HEDONIC PRICE FOR CAR IN IRAN

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ABSTRACT

Car industry constitutes a major part of economic activities and is deeply linked to other economical sectors. This industry is a mirror reflecting the general situation of each country's industries. Car manufacturing industry is forced to renovate due to parametes effective on its products demand. Sedan car comprises a specific share of the family consumption expenditure among durable goods. The payments that the consumer bears for acquiring a sedan car which meets its needs depend on a set of parameters that identifies the car by such features. The Hedonic method is a method that considers the goods price a function of all its specifications and features and by this method you may study the priorities and interests of applicants.The implicit prices that are achieved in Hedonic method is an estimate of family's final desire to pay for car specifications which in fact the priorities of the family to choose the car will be determined by determination of the final desire to pay the price. In this research a full logarithmic model for estimation of Hedonic price model has been used in 3 section levels of 2006, 2008, 2010. The statistical population consists of 30 car models manufactured and assembled by sedan car manufacturing factories in Iran. Among the features presented for the car, 5 features group have a meaningful effect on the sedan car price among which we can point to the size of car which has the highest effect on car price and the consumer has the highest tendency for paying for this feature.

Key Words: Hedonic Pricing, Car's Price, Features's Car

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1- Introduction

Car is a multi-dimensional product; it means that each car has some observable and nonobservable characteristics such as size, weight, engine model brake system, type of steering, maximum speed, fuel consumption, brand, etc which affects its demand. In fact, the car includes a basket of characteristics with different value and grades to which the consumer pays attention and makes the car a multi-dimensional product. While these characteristics are various they are related in the mind of the consumer, so he/she consider the car a product. Hedonic method is used to consider the effect of the observable and non-observable characteristics on the car price. In this method the car price is dependent on the characteristics of it. In this method the consumer decides based on the income and the quality he/she expects from the characteristics of the car and the quality of other products. The consumer's willingness to pay for each characteristic of the car by the implicit prices is dependent on the Hedonic price. Different characteristics suggest different prices for car, for example the existence or nonexistence of automatic gear in Maxima suggests different prices for this car. In Hedonic studies it is considered that the car price reflects the consumer's willingness to pay in order to achieve the characteristics and facilities of the car. In other words the method considers that the difference in the price of the cars is due to characteristics of the cars. So, the car price indicates the maximum price that the consumer is willing to pay to enjoy the different characteristics of the car. Some characteristics affecting the car price are not valued separately in the market and/or are not transacted in the market separately such as car brands that have no separate price in the market but may affect the car price. In cases that the market does not present such information the pricing necessitates finding a scale for willingness to pay. One of the existing scenarios for pricing the non-market products and services is hedonic method.

2- Theoretical Fundamentals of Hedonic Price Function

Multi-dimensional products can be divided based on their characteristics. If the product price is considered dependent on the observable and non-observable characteristics the result will be the Hedonic function.

$$P(Z) = F(Z_1, Z_2, ..., Z_n)^3 \qquad (1)$$

[1]. The theoretic fundamentals of this research have been extracted from Rosen's article (1974).

P shows the balance price of the product Z that has been resulted from the junction of demand and supply in the market. Actually, the P balance price has been resulted from the basket of different characteristics of the product which has been achieved selecting and purchasing them by the applicant. Hedonic function was applied by Court in car market of the US. Then Griliches applied it in the car market in 1961. At first Hedonic regressions were considered an experimental method by which price indexes were adjusted regarding the quality changes. Theoretical fundamentals of Hedonic price have been resulted from Lancaster's consumption theory in 1966 and Rosen's in 1974 and shows that a product is a series of several different characteristics the complex of which affects the consumer's desirability. The Lancaster's model considers that the products are members of a group and therefore some or all of them are consumed in combined form regarding the price. In contrary, Rosen considers there is a group of products but the consumers' priority is not achieved by buying a combination of them. Each product is selected among a scope of products and is consumed separately. Therefore, in Hedonic pricing method there is no need to consume the products commonly and jointly within the group of products. Rosen's model can be noticed for lasting products. In this research Rosen's model is used that will be explained in detail.

