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Marriage crisis and housing costs: Empirical evidence from provinces of Iran

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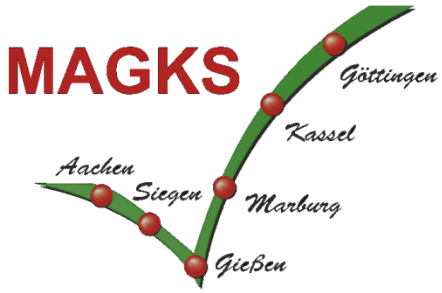

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Marriage Crisis and Housing Costs: Empirical Evidence from Provinces of Iran

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Abstract

The term "marriage crisis" is becoming more visible in Iranian public and private debates and constitutes a major issue in political discussions at the time of elections. The increasing working age and young population in Iran have difficult times to establish family. This has increased the political concerns of addressing the basic needs of young Iranians. This study examines the link between housing costs and marriage rate in Iran controlling for other relevant economic determinants of marriage. Using a panel of provinces of Iran over a period of nine years (2003-2011) and applying generalized method of moments (GMM) estimator, our results reveal that there is a negative relationship between housing costs and marriage rate. We also find that government special loan for marriage, and lower level of unemployment rate increase marriage rate. Finally, increasing spending on higher education has a dampening effect on marriage rate.

Keywords: marriage, housing, real estate, Iran, GMM

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1. Introduction

During the last decade, one of the major socio-demographic trends taking place in Iran has been a delay at marrying age and a decrease in marriage rate. According to *Iran's National Organization for Civil Registration*, 48% of women and 46% of men are at the marrying age but they have not married yet (BBC, 2013a). Similarly, another survey study conducted by Abhari (2013) showed that 84% of young Iranians[1] at the marrying age cannot afford to marry. Table 1 shows the changes of marring age of men and women in Iran. As it can be seen, over the last three decades, the mean age at first marriage has risen from 23.8 to 26.7 for men and from 19.9 to 23.4 for women.

Table 1. Mean age at first marriage in Iran, 1986-2011

Year	Men	Women
1986	23.8	19.9
1996	25.6	22.4
2006	26.2	23.3
2011	26.7	23.4

Source: Statistical Center of Iran, available at http://www.amar.org.ir/Default.aspx?tabid=103

The literature suggests that the high housing prices and rents are among the main factors deterring many young Iranians from marriage and family formation (e.g., BBC, 2013a; Abhari, 2013; Entekhab, 2013; Moaveni, 2009; Gholipour, 2012; Moghadasjafari & Yaghobi, 2007). Homeownership or at least having a rented house before marriage has traditionally been important in Iran. Given the persistent increases in housing prices and rents many young Iranians cannot afford to provide housing to form a household. Over the

[1] Iran is a very young country, with 55 percent of the population under 30 in 2011.

last decade, housing prices and rents have soared across the country[2]. Figures 1 and 2 show the housing prices and rents per square meter in selected major cities in Iran, respectively.

