



# Using A Choice Experiment to Measure the Development of Large Urban Redevelopment Projects: The Case of Tehran Urban Redevelopment Project

Mojtaba Rafieian<sup>1</sup>, Ali Asgary<sup>2</sup>, Zahra Asgarizadeh<sup>3</sup>

1. Associate Professor, Department of Urban & Regional Planning, Tarbiat Modares University, Tehran, Iran

2. Associate Professor, School of Administrative Studies, York University, Toronto, Ontario, Canada, M3J 1P3

3. Assistance Professor, Department of Urban Planning, Tehran University of Art, Tehran, Iran

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## Abstract

Tehran has experienced significant physical changes in recent years through various development and redevelopment projects. Navab project which started in 1994 has been one of the largest urban renovations in modern urban planning in Iran. Choice experiment method (CEM) has been used to assess some of the hidden and unaccounted social and environmental costs of this project. The results show that people were willing to pay significantly higher prices for houses that would provide them with cleaner, safer and more secure as well as more social networking opportunities as compared to the houses that were built as part of the redevelopment project.

**Keyword:** *Choice Experience Method (CEM), Environmental assessment, Navab project, urban regeneration, Tehran.*

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## 1. Introduction

Urban redevelopment projects create considerable amount of direct and indirect costs and benefits to users and non-users. The existing cost-benefit analyses (CBA) do not sufficiently account for all associated costs and benefits of urban projects. Among the immeasurable and unaccounted benefits or costs are the values that are generated or lost by some of the urban development and redevelopment projects. Quantifying the socio-environmental values and benefits of the projects has been one of the main issues during the past few decades and considerable efforts have been made by economists and planners to develop methods that are able to capture such benefits or costs. Even if the estimated monetary values contain uncertainty and is difficult to apply to CBA, it is essential to estimate the relative importance among different types of social, physical and environmental attributes to enable cost-effectiveness analysis (CEA) in those projects (Nakatani *et al.*, 2007).

Several methods have been suggested in the literature and have been implemented in decision making and planning for valuing socio-environmental attributes (Freeman III, 2003). These methods are divided into two mainstreams: revealed preferences (RP) methods and stated preferences (SP) methods. Both groups of methods have their own advantages and disadvantages. RP includes methods that measure socio-environmental values indirectly through marketed goods and services such as housing, wages, travel costs etc. Examples of these methods are: the household production model (HPM), travel cost method (TCM), hedonic price

method (HPM) and hedonic wage method (HWM) (Nakatani *et al.*, 2007). SP involves methods that measure socio-environmental values through direct methods such as questionnaire surveys and peoples' responses to hypothetical questions, and include contingent valuation method (CVM) and choice experiment method (CEM). CVM asks directly about the monetary values that people are willing to pay for socio-environmental changes, while CEM do not reveal monetary measures directly (Freeman III, 2003). CVM and CEM are the most well known and frequently used stated preferences methods. In the CVM respondents are asked to provide their maximum willingness to pay (WTP) or minimum willingness to accept (WTA) for a change in a socio-environmental attribute. While CVM elicits an individual's willingness to pay (WTP), it gives no information on the relative importance among different types of socio-environmental attributes. In the CEM respondents are provided with alternatives and their attributes, including socio-environmental and monetary attributes such as price, cost or tax and are asked to choose between different alternatives (Carlsson and Martinsson, 2001). Researchers can then find the values that responders place on each attribute using various statistical techniques (Freeman III, 2003; Yoo *et al.*, 2008). CEM is frequently being used, and responses to hypothetical questions in choice experiments are more likely to reflect actual behaviour of consumers. Unlike CVM, CEM provides willingness to pay for different environmental and non environmental attributes in one experiment. The goal of this paper is to assess the value of social and environmental attributes associated with Navab urban redevelopment projects in

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\*Corresponding author.

RAFIEI\_M@modares.ac.ir

Tehran, Iran. A CEM survey has been used to extract the values that people place on these attributes when they purchase various housing scenarios in the study area. The rest of this paper is organized as follows: Section two introduces the study area and the problem statement. Section three explains the theoretical foundations of choice experiment method. Section four describes the choice experiment design applied in this study. Section five provides the results and findings. Finally, section six summarizes the paper with some conclusions.

