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Evaluating the Advertising Effect on Qard Hassan Demand Deposits in Iranian Governmental Banks

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Abstract: Attracting financial resources via deposits can help banks to achieve a country's economic aims of growth and development. Advertising is a useful and effective economic factor that can increase bank deposits. The aim of this study is to evaluate the effect of advertising on the development of Qard Hasan demand deposits, using 2000-2004 data from Iranian governmental banks. In this article, using a time-varying parameter model, we investigated the effects of factors that affect advertising and the attraction of Qard Hasan demand deposits (QHD) in Iranian governmental banks. Results reveal that the average of advertising elasticity in Maskan Bank (MSB), Refah Bank (RB), Tosse Saderat Bank (TSB), Melat Bank (MTB), Tejart Bank (TB), Sepah Bank (SPB), Keshavarzi Bank (KB), Meli Bank (MB), Saderat Bank (SB) and Sanat VA Madan Bank (SMB) is 0.74, 0.65, 0.62, 0.6, 0.6, 0.58, 0.57, 0.51, 0.43 and 0.18, respectively.

Key words: Advertising · Econometric model · Governmental banks · Qard Hasan demand deposit (QHD) · Time-varying parameter model

INTRODUCTION

Banks are one of the most important economic institutions offering financial services for household and economic activities (Agents), with a special role in a country's economic system. Thereby, the role of governmental banks in most countries is as an instrument for exerting the development of governmental policies, attracting private sector participation and transacting money and financial resources for production activities.

Governmental banks aim to attract social private capital (mobilization of deposit) and develop the investment on production activities in subsectors of the economy. Furthermore, attracting deposits can play an important role in the economic growth and development in the country. Economic, social and cultural factors also can affect the incentive for a QHD.

Qard Hasan demand deposits (QHD) in the Islamic financial system are deposits with a zero interest rate. Valuable gifts and moral incentives influence their attraction. In fact, this deposit is used to help everyone who needs it. Achieving profits, achieving gifts, saving for retirement, the necessary duration, securing the loan, a cash salary from the bank, cultural and ideal beliefs about Qard Hasan demand deposits and the importance of contentment, trade and advertising are incentives for the deposit by households.

Knowledge about of these factors for future planning of the bank system will help to increase its efficiency. On the other hand, mobilizing credit resources to maintain and increase production in the economic sectors (agriculture, industry and services) and investment in its related industries provides a needed, assured and adequate resource.

Iranian governmental banks (with more than 90% of the Iranian money market) consist of two categories. Commercial and non-commercial banks, during the last few years, aimed to improve mobilization of QHD with activities such as adding bank branches, increasing the QHD gift value and advertising.

Kesharvarzi Bank (KB), Sanat va Madan Bank (SMB), Tosse Saderat Bank (TSB) and Maskan Bank (MSB) are non-commercial banks that develop investments on agriculture, industry and mining, non-oil export and abode sectors, respectively. Meli Bank (MB), Melat Bank (MLB), Tejart Bank (TB), Saderat Bank (SB), Refah Bank (RB) and Sepah Bank (SPB) are in the commercial category that falls to investment in all economic sectors.

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With reforms to increase the attraction of QHD in governmental banks (adding bank branches, increasing the QHD gift value and advertising), the quantity has increased from 22,155 billion rials (Local Currency, Rls) in 2000 to 72,791 billion Rls in 2004 (2.86 times increase). Meli Bank, with 10,273 billion Rls growth (3 times increase), has had the most growth in attracting QHD.

To attract more deposits, the number of governmental bank branches has increased from 15,252 in 2000 to 16,076 branches in 2004. Keshavarzi Bank has experienced the most growth in branch establishments, with 273 branches growth (1.28 times increase) [1].

Based on the increasing trend in attraction of governmental banks QHD and the outcome of advertising, an assessment of factors that can affect demand deposits and their effects on a country's financial market is necessary.

Many studies worldwide have assessed the factors that can affect demand deposits and their effects on developing a country's financial market. Hammond [2] in his research, "Credit Card Credit and Demand for Deposit", evaluated affective factors on demand for deposit. His results demonstrate that per capita permanent income, interest rate of the deposit, interest rates of other deposits and credit card credit are significant on demand for deposit.

