Demand Functions for Cinema in Different Provinces in Iran

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Abstract

In this article, the demand functions for cinema in different provinces are estimated using the Almost Ideal Demand System. Then price and income elasticity are calculated for each province and for the entire country.

The obtained results show that price elasticity for the entire country is equal to -0.91; and in the provinces except for Isfahan, Hormozgan, Kerman, Kurdistan, Mazandaran, and Eastern Azerbaijan, it is less than 1, which implies price inelasticity.

Price elasticity crossed between journals and cinema, in each of the 9 provinces of Kohgilooyeh va Boyrahamd, Chahar Mahalo Bakhtiary, Isfahan, Ilam, Fars, Gilan, Hamedan, Yazd, and Zanjan, is negative, that means the goods could substitute for each other in consumption. But, in other provinces, the elasticity is positive; thus, the goods complement each other in consumption. The elasticity for the entire country is equal to -0.12.

The price elasticity crossed between books and cinema for the entire country is -47%. Also, it is negative for each province, which means the two commodities substitute for each other in consumption.

The income elasticity for all the provinces is positive and stands between zero and one; and for the entire country it is 57%, which means going to movies is considered a necessary commodity.

Key words: Iran, Movie industries, Almost Ideal Demand System, Demand for cinema.

1. Introduction

The examination of household consumption from a demand point of view helps to respond to questions such as: "What factors, and up to what degree, affect the demand for a commodity?" and "What is the degree of sensitivity of demand for a commodity in proportion to changes in household income, in commodity price, or in the price of other commodities?" Finding responses to these questions not only clarifies the consumption patterns of the past, but also helps to predict future trends.

Examination of demand for and consumption of cultural commodities including cinema, in Iran, is significant from different angles. First, in recent years the rate of economic growth in Iran has been increasing; a year ago it reached 6.5%, which in future would cause a demand increase for all goods, including cultural commodities. Second, in Iran no movies are produced unless either the government has produced them; has supported their production; or has issued a permit for their production.

Therefore, the study of demand and discovering the degree of influence of different factors on demand helps the policymakers to adopt the required policies to respond to demand growth in future, and since there has been no previous study on household demand for movie going in Iran, the necessity of the study is evident.

2. Objective, Subject and Methodology of Collecting Data and Performing Analysis

The objective of this article is to identify the economic factors that make an impact on demand to go to cinema, and respond to the key question: "What is the demand sensitivity to household income; the ticket price for movies; and the price of other related commodities in different provinces?"

To estimate the demand function, the data related to household expenditures in different provinces in 1984-2005, that are collected annually by Iran's Center for Statistics, are used. The provinces under study are:

1-Booshehr; 2- Kohgilooyeh va Boyrahmad; 3- Chahar Mahalo Bakhtiary; 4- Isfahan; 5-Ilam; 6- Fars; 7- Ghazvin; 8- Gilan; 9- Hamedan;

10-Hormozgan; 11- Kerman; 12- Kermanshah; 13- Khorasan; 14- Kurdistan; 15- Lorestan; 16-Markazi; 17- Mazandaran; 18- Semnan; 19- Sistan;

20- Tehran; 21- Yazd; 22- Zanjan; 23- Eastern Azerbaijan; 24- Western Azerbaijan.

Consumption demand of household is obtained using econometrics techniques and demand equation systems. The applied model is the Almost Ideal Demand System, that is explained in the theoretical framework section.

3. A survey of movie literature in Iran and other countries

About cinema and film there is an expanse of literature. Advertising films in different countries (Andrew, 1984); literature, cinema and their mutual impacts (Cohen,1979; Phillips, 2005); social aspects of movies (Aitken, 1990); the process of the production of movies (Jowett, 1976 & Bernstein,1994); advertising films in Russia and Nazi Germany in WWI (Taylor. 1979); the relations between cinema and other mass media such as television; the culture of consumerism in movies; the role of politics in cinema (Doherty, 2005); movie industries in different countries (Armes,1987; Fox, 2000); silent movies (Burows, 2003); identity and policy making in cinema, with consideration of national characteristics (Lee, 2000; Everett, 2005); religious approaches to cinema; cinema circumstances and general perceptions of the 20th century cinema in different countries, including Germany, Japan, and Australia (Yoshimoto, 2000; Rayner, 2000); identity and nationality in British cinema (Cook,1996); paradigms, socio-historical aspects, conceptualization and policymaking in Indian movies (Chakravarty,1993; Ravis, 2000; Wilson, 2004); a historical survey of cinema in Spain and Portugal, and the role of sex (Faulkner,2004 & Mira,2005; Jordan, 2004); popular cinema in Brazil (Shaw, 2004); American policies on cinema at the beginning of the 20th century (Aronstein, 2006; Grieveson, 2005); a historical examination of Italian cinema, the role of cultural issues, social aspects and sex (Bertellini, 2004); French cinema in the 1970's (Hammond, 2000); the present situation of German cinema (Flinn, 2004); a survey of music and style in the movies of West