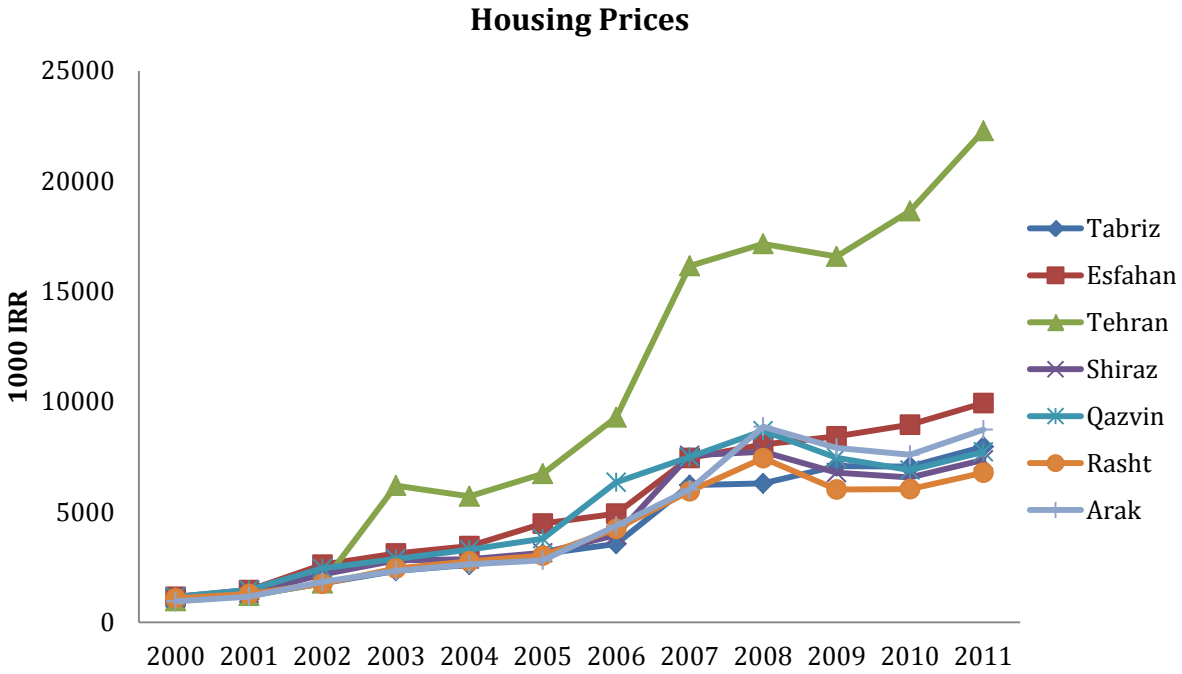

Figure 1. Trend in Housing Prices per Square Meter in Selected Major Cities of Iran (1000 IRR), 2000-2011; Source: Statistical Center of Iran, http://www.amar.org.ir/Default.aspx?tabid=96&agentType=ViewType&PropertyTypeID=46&currentpage=2

[2] Economists and observers have mentioned several factors that pushed housing prices and rents up in Iran in last decade such as: excess demand in housing market (particularly investment demands); speculation of real estate agents; high level of inflation; injection of petro-dollar to the economy; increases in costs of construction due to reduction of subsidiaries from goods and services during Ahmadinejad presidency as well as sanctions imposed on the economy of Iran by the United Nations (UN), the United States (U.S.) and European Union; increases in land prices; and currency crisis (E.G., BBC, 2013b; Gholipour, 2012; Hadavandi, Ghanbari, Mirjani & Abbasian., 2011; Abbasinezhad &Yari, 2009; Rahimi, 2012).