Brox and Schroeder [3] analyzed demand for deposit and risk sensitivity for four types of deposits in Greece, using gamma density function. Results show that a foreign currency deposit has the highest elasticity in response to changes in expected interest rates and that those accounts are viewed as the most risky of four forms analyzed. Samuel and Chase [4] estimated the demand for household savings deposits, considering the effects of per capita permanent real income, the interest rate of a savings deposit, the interest rate of other deposits and demand insurance (as a dummy variable) on a demand for savings deposit. Adams. Roller and Sickle [5] estimated market power on bank inputs and outputs, applying deposit supply and loan demand functions simultaneously. Population, the number of branches, income, the number of bank personnel, bank assets and facility loans are factors that affect deposit supply and loan demand.

In Iran, studies to evaluate the effect of factors on demand deposit are rare. Rezaei [6] assessed factors that affect the mobilization of diverse deposits in banks, using Friedman analysis and independent pattern testing. Results indicated that the quantity of services and the place and position of bank branches can attract a deposit.

Advertising is one of the most effective factors to attract QHD. Evaluation of generic commodity promotion programs is a necessary component of managing producer check-off dollars to determine the net benefits to producers. One component of such an evaluation requires estimating the demand effects of generic advertising programs [7] every year; countries spend a lot of money on commodity and services advertising. For example, in 2000, advertising expenditure in England and Germany has been estimated at 15.798 and 21.615 billion euros, respectively [1].

Advertising expenditures are an inseparable factor from production cost (as classic economic) or marketing cost (in institutional economic) [1]. The advertising effect on commodities and services demand, have evaluated around the world. Venkateswaren and Kinnucan [8] examined the estimated effects of milk advertising in an Ontario market using different functional forms (double log, semi log, log inverse and inverse). Although results from these four demand functions suggest that generic advertising has increased the milk consumption in Ontario, there are significant differences among the effects of generic milk advertising estimated on these four forms. The inverse form best describes the relationship between advertising and sales in the milk market. Lenz, Kaiser and Chung [9] developed a conceptual model to evaluate the economic impact of generic milk advertising on markets in New York State. The double log demand function estimates the empirical results.

Brester and Andrikopoulos [10] argued that cross-advertising effects should be considered when evaluating the effects of advertising in a group of commodities such as meat and dairy products. Thus, instead of using a single-equation demand function, they used a demand system — the non-linear Rotterdam model — which can take into account both the own and cross-advertising effects to measure the impact of advertising on the demand for meat products.

In addition to generic advertising, this research also evaluated the effect of branded advertising on meat demand. Schmitt and Kaiser [7], using a time-varying parameter model, had evaluated the impact of branded and generic advertising on fluid milk and cheese.

The generic advertising parameter, during the time, is variable and is a function of other factors. In this study, advertising elasticity is less than one. Advertising response elasticity indicates that generic advertising could be enhanced by targeting young children's households for fluid milk and Asian/Hispanic households for cheese. Results also show that targeted advertising for

the away-from-home market may increase the generic cheese advertising response. Chung and Kaiser [11] developed a time-varying model to specify advertising parameter as a function of advertising strategies and market environment (particularly, demographic factors that play important roles in determining of advertising effectiveness).

The aim of this study is using the empirical model to evaluate the effect of advertising planning on QHD in Iranian governmental banks. Estimation of QHD demand function and assessment of factors that can affect advertising response are our other aims.

A description of the conceptual model is provided, followed by an empirical application to the Iranian demand for QHD. Time-varying demand elasticities are then highlighted. Finally, we calculate advertising response and elasticities of other variables. We close with some concluding remarks.

CONCEPTUAL MODEL

In this section, we present the proper method for demand for QHD in the Iranian governmental bank system and then consider the effects of factors on it. This study is based on Schmitt and Kaiser [7] model in relation to the Iranian QHD market.

Previous evaluations of advertising planning consider commodity markets with a constant parameter model. The economic structure of societies (with demographic, economic, social and political properties) varies during the time, so the constant parameter assumption is amiss. QHD demand function is similar to any commodity and services demand introduces the following:

$$D_t = a_0 + a' X'_t + a_t ADV_t + e_t \quad (1)$$

Where D_t is product disappearance at time period t $(t=1,....T)$, X'_t is k-dimensional vector of an explanatory variable other than advertising (like price and income) and ADV_t is goodwill stock of brand expenditures. Also, α_0, α' and α_t are parameters to be estimated and ε_t is a random disturbance term with mean zero and s_e^2 variance.