Germany (Berghahn, 2005); comedy and drama in Latin American cinema (Mather, 2005); an examination of movie copyrights in European Union (Kamina, 2002); the role of women in movies (British Film Institute, 1988); Cold War, Post Modernism, Realism, and policymaking in Hollywood (King, 2002; Foertsch, 2001; Scott, 2000); popular cinema in India (Raminder, 2005) are among the issues that are reflected extensively in the literature of cinema.

The variety and extensiveness of the subject is not limited to the above. The discussion of national cinema in different countries such as China, Taiwan and Hong Kong in recent years (Zhang, 2004), issues related to urban studies, feminism and the magic ambiance of cinema (Loughline, 2004; Moor, 2005; McCabe, 2004; Chanan, 2004); modernity and cinema (Stewart, 2005); film as a social reality (Turner, 1999); violence and identity in cinema (Becerra, G. 2004); religion and native culture in movies (Griffiths, 2002); new changes in cinema (McCrisken, 2005); entity of cinema (Bazin, 2005); small legends and cultural issues in cinema (Martin, 2001) are other issues to which more attention has been paid in recent years. In fact, so far there is no available comprehensive research about Iranian cinema and particularly its economic aspects, and household demands for movie going.

4. Theoretical Framework: Almost Ideal Demand System

In the 1980's, for the first time, Deaton and Muellbauer introduced the "*Almost Ideal Demand System*" (Deaton & Muellbauer, 1980). This model, just like some other models of demand systems, starts with some expenditure functions, known as PIGLOG[1] expenditure functions. The general form of this expenditure function is:

4-1
$$LnC(U, p) = (1-U)Lna(p) + ULn \quad b(p)$$

In which:
C= Total expenditure;
U= Utility index;
P= Price vector

According to the theory, consumption is a function of utility level and the price vector that is shown as:

 C= C(U, p)

Also, a(P) and b(p) are functions of price levels.

The main characteristic of the expenditure function is its inclusion of expenditure that not only presents the obtainable expenses to reach two levels of the least livelihood and the most welfare, but also includes all the points in between the two levels. Since, according to the theory of consumer behavior, the function of consumer expenditures in proportion to the level of prices shows a homogeneity of the degree one, therefore a(p) and b(p), that are both function of the prices, must be selected so that the results of the algorithm C(U,p), that is a linear composition of the algorithms a(p) and b(p), turn to a homogeneity of degree one. Hence, Deaton and Muellbauer declared Lna(p) and Lnb(p) as:

4-2
$$\ln a(p) = \alpha_0 + \sum_{k=1}^{n} \alpha_k \ln p_k + \frac{1}{2} \sum_{k=1}^{n} \sum_{j=1}^{n} \gamma_{kj} \ln p_k \ln p_j$$

4-3
$$\ln b(p) = \ln a(p) + \beta_0 \prod_{k=1}^{n} p_k^{\beta_k}$$

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[1] - Price- Independent Generalized Linear

p_k is the index price associated to Kth commodity group, n is the number of the commodities existing in the system, and all the α_o, α_k, γ^0_{kj}, are coefficients. K and j represent β_k, β_o groups of commodities. Then, the PIGLOG expenditure function would be:

$$\ln C(U,p) = (1-U)\ln a(p) + U\ln b(p) = \ln a(p) + U\big[\ln b(p) - \ln a(p)\big]$$

$$\ln C(U,p) = \ln a(p) + U\left[\ln a(p) + \beta_o \prod_{k=1}^{n} p_k^{\beta_k} - \ln a(p)\right] = \ln a(p) + U\beta_o \prod p_k^{\beta_k}$$