2-1. Rosen's Model

Rosen says that Hedonic price shows the maximum prices paid by the applicants to achieve a unit of product with its defined characteristics. On the other hand, this variable indicated the minimum price of the unit product (considering its characteristics) in which the suppliers supply their products. The consumer's obvious priorities for the product is shown by desirability function $U(Z, X;S)$. Z is the level of different characteristics of the multi-dimensional product (car), X is the existing size of the product in the market (for price simplicity a unit has been considered) and S indicates the consumer's characteristics. Considering the price the consumer chooses Z and X with maximum desirability.

Max $\qquad U = U(Z, X;S)$

s.t $\qquad Y = X + P(Z) \qquad\qquad (2)$

Y is the consumer's income. By forming Lagrange's function and maximizing it we have:

$$L = U(Z, X;S) + \lambda (Y-X-P(Z))$$

$$\frac{\partial L}{\partial zi} = 0 \Rightarrow U_{zi} - \lambda P_{zi} = 0 \Rightarrow U_{zi} = \lambda P_{zi} \quad (3)$$

$$\frac{\partial L}{\partial X} = 0 \Rightarrow U_x \lambda = 0 \Rightarrow U_x = \lambda \quad (4)$$

$$\frac{\partial L}{\partial \lambda} = 0 \Rightarrow Y - X - P(Z) = 0 \Rightarrow Y = X + P(Z) \quad (5)$$

By dividing equations (3) and (4) one of the optimized choosing methods is obtained:

$$\frac{U_{zi}}{U_x} = Pzi \quad (6)$$

U_{zi} = the final desirability due to using characteristic i of product Z (multi-dimensional product)

U_x = the final desirability due to using other products

Then Rosen introduces the consumer's suggestion function and says that the money spent on other products will not be used for the considered product, thus he defines the value called the suggestion as follows:

$$\theta = Y\text{-}X \quad (7)$$

In other words, relation (7) shows the price limit for the consumption of the considered product. θ indicates total values pays for the considered product after spending on other products. By solving the equations (3), (4) and (5) for P(Z) where all characteristics are proved except Z_i the suggestive price function for the consumer is

$$\theta = Y\text{-}X = P(Z) \quad (8)$$

$$\theta = Y\text{-}X = \theta \ (Z;S, Y, U) = \theta \ (Z_1, Z_2, ..., Z_i, ..., Z_n; S, Y, U) \quad (9)$$

This suggestion function shows the maximum price to be paid by the consumer for a product with Z characteristics. If Z_i is derived from equation (9) the resulted equation shows the price the consumer is willing to pay for the extra unit of characteristic i of the product. Considering the balance conditions it will be as follows:

$$\frac{\partial \theta}{\partial Zi} = \theta_{zi} = P_{zi} \quad (10)$$

The consumer's final suggestion to use characteristic i is equal to the implicit price of

characteristic i. Therefore, the consumption balance is at the point that the consumer's willingness to pay becomes equal to the implicit price of each characteristic. So, the implicit prices include the consumer's willingness. Relation (6) which is the first condition for optimized choice indicates that in each optimized point the slope of suggestion curve and the slope of the consumer function are the same. So, the value of the last characteristic of the product is equal to the implicit price which must be paid for. Having studied the consumer's behaviour Rosen analyzes the producer's one and defines the producer's cost function as follows:

$$C(M, Z, B) \quad (11)$$

B is the production components and M is the volume of the considered product. The institution's profit function is as follows:

$$\Pi = M \ P(Z) - C \ (M, Z, B) \quad (12)$$

In such condition the production unit maximizes its profit by choosing optimized values M & Z:

$$\text{Max} = \pi = M \ P(Z) - C \ (M, Z, B)$$

$$\frac{\partial \pi}{\partial Zi} = 0 \Rightarrow M \frac{\partial P}{\partial Zi} - \frac{\partial C(M,Zi,B)}{\partial Zi} = 0 \Rightarrow P(Z) = \frac{C_{zi}(M,Zi,B)}{M} \quad (13)$$

$$\frac{\partial \pi}{\partial M} = 0 \Rightarrow P(Z) - \frac{\partial C(Z,M,B)}{\partial M} = 0 \Rightarrow P(Z) = \frac{\partial C(Z,M,B)}{\partial M} \quad (14)$$