There are several approaches to assess the advertising impact on commodity or services demand function. The time-varying parameter model is useful because of variation in social economic structures [7]. In this model, the impact of advertising changes during the time due to consumption accustomed to special problems that present in advertising. While the advertising coefficient varies during the time, advertising goodwill parameter is described as:

$$a_t = F(z_t) + v_t \quad (2)$$

Where $F(.)$ presents functional form[1], z_t is a vector of explanatory variables assumed to affect consumer advertising response and v_t is a random disturbance term with mean zero and d_v^2 variance.

EMPIRICAL SPECIFICATION

On comparing several models, specifically the linear and logarithmic models and using the Ramsey regression equation specification error test (Reset) and Jarque-Bera normality test, we elected the nonlinear model (Equation (3)) as the best model for the evolution of advertising effects on demand for QHD in the Iranian governmental bank system. Demand for QHD model is specified as:

$$\begin{aligned} Ln(De_{it}) &= a_0 + a_1 Ln(R_{it}) + a_2 Ln(In_t) \\ &+ a_3 Ln(NBR_{it}) + a_4 Ln(T) \\ &+ \varphi_{it} Ln(ADV_{it}) + e_{it} \end{aligned}$$

$$\begin{aligned} \varphi_{it} &= (d_0 + d_1(In_t) + d_2(R_{it}) \\ &+ d_3(NBR_{it}) + d_4(SH_t) \\ &+ d_5(Ag15\text{-}30_t) + d_6(Ag30\text{-}45_t) \\ &+ d_7(GIF_{it})) + v_{it} \end{aligned} \quad (3)$$

where, De_{it} is quantity of QHD demand, In_t is Income per capita, R_{it} is weighted summation of other deposits interest rate of via weight of long-and short-term deposits, NBR_{it} is number of bank branches, T is a time trend and ADV_{it} is goodwill advertising. SH_t, $Ag15\text{-}30_t$ and $Ag30\text{-}45_t$ are urban population, percentage of population 15 through 30 years and percentage of population 30 through 45 years, respectively. GIF_{it} describes the gift value of QHD. Subscript t $(t=1,2,3,4,5)$ and i $(i=1,2,...,10)$ are period of time and type of governmental banks (MB, MLB, TB, SPB, RB, KB, SMB, TSB and MSB). Also, α_0, α_1, α_2, α_3, α_4, δ_0, δ_1, δ_2, δ_3, δ_4, δ_5, δ_6 and δ_7 are parameters to be estimated and e_{it} is a random disturbance term with mean zero and d_{it}^2 variance. φ_{it}^m is a parameter of advertising that varies during the time.

In Equation (3), we have two category variables (direct variables and indirect variables). Because the gift variable has significance only with advertising, this

indirect variable affects QHD demand. Urban population, percentage of population from 15 through 30 years and population in age 30-45 are similar to the gift variable, in that all of these variables have an indirect effect on QHD demand.

DATA

The data are national, annual and encompass the time period from 2000 through 2004 in 10 Iranian governmental banks. Advertising expenditure, QHD, Income per capita and the gift value of QHD were deflated by the consumer price index (CPI) in respect to 1996. The Interest rate of other deposit reckon via the weight average of long-and short-term deposit interest rates (weights are quantities of long-and short-term deposits). Regarding the quantity of QHD, we averaged its month remainder that names "QHD cost".

According to 534 Act, 1985, Iranian Money and Credit Council determines the maximum level of QHD gross gift for every bank (commercial and non-commercial), which is 2% of QHD cost. Based on this Act, 2% of QHD gross gift spent for advertising, 2% of QHD gross gift spent for public works (construction, mobilization and school renovation) that liquidates to the central bank of Iran, 3% spent for bank personnel as bonus and reward and 90% residual is the net cost of the gift spent (Act of QHD gift confer, 1992).

According to this fact that because the value of QHD gift is 2% of QHD and the value of advertising is 2% of QHD gift, we can reckon this variable (gift and advertising). To estimate Equation (3), we used annual growth because of similarity between the gift value and advertising expenditure. Also, according to econometric theories, we were able to estimate this model, although we could not estimate previous variables of gift and advertising due to collinearity with QHD cost.