4-4 $$\ln C(U,p) = \alpha_o + \sum_{k=1}^{n} \alpha_k \ln p_k + \frac{1}{2}\sum_{k=1}^{n}\sum_{j=1}^{n}\gamma^o_{kj}\ \ln p_k \ln p_j + U\beta_o \prod_{k=1}^{n} p_k^{\beta_k}$$

Considering Shephard's Lemma we have:

$$\frac{\partial C(U,p)}{\partial p_i} = qi$$

If we multiply both sides at $\dfrac{p_i}{C}$ then we get:

4-5

$$\frac{\partial C(U,p)}{\partial p_i} \cdot \frac{p_i}{C} = \frac{p_i q_i}{C} \Rightarrow \frac{\partial \ln C(U,p)}{\partial \ln p_i} = w_i$$

In which W_i is the budget share of the ith commodity.
Now we take the derivative of the equation 4-4 to the $\ln p_i$. Thus, we divide the expression to 3 components so that:

$$A = \sum_{k=1}^{n} \alpha_k \ln p_k \qquad B = \sum_{k=1}^{n}\sum_{j=1}^{n}\gamma^o_{kj}\ \ln p_k \ln p_j \qquad D = \prod_{k=1}^{n} p_k^{\beta_k}$$

Therefore:

$$A = \sum_{k=1}^{n} \alpha_k \ln p_k = \alpha_1 \ln p_1 + \ldots + \alpha_i \ln p_i + \ldots + \alpha_n \ln p_n \Rightarrow \frac{\partial A}{\partial \ln p_i} = \alpha_i$$

$$B = \sum_{k=1}^{n}\sum_{j=1}^{n}\gamma^o_{kj}\ \ln p_k \ln p_j = \left[\gamma^0_{11}\ln p_1^2 + \ldots + \gamma^0_{li}\ln p_1 \ln p_i + \ldots + \gamma^0_{1n}\ln p_1 \ln p_n\right]$$

$$+\left[\gamma^0_{21}\ln p_2 \ln p_1 + \ldots + \gamma^0_{2i}\ln p_2 \ln p_1 + \ldots + \gamma^0_{2n}\ln p_2 \ln p_n\right] + \left[\gamma^0_{il}\ln p_i \ln p_1 + \gamma^0_{i2}\ln p_i \ln p_2 + \ldots + \gamma^0_{in}\ln p_i \ln p_n\right]$$

$$+\ldots+\left[\gamma^0_{n1}\ln p_n \ln p_1 + \ldots + \gamma^0_{nn}\ln p_n^2\right]\frac{\partial B}{\partial \ln p_i} = \gamma^0_{li}\ln p_1 + \gamma^0_{2i}\ln p_2 + \ldots + \gamma^0_{il}\ln p_1 + \gamma^0_{i2}\ln p_2 +$$

$$\ldots+2\gamma^0_{li}\ln p_i + \ldots + \gamma^0_{in}\ln p_n + \ldots + \gamma^0_{in}\ln p_n$$

$$\frac{\partial B}{\partial \ln p_i} = \left[\gamma^0_{li} + \gamma^0_{il}\right]\ln p_1 + \left[\gamma^0_{2i} + \gamma^0_{i2}\right]\ln p_2 + \ldots 2\gamma^0_{il}\ln p_i + \ldots + \left[\gamma^0_{in} + \gamma^0_{ni}\right]\ln p_n$$

$$\gamma_{ij} = \frac{\gamma_{ij}^0 + \gamma_{ji}^0}{2} \Rightarrow \gamma_{ij}^0 + \gamma_{ji}^0 = 2\gamma_{ij}$$

$$\Rightarrow \frac{\partial B}{\partial \ln p_i} = 2\gamma_{i1} \ln p_1 + 2\gamma_{i2} \ln p_2 + \ldots + 2\gamma_{ij} \ln p_i + \ldots + 2\gamma_{in} \ln p_n = 2\sum_{i=1}^{n} \gamma_{ij} \ln p_j$$

$$D = \prod_{i=1}^{n} p_k^{\beta k} = p_1^{\beta_1} \cdot p_2^{\beta_2} \ldots p_i^{\beta_i} \ldots p_n^{\beta_n}$$