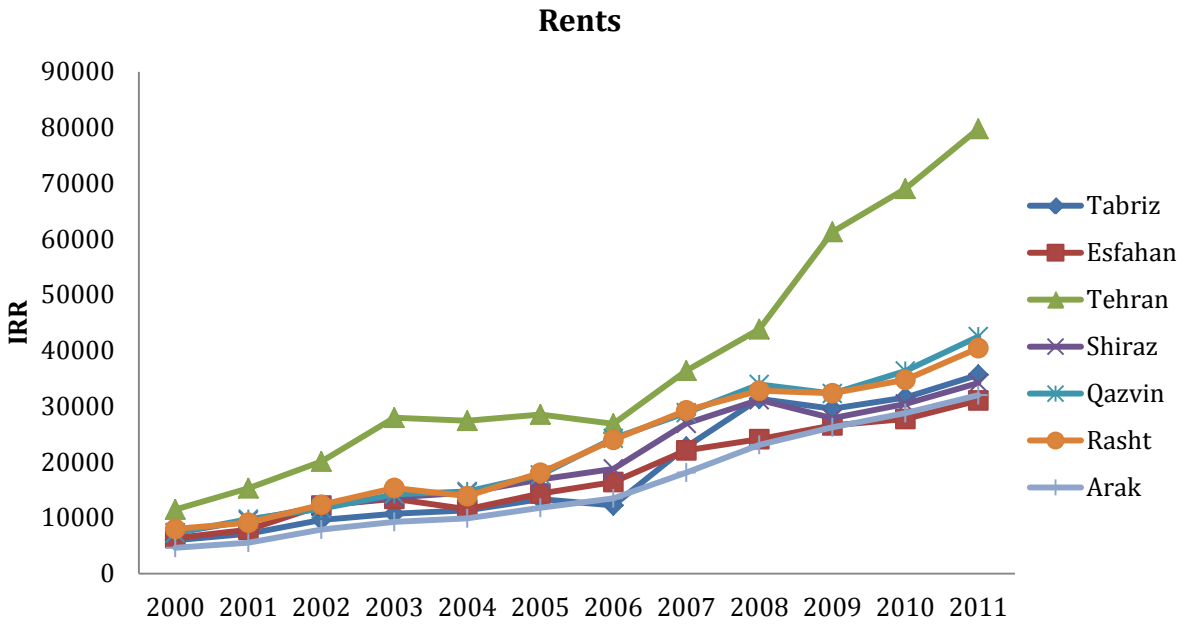

Figure 2. Trend in Rents per Square Meter in Selected Major Cities of Iran (IRR), 2000-2011; Source: Statistical Center of Iran, http://www.amar.org.ir/Default.aspx?tabid=96&agentType=ViewType&PropertyTypeID=46&currentpage=2

An example of capital city of Iran, Tehran, shows the degree of housing crisis for the young population. According to Statistical Center of Iran, the average annual income for an urban household was IRR 130,301,445 in 2011. At the same time the average annual rental costs for a house with 75 square meters was IRR 71,786,700 in Tehran. It means that 55% of households' income is allocated to rental costs in Tehran. Similarly, the average housing prices with 75 square meters was IRR 1,671,075,000 in Tehran in 2011. It means household income for a year in Tehran is just 7.79% of price of a house with 75 square meters. In fact, for Iranian households, expenditures on housing represent around 30 percent of total household expenditures in urban areas (e.g. Gholipour, 2012; Abbasinezhad & Yari, 2009). The ratio is around 40 percent and more for low income groups in big cities, according to the Unit of Housing Economics and Planning (2010), *Ministry of Roads and Urban Development*. Due to low depth of housing finance (2.8 percent

of GDP)[3] purchasing an average house in Tehran is a challenging task for an average household. The same increasing trend in house prices and rents can be observed in other urban and rural areas but with lower severity than in Tehran. In fact, Iranian households, particularly middle and low-income groups, spend the large portion of their income on housing (Gholipour, 2012).

The significant demographic transition (e.g., increasing young and working age population) in Iran has increase the economic and political burden. In 2010, the largest share of population of Iran was in the age group of 20-24 years old (12% of total population). Almost 23% of total population of Iran in 2010 was in the age of 20-30 years old (World Population Prospects, 2012).

It is shown that in the case of good policies in meeting the basic economic and political needs of young population, such demographic transition can change to a bonus for the national economy. If the political institutions and economic structure fail to meet such needs including affordable housing, then the demographic transition may convert to a demographic curse, destabilizing political system as reflected in the Arab Uprisings since 2011 and the Green Movement in Iran in 2009 (see Bjorvatn and Farzanegan (2013) for more details).

In this paper we examine the relationship between housing prices, rents and marriage rate using data from provinces of Iran. We look for evidence of a link between high and persistent housing prices and rents and the significant marriage decline experienced by Iran in last decade.

[3] See Warnock and Warnock (2008).