Therefore, the maximum profit will be achieved if the final income of each characteristic is equal to the final production cost. Based on the above analyses Rosen defines the suppliers' suggestion function as follows:

$$\phi = \Phi \ (Z, M, B, \pi) \quad (15)$$

Φ is the money claimed by the institution with aim profit for π and parameter B to produce M products with characteristic Z. In fact the supplier's suggestion is equal to the price of the considered product in the market, in other words:

$$\phi = \Phi(Z,M,B,\pi) = P(Z) = \frac{\partial C(M,Z1,...,Zn)}{\partial M} \quad (16)$$

$$\Phi_{zi} = Pi(z) \quad (17)$$

The balance of the production unit is achieved by equality of the price suggested by the supplier with the implicit prices resulted from Hedonic function.

If the profit maximizing behaviour of the supplying institutions and the consumer's optimizing behaviour are considered together the following conditions are established:

$$\theta = \theta(Z^*;U^*,Y) = P(Z^*) = \phi(Z^*;\pi^*,M,B)$$
(18)

$$\theta_{zi} = \theta(Z^*;U^*,Y) = P_{zi} = \phi_{zi}(Z^*;\pi^*,M,B)$$
(19)

Z^* is the optimized volume of the product Z and π^* is the optimized profit of the institution. The consumer buys with highest willingness to pay for a series of characteristics which have the minimum cost for the characteristics. Rosen has applied TSLS (two-stage least squares) to solve the system.

3- Background of Research

We review experimental studies for Hedonic in this part. Most studies conducted on car in Iran considered and estimated the demand for car a function of income, price, price of the substitute and complementary product. In these studies the car has been considered a one-dimensional product while choosing a car from the consumer's point of view is dependent on its features and characteristics as well. Having considered his/her limitations the consumer tries to maximize his/her desirability; this desirability is resulted from the features and characteristics in case of multi-dimensional product such as car. Hedonic method studies the demand for car from this aspect. Hedonic method has not been applied for the market of sedan cars in Iran but it has been applied for housing, home appliances such as refrigerator and vacuum cleaner, diary industries and environment. In other countries including USA, Spain and Portugal, etc. a lot of studies has been conducted with Hedonic method, for example, Griliches has applied for car market of the US in five time frames. He has applied semi-logarithm in his research and has interpreted the coefficients as the estimation of percentage of estimation of prices of the car due to change in a characteristic and constancy of other characteristics. For example in 1960, increase of 10 horsepower supposing that other characteristics are constant lead to 1.19% increase in car price (with 0.3% standard deviation). 100 pounds increase in the car weight has lead to 1.36% increase in the car price. Increase of 10 inches (about 25 cm) in the car length as other qualities are constant has lead to 0.15% in the car price.

In another research Goodman has studied the consumers' willingness to pay for the efficiency and capabilities of the car. He has used cars with two years