Since we know that:

$$\frac{\partial D}{\partial \ln p_i} = \frac{\partial D}{\partial p_i} \cdot \frac{\partial p_i}{\partial \ln p_i}$$

$$\frac{\partial \ln p_i}{\partial p_i} = \frac{1}{p_i} \Rightarrow \frac{\partial p_i}{\partial \ln p_i} = p_i$$

So:

$$\frac{\partial D}{\partial \ln p_i} = \beta_i \cdot p_i^{\beta_1} \ldots p_i^{\beta_1^{-1}} \ldots p_n^{\beta n} \cdot p_i = \beta_i \prod_{k=1}^{n} p_k^{\beta_k}$$

And therefore:

$$\frac{\partial \ln C(U,p)}{\partial \ln p_i} = \alpha_i + \frac{1}{2}(2\sum_{j=1}^{n} \gamma_{ij} \ln p_j) + U\beta_o \beta_{i_{k=1}}^n \prod p_k^{\beta k} = W_i$$

4-6 $\quad \Rightarrow W_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + U\beta_o \beta_i \prod_{k=1}^{n} p_k^{\beta k}$

But the important point is that the derived function of the share above and its corresponding demand function are in fact compensated functions because they are derived from Shephard's Lemma. Also, the general form of the function 4-6 expresses the same point. Since it is a function of the level of prices and utility, this compensated function must be transformed to a corresponding function of un-compensated demand.

If, from the above relation, we derive U based on M and p, then we reach the indirect function of utility, and then we get the uncompensated function. In order to do that, using the relation 4-4, we calculate U in respect to M and p, and include that in the function 4-6 to reach the intended results. Thus:

C(U,p)=M $\quad$ ln C(U,p) = ln M

$$\ln M = \alpha_o + \sum_{k=1}^{n} \alpha_k \ln p_k + \frac{1}{2}\sum_{k=1}^{n} \sum_{j=1}^{n} \gamma_{kj}^0 \ln p_k \ln p_j + U\beta_o \prod_{k=1}^{n} p_k^{\beta_k} \Rightarrow$$

With inclusion of this expression in function 4-6 we get:

$$W_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \left[\ln M - \alpha_o - \sum \alpha_k \ln p_k - \frac{1}{2}\sum_{k=1}^{n} \sum_{j=1}^{n} \gamma_{kj}^0 \ln p_k \ln p_j \right]$$

$$\Rightarrow W_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln M - \beta_i \left[\alpha_o + \sum_{k=1}^{n} \alpha_k \ln p_k + \frac{1}{2}\sum_{k=1}^{n} \sum_{j=1}^{n} \gamma_{kj}^0 \ln p_k \ln p_j \right]$$

If we declare the bracketed expression in ln p, then:

$$\ln p = \alpha_o + \sum_{k=1}^{n} \alpha_k \ln p_k + \frac{1}{2}\sum_{k=1}^{n} \sum_{j=1}^{n} \gamma_{kj}^0 \ln p_k \ln p_j$$

Therefore:

$$W_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln M - \beta_i \ln p$$

7-4 $\quad W_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln(M/P)$ $\qquad\qquad \forall_i = 1.2.....n$

The above expression is the *Almost Ideal Demand System* of equations. The important point in this system is that considering the price index p the coefficients of the above equation are non-linear, and to estimate the coefficients non-linear methods must be applied. This requires sufficient data and statistics. Therefore, in most empirical studies, instead of using the real index of p and non-linear method, the Stone index is used as a substitute for the real index p, and thus the model is turned linear and could be easily estimated using linear methods. Related case studies confirm that estimations using the Stone index and the real index p have little difference, hence, it is recommended to use the Stone index in empirical studies. The Stone index is declared as:

$$\ln p_t^0 = \sum_{j=1}^{n} w_{jt} \ln p_{jt}$$

And with this inclusion, the model turns to:

4-8 $\qquad W_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + p_i \ln\left(\frac{M}{p^0}\right)$

The amount of p^0 is calculated for each period and is inserted in the model as a specified amount. The relation 4-8 is known as Linear Approximate AIDS (LA-AIDS).