As well, we used population in age 15-30and from 30 through 45 years as demographic variables for two reasons. First, due to lack of data, we could not use detailed ages. Second, these two age segments make up the highest percentage of the Iranian population (approximately 50%). Structural changes in these two ages' segments can affect QHD. These variables are very important and are used in most Iranian economic studies. The urban population in Iran has special characteristics that affect its economic social proprieties. All of variables are described in Table 1.

RESULTS

Equation (3) was estimated using *non-linear maximum likelihood* (NL) by *Shazam* software. To determine multi-collinearity relation, hetroskedasticity and autocorrelation, we used the *variance decomposition test*, *Breush-Pagan* and *Glejser tests* and *Durbin-Watson*, respectively. We used the *t* test for the significance level of variable determination. Because of the lack of a long-run data series for every bank, we used a collection of banks' data in one model. In fact to obviate the lack of data, we used one equation and estimated this equation with pooling data (10 banks in 5 years). Subscript of the variables shows the time and bank. Table 2 indicates the coefficient and significance level of the empirical model.

According to Table 2, all of the variables are significant in 1%, but gift value is significant in a higher confidence interval. Regarding signs of variables, the positive effect of Income per capita on QHD demand and advertising response is considerable. We observed the positive effect of the number of branches on QHD demand. However, we should discuss the negative effect in advertising response and pay attention to its small coefficient. Regarding the interest rate of other deposit variables (as the price of substitution commodities and

Table 1: Variables used in equation (3) during 2000-2004

Variable	Description	Units	Average
De_{it}	QHD cost in Iranian governmental banks deflated by CPI	bil Rls	1436.10
R_{it}	Interest rate of other deposit reckoned via weight average of long-and short-term deposit interest rates	%	12.56
In_t	Income per capita deflated by CPI	mil Rls	0.80
NBR_{it}	Number of Iranian governmental bank branches	-	-
GIF_{it}	Value of QHD gift deflated by CPI	mil Rls	28.14
ADV_{it}	Advertising expenditure of QHD deflated by CPI	bil Rls	0.58
SH_t	Urban population	%	66.12
$Ag30\text{-}45_t$	Population from 15 through 30 years	%	35.22
$Ag30\text{-}45_t$	Population from 30 through 45 years	%	10.78

Source: Statistical Issue [1]

Table 2: Estimation of the empirical equation (3)

Variables	Coefficient	Quantity	SE	t Static's
Intercept	α_0	8698.9 ***	0.9965	8729.4
Income per capita	α_1	4.7338 ***	1.3723	3.4496
Interest rate of other deposits	α_2	-7.0743 ***	1.1085	-6.3821
Numbers of branches	α_3	0.7752 ***	0.13367	5.7999
Trend	α_4	-1197.7***	0.80329	-1491
Intercept	δ_0	-61.743 ***	1.5205	-40.606
Income per capita	δ_1	82.429 ***	1.0002	82.409
Interest rate of other deposits	δ_2	0.04602 ***	0.011583	3.9732
Numbers of branches	δ_3	-0.00007 ***	0.000033	-2.11
urban population	δ_4	0.17085 ***	0.23275	7.3405
percentage of population 15 through 30years	δ_5	-9.3583 ***	0.69323	-13.499
percentage of population 30 through 45years	δ_6	35.203 ***	2.2434	15.692
Value of QHD gift	δ_7	0.00002	0.000067	0.31242
	0.982 D.W=1.9= $\overline{R}^2$ 0.986 = R^2			

*** = 0.01 level (1%), ** =0.05 level (5%)

Source: Own Results

services), the sign of its coefficient is negative. These variables have a positive relation with advertising response that, like the negative effect of the number of branches, we should also discuss.

We assessed the effects of the urban population, the percentage of population from 15 through 30 years and the percentage of population from 30 through 45 years. Only, the population in age 15-30 has a negative effect on advertising response. The negative effect of the trend variable on QHD demand discussed in previous literature [7, 11] was observed. We included a time trend in the QHD model to present variables (such as tastes and preferences) which may be relevant but omitted from the equation.

We argue that the trend coefficient picks up the effect of these variables included in the equation. The negative sign on the time trend for QHD demand indicates the negative sign of other variables, which is not in model. However, the positive effect of the variables that are in model is greater than the negative effect of the variables that were not included.

We presented the results of this paper in three sections. Section 1 is allocated to the assessment of the impact of advertising elasticity on QHD deposit. In section 2, we considered the elasticity of effective variables on advertising response. Section 3 presents the elasticity of effective factors on QHD demand (direct and indirect).

