation coefficient between foreign finance of municipalities with projects with the mission of municipal services was -0.186. The possibility of 0.507 indicates that the amount of foreign finance of municipal projects is equal with other urban missions with other mentioned cities in Kuala Lumpur. Comparing Istanbul with other cities, the assumption was confirmed. Comparing London and New York with other cities, the assumption of equality was confirmed. According to the F statistic, the assumption is not rejected in Seoul and Shanghai.

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Table9. The relationship between the amounts of foreign finance and economic features of municipal projects in different cities of the world

City	Variable	Coefficient	T statistic	possibility	Coefficient of determination	Adjusted coefficient of determination	Durbin-Watson statistic
Tehran	Intercept	2207.691	5.890	0.00	0.995	0.993	1.89
	The number of total projects	50.621	2.462	0.032			
	Rate of risk	-3109.467	-5.515	0.00			
	Return on Investment	478.201	9.354	0.00			
Kuala Lumpur	Intercept	4254.626	4.558	0.001	0.998	0.997	1.89
	The number of total projects	396.189	5.156	0.00			
	Rate of risk	-5585.672	-4.055	0.002			
	Return on Investment	1538.844	4.496	0.001			
Istanbul	Intercept	7168.957	4.894	0.00	0.996	0.991	1.967
	The number of total projects	186.776	2.480	0.31			
	Rate of risk	-9128.3	-4.578	0.001			
	Return on Investment	532.219	2.175	0.052			
London	Intercept	-16187.88	2.57	0.26	0.995	0.993	0
	The number of total projects	1596.334	13.9	0.00			
	Rate of risk	-28211.47	-2.538	0.28			
	Return on Investment	1628.839	2.262	0.045			
New York	Intercept	14561.6	2.280	0.44	0.979	0.973	2.226
	The number of total projects	861.788	2.510	0.029			
	Rate of risk	-21043.2	-2.190	0.051			
	Return on Investment	2474.68	2.656	0.022			
Seoul	Intercept	10932.92	13.971	0.00	0.996	0.995	2.141
	The number of total projects	0124.931	2.253	0.046			
	Rate of risk	-15534.95	-12.809	0.00			
	Return on Investment	908.551	4.473	0.001			
Shanghai	Intercept	8976.9	2.093	0.060	0.993	0.992	1.8
	The number of total projects	91081	3.987	0.02			
	Rate of risk	-12738.2	-2.389	0.036			
	Return on Investment	-716.038	-2.341	0.039			

Source: (Researchers' findings)

According to the obtained results in table9, the relationship between foreign finance and economic features of municipal projects in the city of Tehran has been shown. Considering the significance, if t statistic and its possibility, the economic features have influential role in foreign finance of municipal projects in the city of Tehran including the total number of projects, the rate of risk, and ROI. The level of risk and rate of return on investment would be influential in the willingness of financial institutions in funding. The number of total projects has

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positive impacts on foreign finance of municipal projects in Tehran Municipality and the rate of risk of municipal projects has negative impacts on it. ROI has also positive impacts on external finance in municipal projects of Tehran Municipality. The obtained results can be relied on according to the amount of Coefficient of determination and Durbin-Watson statistic.

According to table9, the number of total projects has positive impacts on foreign finance of municipal projects in Kuala Lumpur Municipality and the rate of risk of municipal projects has negative impacts on it. ROI has also positive impacts on external finance in municipal projects of Kuala Lumpur Municipality. The obtained results can be relied on according to the amount of Coefficient of determination and Durbin-Watson statistic.

According to table9, the number of total projects has positive impacts on foreign finance of municipal projects in Istanbul and the rate of risk of municipal projects has negative impacts on it. ROI has also positive impacts on external finance in municipal projects of Istanbul Municipality. The obtained results can be relied on according to the amount of Coefficient of determination and Durbin-Watson statistic.

The relationship between the amounts of foreign finance with the economic features of municipal projects in London has been shown as well. The number of total projects and ROI has positive impacts on foreign finance of municipal projects in London and the rate of risk of municipal projects has negative impacts on foreign finance of projects. The results are significant according to the obtained possibility of statistic. New York, Seoul, and Shanghai are like other cities and economic features have equal impacts on foreign finance.

6- Conclusion and Suggestion

Implementation of foreign finance models of municipal projects requires pre-requisites and necessities, and the relationship between the features of municipal projects and foreign finance is of great importance. Municipal projects of Tehran Municipality have been categorized based on the features of social and cultural mission, transport and traffic mission, municipal services, and other ones. The assumption of equality of foreign finance of municipal projects with the mission of municipal services in the city of Tehran with other intended cities is not rejected in Tehran i.e. the type of missions influences the manner of foreign finance of projects. The assumption of equality of foreign finance of municipal projects with the mission of urban services with other mentioned cities is not rejected in Kuala Lumpur. The equality indicates that most metropolises have equal model in management and categorization of urban fields. The amount of foreign finance of municipal projects is equal with the mission of urban services with other intended cities in Kuala Lumpur. Comparing Istanbul with other mentioned cities, the assumption is confirmed. Comparing London and New York with other mentioned cities, the assumption is confirmed as well. The results indicate that studied indexes have equal importance in all mentioned cities. The

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number of total projects has positive impacts on foreign finance of municipal projects in Kuala Lumpur Municipality. The rate of risk of municipal projects has negative impacts on foreign finance of projects and ROI has positive impacts on foreign finance in municipal projects of Kuala Lumpur Municipality.