## **2. The Study Area and Context**

Navab project (Fig. 1) has been the largest and most ambitious urban redevelopment project in modern urban planning in Iran. It was in part a response to urban fabric deterioration and deprivation and long overdue recommendations of the Tehran master plan. The original aim of the project was to connect Tehran's network of highways in the north to those in the south of the city by widening the Navab Street (an old North-South Street in Central Tehran) and transforming it into a highway (Bahrainy and Aminzadeh, 2007). As part of this project, considerable number of houses and businesses in the Navab district had to be demolished. Therefore, in addition to the highway, the city decided to develop the corridor into a new urban complex by providing high-density residential, commercial and office uses. The total area of demolished residential units was 479,600 square meters and the length of the strip was 5,529 meter (Tehran Municipality, 1992a). This consisted of more than 20 neighborhoods with a population of 259828 in 1996. Actual implementation of the project started in 1994, and expected to be completed in four years. The scale of the project and the magnitude of demolition needed extensive financial resources to implement the project. As expected the Navab project turned to become one of the most costly urban projects and therefore city issued bonds with an attractive 20 per cent annual return rate to finance the project. The scale of the project, the magnitude of demolition, and the financial resources needed to implement the project were so high that no authority and/or organization dared to embark on the project. The project introduced more than 8500 new residential units to the area, most of which were below 75 square meters. The buildings, with a high density of up to 19 stories provide some 750,000 square meters of residential and 160,000 square meters of commercial and office spaces (Tehran Municipality, 1992b & 1996). This redevelopment project would have significant role in solving part of the extensive problems of the transportation network in the Greater City of Tehran. The width of the constructed highway is between 50-60 meters, and a depth of 10-30 meters is considered for buildings on both sides of the highway (Madanipour, 1999). However, the overall development and especially the residential developments of the project

lacked important elements. Financial pressures later forced the City to eliminate the social, cultural, educational, and environmental land uses such as a proposed park system and green spaces initially foreseen in the plan. The outcome of the project has been reviewed and criticized from different perspectives. The project has been criticized from not looking at the social, cultural, and environmental impacts and costs of such forms of developments. For example, the neighborhood in the Navab area before the redevelopment was a cohesive social, physical, and cultural entity, consisting of several well-defined neighborhoods with strong family and social relations, sense of belonging and unity. The Navab redevelopment project replaced this well-defined social, physical, and functional organization of the neighborhoods with some major physical, social and environmental issues (Bahrainy and Aminzadeh, 2007).

## **3. Choice Experiment Method**

The choice experiment method (CEM) encompasses a variety of multiattribute preference elicitation techniques first used under the conjoint analysis name by market researchers to evaluate potential new products and new markets for existing products (Garrod and Willis, 1997; Louviere, 1992, 1998, Louriere and Hensher, 1982, Louriere and Woodworth, 1983). The CEM is considered as a preferred method for valuing environmental attributes (Baarsma, 2003) and is now used as an alternative to CVM and to complement other revealed preferences methods. The CEM is an easy, flexible, reliable and useful method and as such has attracted more researchers and decision makers (Powe et al., 2005) and it is now used as one of the most feasible methods in valuation of multi-attribute services (Baarsma, 2003). The National Oceanic and Atmospheric Administration (NOAA) in the United States has included this approach in its recent rule-making governing natural-resource damage assessments (Johnson and Desvousges, 1997). The CEM is easier than other valuation methods in estimating the value of each attribute that makes up a good. In other words, it enables researchers to estimate the value of several attributes in one study. This is useful because many policies are more concerned with changing attribute levels, rather than losing or gaining the environmental good as a whole (Hanley et al., 1998). The CEM allows respondents to systematically evaluate trade-offs among multiple attributes or among different types of attributes (environmental and non-environmental) that may encourage respondent introspection and facilitate consistency checks on response patterns (Johnson and Desvousges, 1997). Also, because the CEM does not ask directly about the maximum willingness to pay of respondents, it reduces the number of protest responses. Finally, studies show that the results of this method are very close to individuals' real world choices and preferences. This is particularly true in case of marketed