of working in two separate years, 1977 and 1979. The selected function form is semi-logarithm one. Some results of Hedonic regression is: one cubic inch increase in the length of the front and back wheels results in $50.50 increase in the car price in the market. The analyses show that willingness to pay is so sensitive to changes in fuel consumption of the cars. 1% of fuel increase leads to 2% decrease in the willingness to pay. In a research Reis has studied the effects of the quality changes on the price of new sedan cars in Portugal in 1997-2001. He says that fast improvement of technology leads to improvement of the products quality; this improvement in the product quality has not been considered in calculation of CPI and causes CPI to show the inflation more than the real one. This conclusion shows the importance of study of quality changes on the price indexes. He has applied Hedonic method to study the effects of quality changes on the products price. The research results show that the average quality of new sedan cars in the car market of Portugal is increasing and this issue has been considered in estimating the price index. In 2002 Toomat has applied Hedonic method in the Italian car market in 1988 to 1998 in eleven time frames. He has chosen full-logarithm model as the best one and has interpreted the quality variables coefficients such as car size, weight and engine volume as the attraction. For example, regression shows that by 1% increase in the engine volume and keeping other characteristics unchanged the car price will be changed up to 3%. In an article in 2010 Matas estimates the Hedonic prices for the car manufacturer. He has studied Spanish car market in 1981-2005. Applying Hedonic method in the car market is logical because technology changes improve the quality of different parts of a car such as convenience, performance, confidence and efficient fuel. Estimating Hedonic price method helps us to explain the price difference due to various characteristics of the product. He has considered the inconstancy the coefficients during the time and has provided some suggestions for the issue. He calculates the implicit prices by making an average for weight ambulant for the estimated coefficients within a period. The used variables in this study are classified in six groups as follows:

1- Performance including horsepower, weight.

2- Easy of drive including automatic gear, reinforced steering

3- Comfort including number of doors, air-conditioning, kilometer counter, power-operated windows.

4-   Size including length, width, height, minivan

5-   Fuel efficiency including fuel consumption in 100 Km, diesel

6-   Safety features including ABS (antilock brake system)

These variables are those features which affect the consumers' choice in buying a new car. The function applied in this research is linear logarithm (semi-logarithm) and the variant is dependent on the price logarithm. He concludes that the inconstancy in the estimated coefficients will be corrected by calculating weight average for annual coefficients and the opposite variance has been chosen as the weight.

4- Importance of the Issue

Car is a multi-dimensional product, i.e. it has different characteristics and features which variety affects its price and caused different models to have different prices. The car features can not be transacted in the market separately, so we must apply a method by which we can estimate the market price of each feature. The consumer chooses a car to use when its desirability maximizes considering its price. It means that the consumer chooses a model of car considering the desirability he/she obtains from other products as well as the one he obtains from the car features. In fact the car characteristics and features affect the desirability of the consumer and cause the car to be chosen by the consumer. Hedonic method is applied to estimate the market value of each feature of the car as well as studying the consumer's willingness to pay for each feature of the car.

5- Research Hypotheses

1) The performance of the car fuel consumption has a positive and meaningful impact on the sedan car's price.

2) The safety features of the car have a positive and meaningful impact on the sedan car's price.

6- Research Variables

In this research the variable is dependent on the price logarithm and the independent variables are divided into two observable and non-observable groups. Observable features of the car are 1) efficiency variables (engine power in horsepower – car weight in kilogram – engine volume in liter – maximum speed in Km/H); 2) easy drive variables (automatic gear: if the automatic gear is one of the standard features of the car the value is considered one, despite it is considered zero – hydraulic steering: if the hydraulic steering is one of the standard features of the car the value is

considered one, despite it is considered zero), 3) convenience variables (air-conditioning: if the air-conditioning is one of the standard features of the car the value is considered one, despite it is considered zero – power-operated window: if the power-operated window of four doors is one of the standard features of the car the value is considered one, despite it is considered zero – acoustic system: if the acoustic CD system is one of the standard features of the car the value is considered one, despite it is considered zero – electric seat: if the electric seat is one of the standard features of the car the value is considered one, despite it is considered zero), 4) car length variables (car length in meters – car width in meters – car height in meters), 5) fuel efficiency variables, and 6) car safety features variables (airbag: if the airbag is one of the standard features of the car the value is considered one, despite it is considered zero – ABS: if the ABS is one of the standard features of the car the value is considered one, despite it is considered zero – EBD: if EBD is one of the standard features of the car the value is considered one, despite it is considered zero). All non-observable variables of the car are considered under the car brand (trademark).