The most important reason to select the Almost Ideal Demand System of equations is that the estimation of the model as an approximation is very simple, and the existence or non-existence of the homogeneity and symmetry restrictions can be tested, and since our data and statistics are based on household expenditures, it's fitting based on the household expenditure does not alter the functional form of the model.

6. An examination of the demand for cinema in different Provinces
According to the above materials, using the Almost Ideal Demand System of equations, the demand function for different cultural commodities, including cinema, was estimated. In this article the demand function for cinema is studied. If we show the expenditure of the household for cinema; the average ticket price; the average journal price; the average book price; the real income of the household; and the index of prices respectively as W1, P1, P2, P3, eReal, and Po, in each of the provinces, the results of the estimation of the demand for each of the provinces would be:

1-Booshehr;
W1 = 0.59488_0.91Lnp1 _0.47Lnp2+0.112LnP3
$\quad$ (2/8) $\quad$ (-15/5) $\quad$ (-0/93) $\quad$ (_8.89)
- 0/001958 Lnpo - 0/00532 Ln (eReal) + 279266/1 W1 (-1)
$\quad$ (-1/43) $\qquad$ (-2/93) $\qquad\qquad$ (27/28)

$\quad$ R2 = 0/94 $\qquad$ R-2 = 0/90 $\qquad$ D.W = 2/5

2-Kohgilooyeh va Boyrahmad;
W1 = 0.345 + 000256/0+Lnp1 – 0000197/0 Lnp2 -0/000333Lnp3

$$(0/2) \quad (2/64) \quad (-0/46) \quad (-4/56)$$

$$0/000812 \ Lnpo - 0/00000592 \ Ln \ (eReal) + 0/093847 \ W1 \ (-1)$$

$$(0/9) \quad (-2/044) \quad (6/73)$$

$$R2 = 0/91 \qquad R\text{-}2 = 0/89 \qquad D.W = 2/47$$

3- Chahar Mahal va Bakhtiary;

$$W1 = -0/00193 \quad 000145/0 + Lnp1 - 000129/0 \ Lnp2 - 0/000184 Lnp3$$

$$(-1/14) \quad (1/84) \quad (-1/35) \quad (-2/47)$$

$$0/000151 \ Lnpo - 0/0000922 \ Ln \ (eReal) + 0/093847 \ W1 \ (-1)$$

$$(1/62) \quad (-2/14) \quad (7/63)$$

$$R2 = 0/86 \qquad R\text{-}2 = 0/84 \qquad D.W = 2/13$$

3- Isfahan;

$$W1 = -0/09154 - 0/000545 \ Lnp1 + 0/015645 \ Lnp2$$

$$(-3/94) \quad (-3/76) \quad (7/46)$$

$$-0/013492 \ Lnp3 - 0/000746 \ Lnp - 0/0099 \ Ln \ (eReal) + 0/093847 \ W1 \ (-1)$$

$$(-7/68) \quad (-0/44) \quad (-5/05) \quad (3/54)$$

$$R2 = 0/91 \qquad R\text{-}2 = 0/89 \qquad D.W = 1/94$$

5-Ilam;

$$W1 = -0/082164 - 0/003706 \ Lnp1 + 0/01483 \ Lnp2$$

$$(84/3) \quad (55/2-) \quad (19/1-)$$

$$-0/022379 \ Lnp3 - 0/001811 \ Lnp - 0/009072 \ Ln \ (eReal) + 0/267614 \ W1(1)$$

$$(-5/54) \quad (-0/33) \quad (-2/64) \quad (1/91)$$

$$R2 = 0/92 \qquad R\text{-}2 = 0/89 \qquad D.W = 1/94$$

6- Fars;

$$W1 = -0/136491 - 0/003582 \ Lnp1 + 0/00371 \ Lnp2 - 0/008184 \ Lnp3$$

$$(-1/94) \quad (2/16) \quad (-2/4) \quad (-1/97)$$

$$- 0/008625 \ Lnpo - 0/004116 \ Ln \ (eReal) + 0/093847 \ W1 \ (-1)$$

$$(2/31) \quad (2/04) \quad (6/48)$$

$$R2 = 0/90 \qquad R\text{-}2 = 0/88 \qquad D.W = 1/94$$

7- Ghazvin;