goods and services (Hanley et al., 2003; Mazzanti, 2003; Louriere et al., 2000). There has been significant progress in the use of CEM in urban context in recent years such as road expansion (Hensher and Sullivan, 2003), people’s preferences for regeneration projects that change the aesthetic and use character of specified urban sites (Alberini et al., 2003), airport noise (Carlsson et al., 2004), costs and benefits of different configurations of the transport of hazardous materials by rail (Hiselius, 2004), housing preferences (Wang and Li, 2006), municipal waste disposal reduction and recycling services (Sakata, 2007), landscape preferences for land-use planning (Rambonilaza and Dachary-Bernard, 2007), and energy saving measures in residential buildings (Banfi et al., 2008). Theoretically, the CEM is based on the Lancaster demand theory introduced in the early 1960s and the random utility theory (RUT) (Luce, 1999; McFadden, 1974). According to this theory individuals’ decision to buy a good depends on the services that good provide to them (Lancaster, 1969). In other words, Lancaster argues that the utilities that individuals obtain from goods are not because of the goods themselves but because of their attributes (Karousakis and Birol, 2007). The RUT is based on the hypothesis that individuals will make choices based on the characteristics of the good as objective components along with some degree of randomness as random component (Snowball and Willis, 2006). Accordingly, the choice among two alternatives can be modeled using a random utility model (Adamowicz et al., 1994, 1997; Peters et al., 1995; Kuriyama and Ishii, 2000; Carlsson and Martinsson, 2001). In this model the utility function of household/individual *i* and its relevant indirect utility model for housing product can be denoted as:

$$\begin{aligned}
 U_{ij} &= V_{ij} + \varepsilon_{ij} \\
 &= V_i(x_j, T_j) + \varepsilon_{ij},
 \end{aligned}
 \tag{1}$$

where  $U_{ij}$  indicates individual *i*’s total utility derived from housing alternative *j*;  $V_{ij}$  indicates the objective component of the household utility;  $\varepsilon_{ij}$  is the random component that includes households characteristics;  $x_j$  is a vector of attributes in housing alternative *j*; and  $T_j$  is the amount of money a household pays for housing type *j*. Accordingly, the probability that household *i* will choose housing alternative *j* in choice set *C* can be expressed as:

$$\begin{aligned}
 P_{ij} &= \Pr(U_{ij} \geq U_{ik}; \forall k \in C) \\
 &= \Pr(V_{ij} - V_{ik} \geq \varepsilon_{ik} - \varepsilon_{ij}; \forall k \in C),
 \end{aligned}
 \tag{2}$$

and the log-likelihood function is as follows:

$$\ln L = \sum_i \sum_j d_{ij} \ln P_{ij},$$

where  $d_{ij}$  is the dummy variable of choosing (choosing housing alternative *j*: 1, choosing any other: 0). Assuming that the error term  $\varepsilon_{ij}$  are independently and identically distributed with an extreme-value distribution, implies that the probability of any particular housing alternative *j* being chosen as the most preferred can be expressed in terms of the logistic distribution (McFadden, 1973). This probability can then be expressed as:

$$P_{ij} = \frac{\exp(\sigma V_{ij})}{\sum_j \exp(\sigma V_{ij})},
 \tag{3}$$

The objective component of the utility can be assumed, for example, to be:

$$V(x, T) = \sum \beta_p x_p + \beta_T T
 \tag{4}$$

where  $x_p$  is the attribute of the housing alternative;  $\beta_p$  and  $\beta_T$  are coefficients.

The coefficients are estimated by the maximum-likelihood optimization model using Equations (2)– (4). Equation (4) is differentiated into Equation 5:

$$\sum_p \frac{\partial V}{\partial x_p} dx_p + \frac{\partial V}{\partial T} dT = dV.
 \tag{5}$$

When the utility is fixed at the present level ( $dV = 0$ ), and the attributes other than  $x_p$  are fixed at the present level in Equation (6), marginal willingness to pay (MWTP) for attribute  $x_p$  is described by Equation (6).

$$MWTP_p = \frac{dT}{dx_p} = - \frac{\partial V}{\partial x_p} / \frac{\partial V}{\partial T} = - \frac{\beta_p}{\beta_T}.
 \tag{6}$$

According to Hanley et al. (1998) researchers can infer four pieces of information from choice experiment method. First, which attributes significantly influence choice; second, the implied ranking of these attributes; third, the marginal willingness to pay (WTP) for an increase in any significant attributes; and forth, implied WTP for a program which changes more than one attribute simultaneously.