The number of total projects has positive impacts on foreign finance of municipal projects in Istanbul and the rate of risk of municipal projects has negative impacts on foreign finance of projects. ROI has positive impacts on foreign finance of municipal projects of Istanbul Municipality.

The numbers of total projects and the ROI have positive impacts on foreign finance of municipal projects in London. The rate of risk of municipal projects has negative impacts on foreign finance of projects and the rate of risk of municipal projects has negative impacts on foreign finance of projects. The results were the same in New York, Seoul, and Shanghai and the economic features have equal impacts on foreign finance.

Generally, according to the obtained results, many facilities and requirements are needed for receiving loan from banks, institutions, and foreign countries and implementation of municipal projects using external finance. Tehran Municipality identifies the necessities and pre-requisites well in different sectors for obtaining more success in this field. Moreover, the economic features of the projects have had influential role in foreign finance of municipal projects.

Therefore, observing following points are essential in case of need to international financial markets as one of the financial resources of projects:

- A necessity to reduce the rate of risk of project failure
- The volume of the required resources (number of projects)
- Appropriate ROI to meet the principal and interest of borrowed resources
- Developing and implementing correct criteria of management for the affairs of contracts

7- References

Abdeh Tabrizi, H. (2007). *A study of financing methods of business-office and residential complex of Majd project in Mashhad (second phase),* Mashhad, Samen Civil and housing Co.

Aeini, M. (2009).the industry of urban rehabilitation and renovation, and its development necessities, *the quarterly journal of urban economy*, 4th issue.

Babins, Sh. (2014). *Municipal Finance Internship Program: Information and Application for Interns*. *Municipal Finance Officers' Association (MFOA)*.

Hadizenoz, B. (2003). Economic study of renovation and rehabilitation of urban distressed areas near Holy Shrine in the city of Mashhad, *the quarterly journal of seven cities, 4*(14), 40-59.

Headdman, Richard., Yazvsky, Andrew. (1991). *The principles of urban designing,* translated by Rezazadeh, R; Abaszadegan, M. Tehran: university of science and industry.

Heshmati Molayi, H. (2010). *New methods of financing for rehabilitation of urban distressed areas,* a set of article abstracts selected in the 2nd conference on rehabilitation and renovation of historical areas, urban

[Downloaded from iueam.ir on 2026-11-06]

[DOR: 20.1001.1.23452870.1394.4.13.9.6]

distressed areas, and informal settlements, Shiraz.

Jafarzadeh Najar, M., Jannati, M. (2011). *Financing through issuing participation bonds: opportunities and threats.* Presented in the 1st conference on urban economy.

Jebel Ameli, M.S., Hadad, H., Haji Aghabozorgi, A. (2009). *Presenting a model for assessment of BOT financial projects based on project risk.* Available at: www.sanattadbir.ir.

Lotfalipoor, M., Ashna, M., Zabihi, M. (2010). *financing methods of urban projects in India.* The 3rd international conference on development of financing system in Iran.

Milani Eslami, P., Esmaeili, Sh. (2009). *A study of financing methods for projects.* Presented article in the international conference of development system of financing in Iran, Tehran.

Nasiri, K. (2009). *Financial tools and institutions in financing urban projects.* Presented article in the international conference of development system of financing in Iran, Tehran.

Piri, M. (2009). *An approach to the role of foreign direct investment in the process of economic growth and financing of developing countries (case study: Iran),* presented in the international conference on development of financing system in Iran, Tehran.

Sharzeie, Gh., Majed, V. (2011). City's sustainable financing, the manner of financing for urban sustainable development, *research center of urban and rural management,* 27th issue.

Slack, Enid., Bourne, Larry., Priston, Heath. (2006). Large Cities Under Stress: Challenges and Opportunities. *A report prepared for the External Advisory Committee on Cities and Communities*, Ottawa.

Technological research center of Sharif University of Technology. (2007). *A set of articles for the international conference on Islamic finance.* Tehran: researches in the construction and house Builders Company.

The budget book of 2010 for Tehran Municipality. Tehran Municipality.

Wu, Jiaping, Barnes, Tony. (2008). Local planning and global implementation: Foreign investment and urban development of Pudong, Shanghai, *Habitat International 32*.

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[DOR: 20.1001.1.23452870.1394.4.13.9.6]