Advertising Elasticity Estimation: To specify the time-varying model, long-run advertising elasticity for the QHD model is derived as:

$$t_{it} = \frac{\%\,\Delta(De_{it})}{\%\Delta(ADV_{it})} \tag{4}$$

Where τ_{it} is advertising elasticity. According to the empirical model (Equation (3)), which is logarithmic form, the coefficient of advertising variable is equal to advertising elasticity. The coefficient of advertising can be calculated as:

$$\begin{aligned} t_{it} = F(z_{it}) = \varphi_{it} = (d_0 + d_1(In_t) + d_2(R_{it}) \\ + d_3(NBR_{it}) + d_4(SH_t) + d_5(Ag15\text{-}30_t) \\ + d_6(Ag30\text{-}45_t) + d_7(GIF_{it})) + v_{it} \end{aligned} \tag{5}$$

According to Equation (5), advertising elasticity (τ_{it}) is a function of QHD gift value (GIF_{it}), Income per capita (In_t), number of bank branches (NBR_{it}), Interest rate of other deposit (R_{it}), urban population (SH_t), population in age 15-30 ($Ag15\text{-}30_t$) and population in age 30-45 ($Ag30\text{-}45_t$). If the quantity of these variables is put into Equation (5), we can calculate advertising elasticity over time for each bank. Results showed that advertising elasticity is variable, increasable and less than one for each bank (inelastic). Table 3 shows the maximum, minimum and mean of advertising elasticity for each bank. Meli Bank (MB) and Sanat va Madan Bank (SMB) have the highest (0.74) and lowest (0.18) advertising elasticity, respectively.

According to Table 3, the advertising elasticity of governmental banks during 2000-2004 shows that the average for MB, MLB, TB, SB, SPB, RB, KB, SMB, TSB and MSB is 0.51, 0.6, 0.58, 0.6, 0.43, 0.65, 0.62, 0.18, 0.57

Table 3: Advertising elasticity in governmental banks for 2000-2004

	Advertising elasticity							
Banks	2004	2003	2002	2001	2000	Maximum	Minimum	Mean
MB	0.71	0.71	0.39	0.40	0.36	0.36	0.71	0.51
MLB	0.82	0.80	0.46	0.47	0.43	0.43	0.82	0.60
TB	0.76	0.77	0.47	0.47	0.44	0.44	0.77	0.58
SPB	0.80	0.80	0.47	0.48	0.44	0.44	0.80	0.60
SB	0.62	0.63	0.30	0.32	0.28	0.28	0.63	0.43
RB	0.81	0.84	0.55	0.60	0.44	0.44	0.84	0.65
TSB	0.74	0.81	0.48	0.60	0.47	0.47	0.81	0.62
SMB	0.91	0.00	0.00	0.00	0.00	0.00	0.91	0.18
KB	0.84	0.82	0.41	0.41	0.34	0.34	0.84	0.57
MSB	0.95	0.97	0.63	0.60	0.53	0.53	0.97	0.74

Source: Own Results

and 0.74, respectively. It corroborates that, if we increase QHD advertising expenditure only 10%, attraction of QHD for these banks will be increased 5.1, 6, 5.8, 6, 4.3, 6.5, 6.2, 1.8, 5.7 and 7.4 percents, respectively. In economics, elasticity of one factor shows reaction with respect to other factors. This response is less than one for each bank.

According to variation of demographic prosperity and differences among advertising strategies in every bank, elasticity of advertising is different over time. We also reckoned the average of this elasticity in Table 3. To observe the advertising elasticity variation domain, we presented the maximum and minimum of its quantity. Meli Bank (MB) had more success in attracting QHD via advertising (its advertising elasticity is 0.74), while Tosse Saderat Bank (TSB), due to its new establishments, had the lowest advertising elasticity among Iranian governmental banks.

Average advertising elasticity growth in MB, MLB, TB, SB, SPB, RB, KB, SMB, TSB and MSB was 22.77, 20.4, 17.6, 29.72, 19.13, 99.85, 30.18, 16.98 and 17.48, respectively. Advertising elasticity of all of the governmental banks, other than Tosse Saderat Bank (TSB), has an increasing trend or is approximately constant.