$$W1 = 0/00273 + 0/000965 \ Lnp1 + 0/000243 \ Lnp2 - 0/0000429 \ Lnp3$$

$$(1/33) \quad (2/88) \quad (-2/6) \quad (-0/34)$$

$$+ 0/000179 \ Lnp - 0/00000112 \ Ln \ (eReal) + 0/093847 \ W1 \ (-1)$$

$$(2/14) \quad (-3/12) \quad (6/53)$$

$$R2 = 0/92 \qquad R\text{-}2 = 0/90 \qquad D.W = 2.2$$

8- Gilan;

$$W1 = -0/156134 - 0/0000015 \ Lnp1 + 0/0073 \ Lnp2 - 0/005195 \ Lnp3$$

$$(-4/2) \quad (-9/34) \quad (10/98) \quad (-8/9)$$

$$-0/002664 \ Lnp - 0/00218 \ Ln \ (eReal) + 0/093847 \ W1 \ (-1)$$

$$(-1/14) \quad (-5/92) \quad (10/33)$$

R2 = 0/87   R-2 = 0/85   D.W = 1/98

9- Hamedan;

$W1 = -0/10005 + 0/005222\ Lnp1 - 0/006452\ Lnp2 - 0/007086\ Lnp3$
     (-1/63)   (1/84)   (-3/12)
$0/007974\ Lnp + 0/008859\ Ln\ (eReal) + 0/906854\ W1\ (-1)$
(-2/09)   (2/26)   (-1/74)   (7/53)

R2 = 0/86   R-2 = 0/84   D.W = 1/99

10- Hormozgan;

$W1 = -0/0119 - 0/00135\ Lnp1 + 0/000225\ Lnp2 - 0/000265\ Lnp3$
     (-0/72)   (-2/21)   (1/84)   (-2/23)
$- 0/0000961\ Lnp - 0/00000015 Ln\ (eReal) + 0/093847\ W1\ (-1)$
          (-0/91)   (-2/11)   (2/23)

R2 = 0/84   R-2 = 0/8   D.W = 1/96

11- Kerman;

$W1 = -0/00166 - 0/000139\ Lnp1 + 0/000209\ Lnp2 - 0/000204\ Lnp3$
     (-1/18)   (-1/96)   (2/37)   (-2/22)
$- 0/000108\ Lnp - 0/000179\ Ln\ (eReal) + 0/093847\ W1\ (-1)$
(-1/42)   (-2/55)   (1/62)

R2 = 0/87   R-2 = 0/84   D.W = 2/17

12- Kermanshah;

$W1 = -0/00151 - 0/000158\ Lnp1 + 0/000252\ Lnp2 - 0/000281\ Lnp3$
     (-1/35)   (-2/57)   (2/85)   (-2/82)
$- 0/000151\ Lnp - 0/000184 Ln\ (eReal) + 0/1086272 W1\ (-1)$
 (-2/07)   (-2/005)   (5/36)
R2 = 0/91   R-2 = 0/89   D.W = 1/94

13- Khorasan;

$W1 = 0/050908 - 0/00000112\ Lnp1 + 0/00154\ Lnp2 - 0/002915\ Lnp3$
     (6/84)   (-4/13)   (4/46)   (-3/36)

$- 0/012906\ Lnp - 0/000433\ Ln\ (eReal) + 0/074876\ W1(-1)$
 (-6/05)   (-2/86)   (0/65)

R2 = 0/84   R-2 = 0/8   D.W = 2/7

14 Kurdistan;

$W1 = -0/00293 - 0/000228\ Lnp1 + 0/0000128\ Lnp2 - 0/0000915\ Lnp3$
     (-2/73)   (-3/84)   (0/18)   (2/1)

- 0/00000117 Lnp - 0/000271 Ln (eReal) + 0/044431W1 (-1)
 (0/16)   (-3/17)   (3/58)

R2 = 0/93   R-2 = 0/9   D.W = 2/66

15- Lorestan;
W1 = -0/05444 - 0/00000685 Lnp1 + 0/0118 Lnp2   -0/004141 Lnp3
      (-1/26)   (-3/19)   (5/33)   (-5/22)