#### 4. Choice Experiment Design

The choice experiment method was implemented in this study to elicit households’ preferences for several bundles of environmental, social and physical attributes of ‘houses in the redeveloped Navab project area, Tehran, Iran. Sample householders were asked to choose preferred houses among several sets of alternative houses. In this study, each choice set was made up of two alternative houses that varied by certain environmental, social and physical attributes. A typical choice experiment design exercise consists of five

components (Louviere et al., 2000; Green and Srinivasan, 1978, 1990): 1) defining attributes, 2) assigning attribute levels, 3) creating scenarios, 4) determining choice sets and obtaining preference data, and 5) estimating model parameters. To define the attributes first a list of physical, social, and environmental attributes was developed on the basis of a literature review on urban redevelopment and residential amenities and consultation with experts and preliminary interviews with residents of the study are. In order to keep the total number of attributes as low as possible to reduce the complexity of choices 5 physical, social, and environmental attributes and a price attribute were considered: (1) environmental pollution (air, noise, waste), (2) house facilities, (3) neighborhood's facilities, (4) safety and security of the neighborhood, (5) social networks in the neighborhood, (6) price of the house. To assign the attributes' levels, except for the price attribute, all other attributes were specified at 3 levels, where the lowest level of each attribute represented the current condition and the other 2 levels showed the states of incremental improvement. These levels were described in qualitative terms due to uncertainty over the precise impacts of measures to alleviate the problem. Differences in the attribute levels and thus alternatives were based on the location of alternative houses in different parts of the redeveloped area. To draw reasonable range of price attribute, we used the average lowest and highest prices for similar houses in the city. The price attribute comprised 6 levels from 650 million Rials to 900 million Rials in 50 million increments (10,000 = \$1). The final list of attributes and levels are shown in Table 1. The third step in CEM involves creating choice scenarios. If the number of attributes and levels is small, all possible combinations could be used in the experiment. When the number of attributes and/or the number of levels increases the number of possible different profiles increases exponentially (Van-Poll, 1997). Six attributes each with 3 levels (except for the price with 6 levels) provide a large combination of alternatives. Therefore, an orthogonal design technique was used to reduce the total number of choices to a practical number (Louviere, et al., 2000). This technique selects a subset of all possible factorial combinations, which will have proper representation of the full set. Orthogonality of the design ensures that individual estimates of the respective attributes and levels are independent of each other (Aas et al., 2000). After using this technique and removing some of the unreal choices 10 alternatives were derived and used in the questionnaire. After scenarios are extracted CEM researcher should prepare multiple choice sets that comprise two or more options to be presented to the responders. In this study, there are two options in each choice set. The choice sets were constructed from the design and they were randomly divided into 10 blocks. Each respondent was thus presented with 5 choice cards, each containing two

alternatives. The respondent then indicated their preferred choice on each card. An example choice scenario is shown in Table 2:

If you want to buy one of these houses which one would you buy?

I prefer the first house

I prefer the second house

The final survey questionnaire consisted of three parts. The first part was intended to measure respondent's general attitudes toward the social, physical and environmental qualities of the neighborhoods and respondents' perceptions of the Navab redevelopment project. The second part, explained in detail below, contained the CE questions designed to elicit respondent' WTP for various attributes estimating tradeoffs between price and the attributes. The final part of the questionnaire dealt with the socio-economic characteristics of the respondent (e.g. age, sex, income and so on). The data collected for this study are drawn from a survey based on personal interviews carried out in the Navab area. In order to encourage higher responses and offer respondents the most scope for detailed questions and answers. In addition, professional interviewers were trained to conduct person-to-person interviews effectively. Prior to the main survey, questionnaires were pre-tested to discuss respondents' understanding of and reaction to the questions.