Refah Bank (RB), with conferring micro-facilities to micro-firms, has advertising elasticity equal to 0.65. With this elasticity, RB attracted 6% of total Iranian governmental bank QHDs in 2004. Tosse Saderat Bank (TSB) with conferring exporting incentives, by advertising, Refah Bank (RB) attracted 12% of total Iranian governmental bank QHDs in 2004. Advertising elasticity of RB is equal to 0.62. About advertising elasticity of QHD in other governmental banks, SPB, MLB, TB, KB, MB, SB and SMB are in next ranking, respectively.

Advertising Response Elasticity: Allowing advertising response to vary over time is important, but knowing what factors contributed to that variation and by how much provides valuable information for crafting future strategies, changing the advertising focus, or altering preferred target audiences. In advertising response elasticity, we can derive the percentage change in long-run advertising elasticity with respect to changing the level of variable. We define this as:

$$\eta_{it} = \frac{\%?\ t_{it}}{\%?\ z_{it}} \qquad (6)$$

where, η_{it} is advertising response elasticity. z_{it} and τ_{it} are effective variable vectors on advertising elasticity and its advertising elasticity, respectively. According to the QHD logarithmic model and the linear form of advertising elasticity, we can compute what we define as advertising marginal effect:

$$\eta_{it} = \frac{\partial t_{it}}{\partial z_{it}} \times \frac{z_{it}}{t_{it}} = d_i \times \frac{z_{it}}{t_{it}} \qquad (7)$$

where, η_{it} is the marginal effect of i_{th} variable, δ_i is coefficient of i_{th} variable, z_{it} and τ_{it} are vector effective variables on advertising elasticity and advertising elasticity, respectively. z_{it} consists of QHD gift value (GIF_{it}), Income per capita (In_t), number of bank branches (NBR_{it}), Interest rate of other deposit(R), urban population (SH_t), population in age 15-30 ($Ag15\text{-}30_t$) and population in age 30-45($Ag30\text{-}45_t$).

Table 4: Average of the marginal effect of advertising

Banks	Interest rate of other deposit	Income per capita	Numbers of branches	Urban population	Population in age 15-30	Population in age 30-45	Gift
MB	1.27	1.54	-0.48	0.29	-8.81	1.13	0.01239
MLB	1.07	0.99	-0.19	0.20	-6.10	7.02	0.00455
TB	1.07	1.33	-0.27	0.27	-7.87	9.06	0.00590
SP	1.03	0.97	-0.16	0.17	-4.91	9.65	0.00262
SB	1.38	1.90	-0.61	0.28	-8.12	9.35	0.00867
RB	0.94	0.91	-0.09	0.18	-5.23	6.02	0.00434
TSB	0.82	1.24	0.00	0.15	-4.51	5.19	0.00048
SMB	0.84	0.52	0.00	0.10	-3.00	3.45	0.00001
KB	1.08	1.47	-0.20	0.15	-4.41	5.09	0.00692
MSB	0.91	1.05	-0.08	0.13	-3.84	4.43	0.02743

Source: Own Results

Table 4 exhibits the average of advertising elasticity response for each bank. Accordingly, for example with Meli Bank (MB), advertising response elasticity with respect to gift value equals to 0.02, which means that if value of MB gifts increase by only 10%, the elasticity of advertising response will increase 0.2%. This generalizes to each bank and other variables. In Table 4, we observed the negative effect of the number of branches variable and the positive effect of Interest rate of other deposit variable. Variable economic theory and literature have no prediction; thereby, these variables can be alternate in signs.

Elasticity of Effective Variables on QHD Demand (Except Advertising Factor): Given the non-linear specification of the time-varying parameter model (Equation (3)), we have two variable categories. Factors that affect on QHD demand indirectly will be affected on QHD demand as advertising elasticity. They consist of QHD gift value (GIF_{it}), urban population (SH_t), population in age 15-30 ($Ag15\text{-}30_t$) and population in age 30-45 ($Ag30\text{-}45_t$). Elasticity of QHD demand with respect to these variables is calculated as:

$$T_{it} = \frac{\%\Delta(De_{it})}{\%\Delta(X_{it})} = d_i Ln(ADV_{it})X_{it} \quad (8)$$

Where T_{it} is elasticity of QHD demand with respect to X_{it}, δ_i is coefficient of i_{th} indirect variable and ADV_{it} and X_{it} are advertising and quantity of variable i_{th}, respectively. X_{it} consists of QHD gift value (GIF_{it}), urban population (SH_t), population in age 15-30 ($Ag15\text{-}30_t$) and population in age 30-45($Ag30\text{-}45_t$).