- 0/000777 Lnp - 0/004638Ln (eReal) + 0/456348 W1 (-1)
 (-0/33)   (-1/8)   (3/3)

R2 = 0/86   R-2 = 0/82   D.W = 2/65

16- Markazi;
W1 = -0/217 - 0/000000111Lnp1 + 0/00713 Lnp2   -0/010843 Lnp3
      (-2/42)   (-2/54)   (3/84)   (-2/52)

- 0/003437 Lnp - 0/003121 Ln (eReal) + 0/18 W1 (-1)
 (-0/66)   (-2/89)   (5/98)
R2 = 0/86   R-2 = 0/84   D.W = 2/77

17- Mazandaran;
W1 =- 0/00221 - 0/000129 Lnp1 + 0/000255 Lnp2   -0/000287 Lnp3
  (-2/73)   (-3/84)   (0/18)   (2/1)
- 0/0000555 Lnp - 0/000244 Ln (eReal) + 0/4247 W1 (-1)
     (-6/05)   (-2/86)   (0/65)
R2 = 0/87   R-2 = 0/84   D.W = 3/2

18- Semnan;
W1 =- 0/123016 - 0/001091 Lnp1 + 0/000687 Lnp2   -0/019769 Lnp3
        (-2/11)   (3/4)   (-0/31)   (-4/47)

- 0/008608 Lnp - 0/001073 Ln (eReal) + 0/013847 W1 (-1)
 (2/43)   (-2/28)   (8/05)

R2 = 0/87   R-2 = 0/82   D.W = 31/2

19- Sistan;
W1 = -0/223782 - 0/001248 Lnp1 + 0/0137 Lnp2   -0/013622 Lnp3
      (-3/4)   (3/88)   (3/32)   (-3/39)

- 0/009415 Lnp - 0/002212 Ln (eReal) + 0/399447 W1(-1)
 (2/27)   (-3/99)   (-2/23)

R2 = 0/87   R-2 = 0/81   D.W = 2/68

20- Tehran;
W1 = 0/196808 - 0/000000122 Lnp1 + 0/0000916 Lnp2 -0/005979 Lnp3
    (4/04)   (-6/39)   (0/073)   (-3/73)

- 0/00 7643 Lnp - 0/005154 Ln (eReal) + 0/1676545 W1 (-1)
 (-3/42)   (-3/92)   (10/39)
R2 = 0/91   R-2 = 0/88   D.W = 2/4

21- Yazd;
W1 =- 0/141354 +0/005084 Lnp1 - 0/00377 Lnp2 -0/01021 Lnp3
    (-3/07)   (2/63)   (-2/11)   (-3/37)

+ 0/00912 Lnp - 0/001168 Ln (eReal) + 0/1329458 W1 (-1)
 (3/1)   (-3/08)   (9/24)
R2 = 0/87   R-2 = 0/81   D.W = 2/38

22- Zanjan;
W1 = 0/068476 - 0/0000000134 Lnp1 - 0/00281 Lnp2 -0/008127 Lnp3
    (6/84)   (-4/13)   (4/46)   (-3/36)

- 0/000999 Lnp - 0/005285 Ln (eReal) + 0/1492395 W1 (-1)
 (-6/05)   (-2/86)   (0/65)
R2 = 0/82   R-2 = 0/8   D.W = 2/21

23- Eastern Azerbaijan;
W1 = -0/00166 - 0/000139 Lnp1 + 0/000209 Lnp2 -0/000204 Lnp3
     (-1/18)   (-1/96)   (2/37)   (-2/22)
 - 0/000108 Lnp - 0/000179 Ln (eReal) + 0/093847 W1 (-1)
  (-1/42)   (-2/55)   (1/62)

      R2 = 0/87   R-2 = 0/84   D.W = 2/17

24- Western Azerbaijan
W1 = 0/050908-0/00000112Lnp1 + 0/00154 Lnp2 -0/002915 Lnp3
   (6/84) (-4/13)   (4/46)   (-3/36)

- 0/012906 Lnp - 0/000433 Ln(eReal) + 0/074876 W1 (-1)
 (-6/05)   (-2/86)   (0/65)