7- Statistical Society

The statistical society in this research includes 30 models of cars produced and assembled by Iran Car Factories. The cars are selected based on their abundance in the society as well as accessibility to their statistics and information. Some of studied cars are Pride, Roa, MVM, Maxima, Xantia, Roniz, Tondar 90, Peugeot 405, Peugeot 206, Samand, Megan, Peugeot Pars, etc. we apply Hedonic method in three periods, 2006, 2008 and 2010.

8- Research Method

In this research Hedonic method is applied to pricing the sample sedan cars studied in the Iranian market in three years 2006, 2008 and 2010. The periods have been chosen considering car statistics and information accessibility. Rosen's model has been applied for the research. Eviews6 software package has been applied to estimate Hedonic models, coefficients and econometric analyses. Excell and Minitab16 software have been applied to study some statistical features.

9- Research Limitations

In this research two group of information are needed: 1- car price and 2- car features

The car price is one of the economic variables which are not published officially and continuously by reputable statistical centers and car manufacturing

factories do not present such information to the researchers the reason of which is probably the unreal car prices in Iran. One of the limitations of the research is gathering the car prices in Iran that caused the scope of car choices to be limited which is resulted in limitation of time period and its duration. Car characteristics and features are another part of required information in this research. Since the improvement in car quality in the studied period was not achieved caused many dependent variables are co-linear with each other and leads to limitation of scope of econometric method choices. But in the Iranian car market the car price has been increased during the periods without too much change in the quality of the cars; the reason of which can be sought in changes of foreign exchange rate (because some parts of the car are imported), inflation increase, changes of substitute and complementary products price as well as high tariff for importing cars. The increase in tariff of imported cars leads to increase of imported cars price and prepares for increase in the price of the domestic cars and in the contrary decrease in tariff of imported cars leads to decrease of imported cars price, so the domestic manufacturers must decrease their costs, increase of productivity and decrease of the cost price to compete in the domestic market that causes price decrease in the domestic market. Another limitation of the Iranian car manufacturing market is that the marker is not transparent and the information is asymmetric. Another limitation of the research is limitation of sedan car models produced by domestic car manufacturing factories which affected the volume of the research.

10- Research Model

The economic theory does not limit the following form to estimate Hedonic price function. The most common following forms applied in Hedonic pricing method are as follows:

$$P_i = \beta_0 + \Sigma_{j=1}^n \beta i Z i j + \varepsilon_i \qquad \text{(20) Linear Form}$$

$$LogP_i = \beta_0 + \Sigma_{j=1}^n \beta i Z i j + \varepsilon_i \quad \text{21)Semi Logarithm Form}$$

$$LogP_i = \beta_0 + \Sigma_{j=1}^n \beta i LogZ i j + \Sigma_{t=1}^m \alpha t D t i + \varepsilon_i$$
(22) Logarithm-Logarithm Form

$$(P_i^\lambda - 1)/\lambda = \beta_0 + \Sigma_{j=1}^n \beta i Z i j + \varepsilon_i \quad \text{(23) Box-Cox Form}$$

The dependent variable in the models indicates the market price of the sedan car. Dependent quantity variables are shown by Z_i and dependent quality

variables are shown by Dum variable D_i. Also, β_0 is the fixed value or latitude from the basis. These variables show the features and characteristics of the sedan car. In Box-Cox form λ is the non-linear conversion parameter. The value of parameter λ in Box-Cox form shows the following form to establish relation between the dependent and independent variable. If it is 1 the model will be linear and if it is 0 the model will have logarithm form. Minitab 16 has been applied to achieve to the value of parameter λ. It has calculated the λ value for 2006, 2008 and 2010 and suggested the best value for λ. The suggested value λ for the three periods is zero that says tell us the dependent variable must be in logarithm form. After determining the Box-Cox conversion for the dependent variable Semi Logarithm and Logarithm-Logarithm Forms are studied. After considering Semi Logarithm and Logarithm-Logarithm Forms and comparing Log Likelihood and Schwarz scales the Logarithm-Logarithm Form was selected due to higher Log Likelihood and lower Schwarz and higher explanation power and because more of its independent variables are meaningful.