The contributions of this paper to the literature on macro determinants of marriage are two-fold. First, while there have been a number of conceptual and descriptive works such as Vahidnia (2007), Mirzaie (2005), Aghajanian and Thompson (2013), Abbasi-Shavazi and McDonald (2006), Mahdavi (2007), Moghadasjafari and Yaghobi (2007) and Kazemipour (2004), who have examined marriage, fertility and divorce trends for Iranian society, very few empirical studies have investigated the relationship between housing costs and marriage in Iran. Even such analyses for other Middle East and North African countries due to lack of reliable housing costs and marriage data are rare. To our knowledge, most studies in this area cover the U.S., European and East Asian countries. Second, there has been many cross-country and time-series studies on the economic determinants of marriage and household formation such as Borsch-Supan (1986), Ahn and Mira (2001), Clark (2012), Ermisch and Di Salvo (1997), Ermisch (1999), Haurin, Hendershott and Kim (1993), Hughes (2003) and Mulder and Billari (2010). However, no empirical works have examined the economic determinants of marriage or household formation by using panel data from a sample of provinces of a country in the Middle East. Thus, our paper adds to our understanding of housing market-family formation in Iran as a developing country which is experiencing a significant demographic transition by applying province level data. In the panel setting we can also control for other important time-invariant factors which shape family formation behavior besides economic drivers such as regional norms, tradition and attitudes toward marriage.

The paper proceeds as follows: Section 2 provides a brief background on the importance of marriage and family formation in Iran as an Islamic country. Section 3 presents a theoretical explanation for the relationship between housing costs and marriage

and also reviews some of the relevant studies. Section 4 describes data and empirical methodology. Section 5 presents the empirical results and Section 6 concludes this paper.

2. Background Information

Understanding the factors contributing to the delay marriage in Iran is getting an important issue at national level due to following reasons: First, Iran, as a Muslim dominant country[4], used to be a society in which people married young. In a Muslim society that views male-female relationships before marriage and premarital sex as taboo, decreases in marriage rate have worried Iran's religious government which promotes the virtue of chastity and views young people's shifting attitudes toward sexuality as a direct threat to the Islamic Revolution's core values[5] (Moaveni, 2009). Generally, the institution of marriage has been given tremendous importance and it is highly recommended in Islam, particularly in *Shia* branch of Islam. There are around 40 saying (*Hadith*) of Prophet Muhammad and his companions (*Shia Imams*) about the impacts and advantages of marriage on human life and society. Second, historically, families have been primary units for organizing nearly all of the social activities of life, including production, consumption, education, socialization, reproduction, leisure, and living arrangements in Iran. Establishing, maintaining, and continuing family units have been encouraged through a strong idealized family morality integrated with pre-Islamic religion (Zoroaster) and Islamic values (Aghajanian & Thompson, 2013). Third, the marriage has been getting a hot topic in almost all political election debates and campaigns. For example, in 2013 Iranian presidential election, the candidates' highest priorities were to increase youth's

[4] The results of 2011 national census showed that 99.4% of Iranians are Muslim.
[5] *Shia* Muslims are in the majority in Iran.

employment and marriage (Mehrnews, 2013). This social issue has also been utilized as an efficient instrument to critic past government officials. Fourth, it is argued that fertility decline and low population growth rate in Iran is largely a product of changes in marriage patterns as well as increases in contraceptive use (e.g. Vahidnia, 2007). According to *Statistical Center of Iran*, the annual average growth rate of population from 1996 to 2006 was 1.62% while the rate declined to 1.29% for the period of 2006-2011. Given above arguments, analyzing the determinants of marriage in Iran will provide valuable insights for policymakers in order to have better strategies to increase marriage rate in Iran.

3. Review of Theoretical and Empirical Literature

We use the Easterlin hypothesis (Easterlin, 1980) and the explanation provided by Hughes (2004) as a conceptual foundation of this study. The Easterlin hypothesis attempts to explain the baby boom that followed *World War II* and the decline in the U.S. fertility that began in 1967. The basic concept of this hypothesis is that favorable (unfavorable) labor market conditions for young workers looking for entry-level employment and consequently higher (lower) income of young adults relative to their parents can cause higher (lower) level of fertility rate (Jeon & Shields, 2005). In other words, this hypothesis argues that young people assess their economic well-being relative to the standard of living they enjoyed in their parents' households when they are considering childbearing and marriage. For example, when economic conditions are good, young people reach their parents' standard of living more easily and form families earlier (Hughes, 2004). Similar to the Easterlin hypothesis, Hughes (2004) argues that young adults measure their income and their economic readiness (including home ownership) for marriage against their

material aspirations. If young adults are able to achieve home ownership (which is an important marker of economic security and future economic well-being) and income is high relative to aspirations, then it will be easier to marry sooner and have more children.