The second category is variables that affect QHD demand directly and indirectly. These variables consist of (GIF_{it}), Income per capita (In_t), number of bank branches (NBR_{it}) and the Interest rate of other deposit (R_{it}). Elasticity of QHD demand with respect to these variables is calculated as:

$$E_{it} = \frac{\%\Delta \text{ Ln}(De_{it})}{\%\Delta \text{ Ln}(X_{it})} = a_i + d_i Ln(ADV_{it})X_{it} \quad (9)$$

where, E_{it} is elasticity of QHD demand with respect to X_{it}, δ_i is coefficient of i_{th} direct variable, i_{th} is coefficient of i_{th} indirect variable and ADV_{it} and X_{it} are advertising and quantity of variable i_{th}, respectively. X_{it} consists of Income per capita (In_t), number of bank branches (NBR_{it}) and Interest rate of other deposit (R_{it}). Table 5 exhibits the average of elasticity present in Equations (8) and (9).

According to Table 5, elasticity of QHD demand with respect to QHD gift value (GIF_{it}), urban population (SH_t), number of bank branches (NBR_{it}), Income per capita (In_t) and population in age 30-45($Ag30\text{-}45_t$) are positive in signs. This means that, if these variables increase, QHD will increase. For example, with a 10% increase in MB gifts, QHD demand in Meli Bank (MB) will increase by 0.2%. Maskan Bank (MSB) had the highest elasticity QHD demand with respect to gifts (0.13). Similarily, a 1% increase in urban population can increase a 0.6% QHD demand in MB. We generalize this to population in age 30-45 as well.

Elasticity of QHD demand with respect to the number of bank branches (NBR_{it}) is positive. This corroborates that increasing the number of branches can increase QHD attraction. For example, a 10% increase in MB branches

Table 5: Average of elasticity of effective variable on QHD

Banks	Interest rate of other deposit	Income per capita	Numbers of branches	Urban population	Population in age 15-30	Population in age 30-45	Gift
MB	-3.93	8.67	-0.42	0.60	-17.63	20.29	0.02993
MLB	-3.69	6.28	0.16	0.37	-10.85	12.49	0.01669
TB	-4.27	8.28	0.07	0.54	-15.88	18.28	0.01523
SP	-3.65	6.34	0.21	0.39	-11.57	13.32	0.00656
SB	-4.48	8.45	-0.39	0.57	-16.56	19.06	0.01817
RB	-3.41	6.71	0.17	0.45	-13.19	15.18	0.01311
TSB	-6.01	6.40	0.69	0.24	-6.92	7.97	0.00441
SMB	-12.63	-2.75	0.63	-1.06	31.28	-35.99	0.00002
KB	-4.14	8.71	0.08	0.61	-17.67	20.35	0.02493
MSB	-2.82	9.73	0.39	0.76	-22.23	25.59	0.13388

Source: Own Results

can increase a 3.4% attraction of QHD. However, this is negative for Meli Bank (MB) and Saderat Bank (SB). Assessment of these two bank branches shows that they have only 40% of total governmental bank branches. Over saturation of branches of these banks (MB and SB) can be the cause.

Interest rate of other deposit (R_{it}) and population in age 15-30($Ag15\text{-}30_t$) have a negative effect on QHD demand. For example, if the Interest rate of other deposit increases by 1%, QHD attraction will decrease by 3.93% in Maskan Bank (MSB). This matter can be considered about other banks and in a similar way, we can assess and evaluate population in age 15-30 ($Ag15\text{-}30_t$).

DISCUSSION, RECOMMENDATIONS AND CONCLUSION

Evaluation results of governmental banks advertising elasticity shows that QHD demand advertising elasticity has displayed an increasing trend during 2000-2004, although their averages differ among banks. For example, average advertising elasticity during 2000-2004 for Meli Bank (MB) is 0.51, which indicates that, if advertising expenditure increases by 10%, QHD attraction will increase by 5.1%. This means that the advertising factor has caused QHD demand function to shift; therefore, advertising can affect QHD attraction.