LogP
$$_i = \beta_0 = \Sigma_j^n =_1 \beta i LogZ i j + \Sigma_{t=1}^m \alpha t D t i + \varepsilon_i$$

After estimating Logarithm-Logarithm Form by applying Ordinary Least Square (OLS) in three periods the normality test of the reminder was conducted. The value of Jarque-Bera indicates the normal distribution for the remainders in three periods. Then White Test has been conducted to study the homoscedasticity and Ramsy Test to study the specification error. The results show that there is no heteroscedasticity and specification error in the estimated forms in three periods. T statistic is applied to examine the meaningfulness of the forms coefficient. The zero hypothesis shows that the coefficients are not statistically meaningful, in other words the zero hypothesis of the test shows that the coefficients have no difference from zero.

$$\begin{cases} H0 : \beta i = 0 \\ H1 : \beta i \neq 0 \end{cases}$$
i=1, ...k

In the estimated forms all variables are probably 90% meaningful. Non-observable features of the car which are generally considered as brand were deleted from the model due to co-lining with other variables and failing to be meaningful. The reason is that different brands of car in Iran are not different in quality level, so different brands in Iran is the variable which has not impact on the consumer's willingness for

car features. The estimations show that the car convenience such as power-operated window (4 doors have power-operated window) and electric seat as well as air-conditioning system are not meaningful in the forms, so they were deleted. These variables have defined as Dami variables and if they are a part of standard features of the car are considered one and if they are extra equipments of the car they are considered zero. Meaninglessness of the variables indicates that existence or inexistence of these features as the standards characteristics have not been considered importance features by the consumer.

Since the form is Logarithm-Logarithm the coefficients show attraction. The attraction shows the percentage of the change in the dependent variable for a percent of the change in the independent variable. The value of each coefficient in Hedonic models shows their importance in the car price, so the higher coefficient indicates that the considered feature has higher effect on the car price.

Table 1- Coefficients of Logarithm-Logarithm Form regression on the selected cars in 2006, 2008 and 2010

Variable	Made: 2006		Made: 2008		Made: 2010	
	Statistic t	Coefficient	Statistic t	Coefficient	Statistic t	Coefficient
Engine Power	-----		(3.22)	0.928	(3.241)	0.836
Engine Volume	(1.743)	0.827	-----		-----	
Car Weight	(3.624)	1.699	-----		-----	
Maximum Speed	(1.767)	1.404	(2.800)	2.394	(3.702)	3.0002
Height	(1.897)	2.121	(3.243)	3.817	(3.323)	4.131
Fuel Consumption	(-3.968)	-0.450	(-2.909)	-0.935	(-3.564)	-1.180
Hydraulic Steering	-----		(1.799)	0.279	(1.914)	0.314
EBD Brake	(3.150)	0.268	(1.779)	0.144	(2.467)	0.210

Source: Research findings

The estimated coefficients shows that among the car functions easy of drive, convenience, size, fuel efficiency, safety features, and non-observable features of the car, variables such as maximum speed, height, fuel consumption and safety system have meaningful effects on the car price in the three periods. Engine volume of the car in cars made in 2006 has affected the car price. Engine power and hydraulic steering in cars made in 2008 and 2010 have affected the car price. The estimated coefficients are a part of the sedan car price which shows some percent changes against one percent of change in that feature. For example, the engine volume variable had a positive and meaningful impact on the car price in 2006; the car price was raised 0.827% against 1% increase in the engine power, considering that other features are stable. The car

height has the most impact on its price. As shown in the table the car price had raised 2.121% against 1% increase in the car height in cars made in 2006, 3.817% in cars made in 2008 and 4.131% in cars made in 2010. The fuel consumption variable has opposite impact on the car price. This variable has a negative and meaningful impact on the car price; if the car fuel consumption decreases 1% the car price increases 0.450% in 2006, 0.935% in 2008 and 1.180% in 2010, considering other features are stable. About features such as hydraulic steering and EBD brake which have entered the form as dum variables the coefficients can be interpreted as follows: if the hydraulic steering is the standard feature of the car the car price has 0.279% increase in cars made in 2008, and 0.314% in cars made in 2010 comparing the cars which do not have such feature as the standard one. About safety system of the car if EBD brake becomes the standard feature of the car the price will be increased 0.210% in cars made in 2010.