Given the sharp increases in housing prices and rents in Iran and since most young Iranians live with their parents until marriage, therefore, based on Easterlin hypothesis and Hughes (2004) argument, we can expect that expensive housing market can encourage young Iranians to delay their marriage. Our expectation is also consistent with findings of Hughes (2003) who shows that marriage which is perceived as an expensive living arrangement should be less common in unfavorable housing and labor markets.

A large number of studies have tested the relationship between home ownership, housing costs and marriage and household formation. Majority of these studies have shown that young people may postpone marriage/household formation and parenthood if they cannot get access to homeownerships or housing costs are too high (e.g., Borsch-Supan, 1986; Haurin et al., 1993; Hughes, 2003; Hughes, 2004; Clark, 2012; Mulder &Billari, 2010; Hui et al., 2012; Morgan & Taylor, 2006). For instance, based on a sample of the U.S. youths in their twenties, Haurin et al. (1993) showed that real housing rents and earning capacity are important determinants of the decisions to leave the parents' home, to marry, and to live with a group or separately. The same results are found by Di and Liu (2006) for the U.S. Using Annual Housing Survey 1976-1977 from the U.S. Metropolitan Areas, Borsch-Supan (1986) find strong responsiveness of household formation to housing prices and income. Moreover, his results suggest that housing allowances has the strong impact on household formation. Clark (2012), using American Community Survey for 2006-2008, show that women delay family formation and fertility in expensive housing markets. Based on the U.S.

census 1990 Public Use Microdata Samples, Hughes (2003) documents that individuals (aged18-35) are more likely to be married than to live in any of the alternative arrangements (living alone, living with a partner, living with roommates, living with parents) when potential earnings are high and housing costs are low. In a subsequent study, Hughes (2004) finds that higher costs of owner-occupied housing decrease marriage. In addition, she finds that the effects of housing values on marriage are similar for blacks and whites and more pronounced among young adults without a college degree. Kent (1992) finds that income, the housing costs, government aid to families with dependent children, age at first marriage and male education level affected on young household formation in the U.S. during 1961-987.

Ermischand Di Salvo (1997) show that higher housing prices discourage the formation of partnerships for young women and men in Britain. Moreover, their finding suggest that young people's permanent income has a significant effect on men's departures from the parental home to live alone or with friends/others, and also on women's exit to live with a partner or friends/others. The same results were found by Ermisch (1999) who provide evidences that tighter housing markets decrease the formation of partnerships while young people with larger current income are more likely to leave the parental home in Britain. Other studies for Britain have also suggested that couples defer marriage because they do not afford to buy a house (e.g., Ineichen, 1981).

Hui et al. (2012), using aggregate annual time series data spanning the period 1976 to 2010 for Hong Kong, find that increases in housing prices and elderly dependency ratio leads to decrease in birth rate and conclude that housing market restrictions lead to the postponement of couple formation and fertility. Similarly, using a cross-sectional data from

18 Western countries, Mulder and Billariin (2010) show that family formation and fertility are hampered in countries with difficult access to homeownership and low access to mortgages. Lauster (2006), using the Swedish Family Survey, also finds that greater access to housing increases the likelihood of family household formation. Martínez-Granado and Ruiz-Castillo (2002) emphasize the role of housing costs and income as the basic determinants of the household formation and related demographic decisions in Spain. Focusing on economy of Portugal, Martins and Villanueva (2009) find that higher costs of home mortgage significantly decrease household formation.

4. Data and Empirical Methodology

4.1 *Data*

The objective of this paper is to examine the relationship between housing prices, rents and marriage rate in a panel data setting. Iran is administratively divided into 31 provinces (*Ostans*) in 2012. We used annual data for 30 provinces of Iran from 2003 to 2011 because Alborz province was formed in 2010 and the data for this province is not available. Moreover, the choice of the data period for the empirical analysis is based on the availability of data series.