## 5. Analysis and Results

A total of 201 interviews were conducted in the Fall of 2007. The survey yielded 2010 (201×5) usable observations. Overall 45.3 percent of the respondents were female and 54.7 percent were male. Close to 40 percent of the respondents were between 18-34 years old and 58 percent were between 35-64 years of age. Majority of the respondents (82 %) had high school diploma and hire degrees. About 78 percent of the households had between 2-5 members in their family. The rest of the respondents were either alone or had more than 5 persons in their families. Around 56 percent of the respondents owned their house and the rest lived in rented apartments. Majority of the households belong to middle income family with average monthly income between 2 to 4 million Rials per month. Most of the residents had recently moved to the area. Around 28 percent of the respondents had lived in the area for less than two years. 38.8 percent had lived between 2-5 years and the rest (30.8 %) had lived in the neighborhood for more than 5 years. Apartments in Navab redeveloped area are between 45 sq meters to 120 sq meters. Around 26.3 percent of the respondents currently live in apartments that are below 70 sq meters, 22.6 percent live in apartments with 70-80 sq meters and 51.1 percent live in apartments that are over 80 sq meters. Several questions were asked to find out more about households satisfaction level with different

physical, social and environmental attributes of their houses, buildings and neighborhoods. A descriptive review of these findings provides more contexts to the study. Overall near 90 percent of the respondents were either very little, little or somewhat satisfied with the houses in the redeveloped area. Around 56 percent of the respondents believed that the Navab project houses are either very little or little close to their ideal houses. Near 37 percent considered them somewhat close. Only 6 percent of the respondents believed that they are somewhat close to their ideal type of house. Only 8 percent of the respondents were very much or much satisfied with the neighborhoods. The rest were either very little, little or somewhat satisfied with their redeveloped neighborhoods. In response to sense of belonging to the neighborhood more than 54 percent stated that they have very little or little sense of belonging to the neighborhood. About 19 percent had very much or much sense of belonging to the neighborhood. Only 6 percent of the respondents consider themselves very proud or proud of living in the redeveloped neighborhood. More than 67 percent mentioned that they are either very little or little proud of their neighborhood. Large percent of responders have very little or little interest in spending (71 %) their leisure time in the neighborhood. In response to a question on the livability of the neighborhood more than 64 percent of the responders indicated very little or little. Majority of residents do not consider the redeveloped neighborhood as a livable one. Ninety percent of the respondents feel that there is very little or little connection with the natural environment in their redeveloped neighborhood. Only 1 person has considered the neighborhood to be environmentally friendly. Similarly, very few respondents (2%) consider the neighborhood as very or very much attractive. Overall about 19 percent of the respondents think that on average their redeveloped neighborhood is either better or much better than other neighborhoods in Tehran. More than 55 % believed that the Navab neighborhood is either very worse or worse than other neighborhoods. The rest (25%) think that there is no difference between their area and other areas of the city. When we asked them if they are willing to leave the redeveloped neighborhood in the future, close to 50 percent of them indicated that they are very much or much willing to leave the area. Only 17 percent of the respondents showed very little or little willingness to leave their neighborhoods. Majority of the sample residents have very little or little knowledge about their neighbors. Around 10 percent indicated that have much or very much knowledge about their neighbors. This lack of knowledge is somewhat reflected in their interactions with their neighbors. More than 50 percent of the respondents have mentioned that they have no interaction and meeting with their neighbors. The remaining has had very few interactions with their neighbors. Unfortunately, more than 6 percent of

respondents have very little or little interest in making friends from the neighborhood for themselves and their children. Overall, majority of the respondents are satisfied with the facilities of their buildings. Respondents' answers to questions about housing facilities such waste collection, parking and storage facilities inside the buildings indicate that they have very little or little problem with these facilities. This is also supported by the fact that most of the households are happy about the management and superintendents of their buildings. It seems that households have little complains about the size of their apartments. All together 32 percent were very little or little satisfied and the rest were somewhat or much or very much satisfied with their apartment sizes. However, findings show that respondents are somewhat dissatisfied with the number of bedrooms in their houses. When asked about their overall satisfactions of the natural light in their apartments, majority of them were much or very much satisfied with that. Based on the respondents' answers, it seems that very few households are very little or little satisfied with the maintenance costs of their apartments. Overall majority of the respondents are not happy about living in high rise and apartment buildings. Only 25 percent of the households are either much or very much satisfied with life in tall apartment buildings. There was also a general agreement among the respondents that overall the neighborhood facilities are satisfactory because only 21 percent of the households were either very little or little satisfied with them. Finding also show that people in general are not satisfied with children play grounds, sport, educational, recreation, and health and medical facilities in the neighborhood. When asked about their satisfaction of their apartment outside view and landscape (what they can see from inside their apartment) more than 73 percent of the households were either very little or little satisfied. One of the most dissatisfied aspects of the neighborhood is its green space. More than 84 percent of the respondents are either very unsatisfied or unsatisfied. Residents have very little or little complains about noises created by neighbors in their apartment buildings. It is while majority of them are either very much or much dissatisfied with the amount of noise pollution that comes from outside their buildings (mainly the highway). This was one of the very few questions that a large number of respondents (62 %) indicated that they are very much dissatisfied with the noise pollution. There seems to be little problem with some other environmental and health issues such the sewer system and insects in the buildings. In terms of safety and security, overall more than fifty per cent of the households have shown very little or little concern about their building security. Only 24 percent are very much or much concerned about that. The overall security of the area seems somewhat satisfactory as less number of households have mentioned that they are worried about this in their neighborhood. They feel relatively