 R2 = 0/84   R-2 = 0/82   D.W = 2/6

As is observed, all the variables being studied are statistically meaningful. In this model, the amounts of demand shares for the previous period W(-1) are statistically meaningful, which shows stickiness of consumption and formation of the behavior of the consumer. The coefficient of this variable is often negative and shows that over time and with stability of the circumstances, consumers show a trend to reduce their consumption. The amount of the statistic D.W. shows that auto-correlation of degree one does not exist among the distortion

expressions (it is evident that in usual conditions auto-correlation among the expression of distortion had existed and that by introducing AR (1) into the model, it is corrected). The amount of R2 obtained from the model shows the suitability of the model and in all cases it is more than 82% that implies more than 82 percent of the change in demand is explained by the independent variables that are introduced in the model. The amount of R-2 , which in fact is the adjusted amount of the statistic R2 based on the independent variables is also in all the cases at a high level. Thus, almost all models are estimated properly and the resultants are reliable.

7. Demand for cinema in the entire country
$W1 = 0.222865 - 0.002692\, Lnp1 - 0.006569\, Lnp2\ -0.008427\, Lnp3$
  (5.4)   (2.23)   (3.73)   (-3.9)

$- 0.014818\, Lnp - 0.016596\, Ln\, (eReal) + 0.469129\, W1\, (-1)$
(-4.8)   (-5.1)   (3.49)

R2 = 0.97   R-2 = 0.92   D.W = 2.44
As is observed, all the variables under study exert a statistically meaningful impact on the demand share. In this model the amount of the demand share of the previous period has a statistically meaningful effect on the demand in current period. This implies stickiness of consumption and formation of consumer behavior. The amount of the statistic D.W. shows there is no auto-correlation of degree one among the distortion expressions. The amount of R2 resulted by the model is equal to 97%, which not only proves the suitability of the model but also shows that almost 97% of the changes in demand are explained by independent variables introduced in the model. The amount of R-2 that in fact is the adjusted amount of statistics R2 in respect to the independent variables, is also at a high level. On this ground, the resultants of the model show that the model is overall well estimated and the resultants are reliable.

8. Conclusions
In this article the demand functions for going to the cinema, in different provinces, are estimated based on the statistics and data pertaining to household expenditures.
According to the obtained results, with exception of Isfahan, Hormozgan, Kerman, Kurdistan, Mazandaran and Eastern Azerbaijan, the price elasticity is less than one, which means demand is not sensitive to price variations. The same elasticity for the entire country is -0.91, which is almost equal to one and shows low elasticity of the commodity in household consumption. The amount of the elasticity shows that in case of a 100% increase in the ticket price for cinema, keeping other factors constant, demand for cinema would decrease by 91 percent.
Cross elasticity of price for journals and cinema in the 9 provinces of Kohgilooyeh va Boyrahmad, Chahar Mahalo Bakhtiary, Isfahan, Ilam, Fars, Gilan, Hamedan, Yazd and Zanjan is negative, which means these two commodities could substitute each other in consumption. But in other provinces the elasticity is positive, which means these two commodities complement each other in consumption. The important point is that in both states the absolute value of the elasticity is very small and almost zero, which means the relation between journals and cinema is very weak. The same elasticity for the entire country is -0.12, which means in the country, in general, two commodities of cinema and journals substitute

each other in consumption. In fact, if the journal price is increased by 100%, the demand for cinema is reduced by 11%.

Cross elasticity of price between books and cinema, in every province, is negative. This means in all the provinces these two commodities substitute for each other. This elasticity for the provinces of Chaharmahalo Bakhtiary, Isfahan, Fars, Gilan, Hamedan, Kurdistan, Lorestan, Tehran and Zanjan is more than for the other provinces. The amount of cross elasticity between the two commodities in demand function of cinema in the entire country is almost -47%; that shows, if book prices increase by 100% and all other factors are kept constant, demand for cinema will decrease by 47%. In other words these two goods are complementary in consumption.

The income elasticity in each of the provinces is positive; it is between zero and one. The income elasticity expresses the degree of sensitivity of demand in proportion to variations in household income. The amount of income elasticity for this commodity in the entire country is equal to 0.57, which means if the income of a household increases by 100%, demand for this commodity would increase by 57%. On this basis, this is a necessary commodity and if household income increases, expenditure on cinema would increase by a lesser amount.

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