The data for number of registered marriage in each province was obtained from *Iran's National Organization for Civil Registration*. Then we calculated the marriage rate per 1000 population for each province. The highest annual average of marriage rate is for Khorasan Shomali[6] (13.86), Ardabil (13.50) and Zanjan (13.01) whereas Tehran (8.83) and Semnan (9.45) scored the lowest marriage rate.

[6] Data for Khorasan Shomali and Khorasan Jonobi are only available from 2005 to 2011.

Information on average housing prices per square meter (1000 IRR) and average rents (including 3% of deposits agreed in contracts concluded between landlord and lease-holder) per square meter (IRR) was taken from the *Statistical Center of Iran*. It should be noted that information on housing prices and rents are gathered from capital city of each province. The data shows that industrialized provinces such as Tehran, Isfahan, and Qazvin are ranked as the most expensive housing markets over the period of the present study.

In considering the relationship between housing prices, rents and marriage, it is important to control for other relevant factors. This ensures that housing costs will be evaluated with clearly less concern about omitted variables. Thus, following existing studies on marriage and household formation and also based on current arguments by Iranian sociologists and economists, we selected unemployment rate, education, living costs and government special loan for marriage as control variables in the model specification. Table 2 reports descriptive statistics of variables.

Table 2. Descriptive statistics

	MG	UE	ED	IF	HP	HR
Mean	11.64	11.49	252,783.70	15.51	4,630.69	17,665.56
Max	22.68	21.10	6,854,432.00	27.60	18,647.00	69,026.00
Min	5.69	4.10	11,065.93	7.50	1,047.00	1,322.00
Std. Dev.	1.84	3.13	695,019.80	4.31	2,789.41	9,090.54

Note: MG is the marriage rate; UE is unemployment rate; ED is total expenditures in higher education in public and private education institutions (in millions of IRR); IF is inflation rate, HP is housing price per square meter (in 1000 IRR); HR is housing rent per square meter (in IRR). The results are based on a sample of 30 provinces over the period of 2003-2011.

Unemployment generally delays couple formation and people's household formation because high unemployment rates suggest a weak labor market and decrease economic opportunities for potential mates that can reduce the earnings potential and

desirability of partners for marriage. In other words, since marriage and childbearing involve long-term commitments therefore high unemployment can bring enormous uncertainty regarding future careers and income as well as lower current income for many individuals and households which in turn can inhibit marriage (e.g., Ahn& Mira 2001; Ermisch & Di Salvo, 1997; Ekert-Jaffe & Solaz, 2001). Thus, it is to be expected that unemployment rate is negatively associated with marriage in Iran (e.g., Abbasi-Shavazi & McDonald, 2006; Abhari, 2013; Kazemipour, 2004; Moghadasjafari & Yaghobi, 2007). The annual unemployment rate of provinces was taken from the *Statistical Center of Iran*.

In prior studies in Iran, researchers document a delaying effect of education (particularly women's education) on marriage and fertility (e.g., Vahidnia, 2007; Abbasi-Shavazi & McDonald, 2006; Moaveni, 2009; Kazemipour, 2004). In recent years, an increasing number of young Iranians delay marriage and child-rearing and engage in higher education into their 20s can encourage a slower rate of new household formation. Furthermore, the wide expansion of education in Iran has significantly contributed to the modernization of young Iranians and their life style which likely to have an indirect effect on postponement of marriage. On the other hand, it is argued that education has a positive impact on the probability of forming a household because the more educated individuals (particularly men) are also those with higher earning capacity and, most probably, they enter the marriage market sooner (Martínez-Granado & Ruiz-Castillo, 2002). Results of existing studies in other countries also support the view that education is an important determinant of the marriage and household formation (e.g., Ekert-Jaffe & Solaz, 2001; Hughes, 2003). In this study, we used total expenditures in higher education in public and

private education institutions in each province as proxy for education. The data on education expenditures (in millions of IRR) are from the *Statistical Center of Iran*.