comfortable with the existence of outside lighting system and sending children outside. However, more households are concerned about theft and burglary. Traffic accidents seems to be a big safety issue in the neighborhood. Several questions were asked about the accessibility and relative location of the neighborhood in the city. Overall majority of the households are happy about the location of their neighborhood. This is not surprising as this area is centrally located in the city and very close to shopping and recreational facilities. When asked about their satisfactions with the distance between their houses and work places, only 17 percent of the respondents were very unsatisfied or unsatisfied. This means that the neighborhood is relatively accessible. However, this is not the case on access to schools as considerable number of respondents were either very dissatisfied or dissatisfied (40.3%) with the distance between their houses and schools. Access to public transit seems to be one of the least concerned factor in the neighborhood. Majority of the respondents were satisfied with access to public transit services. Only 11.5 percent of the households showed some form of dissatisfaction with access to public transit. Access to shopping areas is very satisfactory and majority of households seem to be satisfied with that. Respondents are also concerned with the density of population and crowdedness of their neighborhood. Near 50 % of the households are either very dissatisfied or dissatisfied with this attribute of their neighborhood. Table 3 shows the results of the logit regression. As these results show except house facilities all other attributes had significant impact on households' choices. All signs except for price have positive signs means that their increases will increase households' utilities. In other words, households are more likely to select housing options that have more of these attributes. As shown in Table 3 coefficients on all the attributes are highly significant

and have the expected signs. Thus, the coefficients on the five environmental, social and physical attributes are all positive, indicating that the level of these attributes is positively related to choosing alternative options. On the contrary, the coefficient on price attribute is significantly negative, meaning that the higher a price level is, the less likely is choice probability. According to these results environmental attributes has the highest impact on households' utilities and choices which means that respondents prefer houses with less environmental pollution. Social networking is the second preferred and significant attribute. Safety and security, neighborhood facilities, accessibility, and house facilities ranked lower respectively. House price has significant impact on respondents' utility and choice and its negative sign shows the theoretical validity of the results as more expensive houses have less utility and households are less willing to choose them. Marginal willingness to pay (MWTP) values for respondent's obtaining an increase from the less preferred level of each attribute can be calculated using regression results and Equations (5) and (6). The results of MWTP estimates for 5 attributes are shown in Table 4. For example, the MWTP for environmental attribute is calculated as -15.147 (151,470,000 Iranian Rials) in a simple model without covariates. This means that one-unit increase in environmental attributes has a marginal value of 151,470,000 Iranian Rials (~ 15,1140 Dollar). Similarly, respondents are willing to pay 6.9 monetary units to achieve one level higher of social networking attribute in their neighborhood. Based on these findings environmental attribute, social network attribute, and safety and security have the highest values for respondents. One can multiply these values to the total number of houses built in the area to estimate some of the hidden social and environmental costs of this redevelopment project which is estimated to be very high.