Comparison of advertising elasticity among governmental banks shows that during 2000-2004, Maskan Bank (MSB) had the highest advertising elasticity (0.74). This means that if advertising expenditure of MB increase only by 10%, attraction of QHD will increase 7.4%. This matter can be considered for all banks, except Sanat va Madan Bank (SMB), which is a newly established bank and we can not assure the trend of its elasticity.

Assessment of the increasing trend of advertising elasticity indicates that, during 2002-2003, bank advertising (except SMB) had a progressive trend. But during 2000-2002, we observed a constant or increasing trend. Evaluation of the progressive increase in advertising elasticity during 2002-2003 indicates that Kesharvarzi Bank (KB) has had the highest growth in advertising elasticity. Comparing the advertising elasticity growth trend during 2000-2004 shows that Refah Bank (RB), with 99.85% growth and Tosse Saderat Bank (TSB), with 16.98% growth in advertising, had the highest and lowest advertising growth, respectively.

Comparisons of advertising elasticity in banks have consistency with the percentage of deposit attraction. Advertising elasticity of MB in 2004 is 0.95 (the highest advertising elasticity in governmental banks). Thereby, Meli Bank was able to attract 23% of total QHD, the highest attraction of QHD in governmental banks. Meli Bank (MB) appears to have had the best yield and performance among the other governmental banks in QHD attraction via advertising.

Assessment of advertising response elasticity for all governmental banks (except SMB), indicates that gift value (GIF_{it}), Income per capita, numbers of branches (NBR_{it}), urban population (SH_t) and population in age 30-45($Ag30\text{-}45_t$) have a positive effect on it. This means that if the value of the gift increases, advertising elasticity will increase. Typically, if MB gift value increases only by 10%, advertising elasticity will increase by 1.2% and thereby, QHD attraction will increase by 0.2%. Similarily, if Income per capita increases by 1%, advertising, elasticity will increase by 1.5% and thereby, QHD

attraction will increase 8.67%. This can be considered for urban population (SH_t) and population in age 30-45 ($Ag30\text{-}45_t$). The effect of population in age 15-30 ($Ag15\text{-}30_t$) is negative. If that percentage increases, attraction of QHD will decrease, which means that personal preferences in ages 15 through 30 years ($Ag15\text{-}30_t$) is negative. This is consistent with ages 15 through 30 years ($Ag15\text{-}30_t$) and the higher moral incentive and other incentives in personal I age from 30 through 45 years ($Ag30\text{-}45_t$).

Effects of the Interest rate of other deposit (R_{it}) and the number of bank branches (NBR_{it}) on QHD advertising elasticity are negative and positive, respectively. However, if we consider these variables in the model as direct and indirect, these two variables have a positive and negative effect on QHD, respectively.

Another result of this study concerns the factors that affect QHD demand, apart from advertising. According to Table 5, elasticity of QHD demand with respect to QHD gift value (GIF_{it}), urban population (SH_t), number of bank branches (NBR_{it}), Income per capita (In_t) and population in age 30-45($Ag30\text{-}45_t$) are positive in signs. This means that, if these variables increase, QHD will increase. For example, with a 10% increase in MB gifts, the QHD demand in Meli Bank will increase by 0.2%. Maskan Bank (MSB) had the highest elasticity of QHD demand with respect to gifts (0.13). Similarily, a 1% increase in the urban population can increase the QHD demand by 0.6% in MB. We can generalize this matter to the percentage of population from 30 through 45 years.

Elasticity of QHD demand with respect to the number of bank branches (NBR_{it}) is positive, which corroborates that increasing the number of branches can increase QHD attraction. For example, a 10% increase in MB branches can increase attraction of QHD by 3.4%. This is negative for Meli Bank (MB) and Saderat Bank (SB). Assessment of these bank branches shows that they have 40% of total governmental bank branches, so branch over saturation for MB and SB can be the reason.

Interest rate of other deposit (R_{it}) and population in age 15-30 ($Ag15\text{-}30_t$) had a negative effect on QHD demand. For example, if the Interest rate of other deposit increases by 1%, QHD attraction will decrease by 3.93% in Maskan Bank (MSB). This can be considered about other banks and in a similar way, we can assess and evaluate population in age 15-30 ($Ag15\text{-}30_t$).

According to the positive effect of advertising on QHD attraction, we suggest all banks, especially Meli Bank, increase their investment on advertising. Furthermore, assessment of gifts shows that they have a positive effect on QHD attraction. Thereby, we suggest that banks develop their gifts.

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