10-1- Implicit Price of the Car Features

After estimating regression coefficients in Hedonic forms the implicit prices shall be calculated which shows the consumer's willingness to pay for each feature of the car. In fact the implicit prices are extracted to study the behavior and preferences of the consumers. Actually the implicit prices are estimation of the final willingness of the families to pay for each feature of the car and indicate the importance of the feature from the consumer's point of view. The consumer's final suggestion to use the feature i of the car is equal to the implicit price of that feature. In Logarithm-Logarithm form the implicit prices are not fixed yet it depends on the level of the features. The following table provides implicit prices for different features of the sedan cars based on the average price and average of car features.

Table 2- Implicit price of each feature of the car in 2006, 2008 and 2010

Variable	2006	2008	2010
Engine Power	-----	0.194	0.184
Engine Volume	10.586	-----	-----
Car Weight	0.033	-----	-----
Maximum Speed	11.077	20.175	27.55
Car Height	35.039	67.46	79.438
Fuel Consumption	-1.319	-2.932	-4.036
Hydraulic Steering	-----	7.298	8.936
EBD	6.552	3.767	5.976

Source: Research Findings

If the consumer's preference changes for one feature it leads to positive effect on its demand, i.e. the consumer's preferences are affected by the desirability

of the products; this desirability is affected by so many factors such as the people's education, age, income, religion, culture, time expense and quality of the product.

The engine power, engine volume, maximum speed and car weight are variables of efficiency and function of the car. The engine volume assesses the maximum power generated by the engine the engine power affects the car speed as well as car weight. It means that for increasing the maximum speed the engine power and car weight ratio shall be increased. These features are related to each other and affect the car performance. Maximum speed of a car is a proper scale to consider the car efficiency. As shown in table 2 the consumer's willingness to pay for maximum speed of the car has been increased or in other words the consumer's willingness for increase of car efficiency has been increased within three periods. As it is obvious the consumers' willingness has been increased for car speed. The fuel consumption is a feature we consider especially.

Economics is the science of optimized resource allocation and the price is the mean of optimized resource allocation, thus if the products and services do not have their real price there will be waste in consuming them. Fast growth of consuming oil products and generally energy in the country necessitates making proper decisions for using the energy sources. Among the oil products gasoline and gas oil as the fuel used in transportation sector of the country have been considered especially. The economists believe that the consumers can be lead to optimized consumption by some policies such as amending the price of the energy bearers and providing the required conditions for optimized consumption. The government has paid heavy expenses for importing gasoline due to inefficiency and non-optimized fuel consumption in the cars produced in the country, and on the other hand increase in the price of these energy bearers in the international markets makes more pressure on the economy of the country for supplying gasoline subsidiary, therefore has adopted non-price policies such as allotting the fuel and price policies such as increasing the fuel price. The increase in the gasoline price as the fuel of sedan cars has lead to increase in the expenses of the families. This expense is a variable expense and it depends on the consumption. If the car efficiency has been optimized the fuel costs will be decreased, so the consumer's willingness to pay for fuel efficiency is important to be studied. Hedonic method helps us to assess the consumer's willingness to pay. Considering the findings of the research in 2006, 2008 and 2010 the consumer's willingness to pay for

fuel efficiency has been increased. Allotting gasoline has begun in 2007, so the studies in 2008 and 2010 are situated after implementation of gasoline allotting. The consumer's willingness for fuel efficiency has been increased from 2006b to 2010. It means that fuel efficiency has been increased for the consumers.