Table 1: Attributes and Levels

Attributes	Levels
Environmental Pollution (air, noise, and waste )	``Like the existing house``, ``better than the existing house``, ``much better than the existing house``
House facilities	``Like the existing house``, ``better than the existing house``, ``much better than the existing house``
Neighborhood's facilities	``Like the existing house``, ``better than the existing house``, ``much better than the existing house``
Safety and security of the building and the neighborhood	``Like the existing house``, ``better than the existing house``, ``much better than the existing house``
Social networks in the neighborhood	``Like the existing house``, ``better than the existing house``, ``much better than the existing house``
Price of house	650, 700, 750, 800, 850, 900 (million Rials )

Table 2: Sample choice card

<i>“Suppose you have the ability to purchase a house. You are given with two identical houses which are very similar in terms of design, age and size but different in the following attributes. After careful looking at each of these options please choose your preferred option.</i>		
Attributes	House 1	House 2
<b>Environmental Health</b>	A little better	Much better than current
<b>House Facilities</b>	Same as current house	Same as current house
<b>Neighborhood facilities</b>	Same as current	Same as current house
<b>Neighborhood security</b>	Same as current neighborhood	Same as current house
<b>Accessibility</b>	Same as current	Same as current house
<b>Social relations</b>	Same as current	Same as current house
<b>Price</b>	<b>650 million Rials (65000 \$)</b>	<b>700 million Rials (70,000 \$)</b>

Table 3. Estimation results of the simple model without covariates  
 Log Likelihood -1331.128    Chi2 = 118.6495    P-Value =0.000

Attributes	Coefficient	Significant level
Constant	-3.17810906	<b>.0015</b>
Environmental Health	1.6040	<b>.0000</b>
House Facilities	.1208	<b>.4054</b>
Neighborhood facilities	.3031	<b>.0363</b>
Neighborhood security	.6252	<b>.0000</b>
Accessibility	.4039	<b>.0039</b>
Social relations	.5101	<b>.0009</b>
Price	-.0416	<b>.0572</b>

Table 4: Marginal Willingness to Pay

Attributes	Coefficients	Marginal Values (in 10,000,000 Rials)
<b>Environmental Health</b>	1.56671	-15.147
<b>House Facilities</b>	.450378	-4.354
<b>Neighborhood facilities</b>	.58324	-5.638
<b>Neighborhood security</b>	.67863	-6.5612
<b>Accessibility</b>	.51287	-4.9586
<b>Social relations</b>	.716004	-6.9225
<b>Price</b>	<b>-1.0343</b>	<b>1</b>

## 6. Conclusion

This study tried to show some of the socio environmental costs of large urban redevelopment projects by providing quantitative information. The choice experiment was used to measure the value that people place on socio-environmental attributes of their urban residential neighborhoods. Overall, the survey was relatively successful in eliciting MWTP values for increasing multiple socio-environmental and physical attributes of their residential neighborhoods in a newly redeveloped urban area in Tehran. It was found that

people are placing significant value for environmental and social attributes of their housing and if they were to purchase another house of similar type they would rather choose the ones that provide them with better environmental quality, safety and security, and social networking opportunities. This to some extent explains that the new redeveloped area in Tehran significantly lack these attributes. In big cities like Tehran healthy environment is becoming rare and thus people are willing to pay more to have higher levels of such

attributes. This research shows that environmental factors play a major role in households' decision to purchase their houses. People also prefer neighborhoods that provide a sense of community and social networking opportunities. This is another attribute that people in big cities have less amount of it. People also place higher values for neighborhood safety and security. Generally these findings show that people place more values for none physical factors such as environmental health related attributes and social networks and safety and security as compared to physical attributes of the neighborhoods and the houses. In other words people place more values for factors that they have no control on that as compared to the factors that they have more control on them. In other words respondents have no control over air or noise pollution individually, but seem to be able to control the housing facilities. These findings have significant planning and policy impacts as well. Urban planners should pay more attention to the attributes that have more values for people in order to increase social benefits of the projects. While people place more values for environmental attributes such as locations with less air and noise pollution, too much attention to projects that have certain physical planning attributes might not necessarily maximizes the social benefits of the projects. This study provides some insight for future redevelopment policies as it provides useful information to help policy-makers in developing and implementing more appropriate policies to deal with urban redevelopment projects. It also illustrates that people place a substantial value for social and environmental attributes of houses and any project that is unable to provide such attributes indirectly increases the total costs of the projects. The results from this study provide a useful framework for incorporating such quantitative information in the evaluation of various policies with regard to urban redevelopment.

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