The consumer's willingness to pay for easy of drive which has been considered as hydraulic steering was increased in 2010 comparing to 2008. This variable was not meaningful in the form in 2006 and was omitted from the form. Easy of drive is one of the features in which the consumers are interested. If the feature becomes the standard feature of the car in the cars in the sample society of the study that do not have the feature as their standard feature the consumer will pay a higher price for that car. Hydraulic steering makes driving safer comparing the mechanical one because of lower steering offset while the car passes the obstacles and takes its sharpness remarkably. One of the features of the car which affects the price meaningfully is the safety system of the car that has been introduced by ABS and EBD brakes. EBD system is not an independent system and it is installed on the cars an auxiliary and complementary for ABS. EBD is a system which prevents the car offset in different surfaces. This system distributes the brake power. In a car without ABS brake if the driver stops the car suddenly the car will lose its balance but ABS brake prevents the wheels to be locked completely and causes the car not to loose its balance and to be stopped faster and EBD brake system is to complete the safety system of the car. In a road covered half asphalt and half snow if the car brakes the car will be pulled to asphalted part of the road if the car enjoys ABS brake and will go off the road. But EBD brake system controls the car on all sliding surfaces. Safety system of the car is important for the consumer. As mentioned above we analyzed dum variables in Hedonic forms as follows: if the feature becomes the standard feature of the car the estimated coefficient indicates the value of change in the car price against converting the feature to the standard one of the car. We use this analysis for the implicit prices it means that if a feature of the car that is extra equipment becomes the standard feature then the consumer will pay higher price for the car. The numbers reported in table 2 shows this issue. The size of the car has been considered by car height. Height changes that have lead to production of high height and coupe cars is the feature which attracts the preference of the consumer. This feature is an important and effective one for the consumers for which the consumer pays the highest price for height change among other features of the car.

Car is a luxurious product, i.e. the more the people's income the more demand for car but the increase in the car (luxurious product) is more than income increase. The increase in the income of the people in the studied period (for example the average income of a urban family has been 65, 509, 108 in 2006 and 77, 994, 257 in 2007) and the government measures for fairly income allocation and facility of car purchase conditions such as receiving different loans of leasing khodro, conditional purchase from car manufacturing companies, etc. has lead to car demand increase in the society. As mentioned demand for car is in fact demand for features and characteristics of the car and this issue was studied by Hedonic method. It is obvious that the consumers' preferences have changed for car efficiency and function among which the car size introduced by car height is the most important one for the consumers.

The implicit prices are in fact the consumer's priorities to choose the car. Therefore, identifying the effective factors on the car price from the consumer's point of view shows the existing demand in the market and could be a guide for investors and planners.

11- Conclusion

Policymaking and planning to achieve more shares in the market among the car manufacturers will be possible by identifying the consumers' willingness and priorities because the consumers' preferences would be identified by studying these priorities, so a proper planning and investment will be performed in this industry of the country. The results of the research indicate that five groups of features of the car out of the six introduced observable groups are more important and investment in these five features would be effective on the manufacturers' market share. Variables such as car efficiency (function), easy of drive, car size, fuel efficiency and safety features have meaningful and positive effect in three studied periods. The car size variable has the highest effect on the car price and the consumer has the highest willingness to pay for it. The fuel efficiency is the feature the consumer is willing to pay to improve it. Safety system has a meaningful effect on the car price. Easy of drive is a feature which has become important for the consumer. Car efficiency is an important feature of the car for improvement of which the consumer is willing to pay more. The non-observable features do not become meaningful in the form and therefore they were omitted.

Hedonic method could be used to modify the price indexes considering the change in the quality of the products. Therefore, the State statistical centers can use this method to modify CPI for the products the quality of which is improving. Hedonic method would be used in other multi-dimensional markets such as computer and cell phone. In addition, this method would be used to evaluate the value of the amusement parks and touristy places, weather quality, etc. which have no market.

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