Furthermore, several observers argue that the high living costs (e.g., expensive wedding ceremony, home appliances, and increasing cost of rearing children) have been a major factor in the postponement of marriage (e.g., Abbasi-Shavazi & McDonald, 2006;Entekhab, 2013; Moghadasjafari & Yaghobi, 2007; Ilias, 2010). We used inflation rate a proxy for living costs. It is expected that higher level of inflation reduce the marriage rate. Finally, we included a binary variable in the model to control for the impact of government special marriage loan on marriage rate. Since 2006, the government has provided loan with low interest rates to young Iranians in order to increase marriage and birth rates.

4.2 *Model*

Based on the above discussion, the empirical model we used is as follows:

$$\mathrm{MG}_{it} = cons + \beta_1 \cdot \mathrm{UE}_{it} + \beta_2 \cdot \ln\mathrm{EDU}_{it} + \beta_3 \cdot \mathrm{IF}_{it} + \beta_4 \cdot \ln\mathrm{HC}_{it} + \beta_5 \cdot \mathrm{D}_{MGLOAN} + \alpha \cdot \mathrm{MG}_{it-1} + v_i + \Omega_t + u_{it} \quad (1)$$

Equation (1) is a dynamic panel model which allows for dynamic effects ($\mathrm{MG}_{\mathrm{it\text{-}1}}$), individual fixed province effects (v), fixed time effects (Ω), error term (u), and where i = 1,..., N denotes the province, t = 1,..., T denotes the time period, ln is the natural logarithm, MG is the marriage rate, UE is unemployment rate, ED is total expenditures in higher education in public and private education institutions, IF is inflation rate, HC is housing costs including housing prices (HP) and rents (HR), $\mathrm{D}_{\mathrm{MGLOAN}}$ is dummy for the marriage loan (1 if 2006-2011, 0 elsewhere). We did not take the natural logarithm of the MG, UE and IF. This is because the MG is number of marriage as a percentage of population and UE and IF are as a rate.

4.3 *Methodology*

We applied the dynamic panel generalized method of moments (GMM) to estimate the relationships between the explanatory variables and marriage rate. The main justification for using this approach comes from the fact that there is endogeneity problem[7] in the model. For example, we assumed that housing costs make the marriage more expensive, and that as a result, young people are less willing to form household. On the other hand, household formation is an important factor in determining aggregate housing demand and prices (Borsch-Supan, 1986; Ermisch, 1996; Mulder, 2006; Kent, 1992). This form of endogeneity of explanatory variables is simultaneity. This arises when one or more of the explanatory variables are jointly determined with the dependent variable (Wooldridge, 2009). Furthermore, the macro datasets that we use in this study typically lack controls for couple demographic characteristics and may suffer from omitted variables. Economically, there is an endogeneity problem if there are factors unobservable to the researcher that affect both dependent variable and the explanatory variables. When there is endogeneity problem both OLS and fixed-effects estimates will be biased.

The problem can be solved by applying instrumental variable[8] methods such as GMM (Wooldridge, 2009). The GMM panel estimator provides consistent and unbiased estimates under the assumption that unobserved heterogeneity exists but is fixed or time-invariant (Wintoki, Linck & Netter, 2012). The GMM estimator was introduced by Arellano

[7]Endogeneity problem arises in cases where explanatory variables are correlated with the error term. There are three situations where some of the explanatory variables are correlated with error term: omitted variables, measurement error and simultaneity/reverse causation (Wooldridge, 2009).

[8] The idea behind instrumental variables is to find a set of variables, termed instruments that are both (1) correlated with the explanatory variables in the equation, and (2) uncorrelated with the disturbances. These instruments are used to eliminate the correlation between right-hand side variables and the disturbances (EViews, 2009).

and Bond (1991). In the present study, we used the difference GMM estimator. In the difference GMM, individual specific unobserved (fixed) effects are eliminated by using a first differencing transformation.

After first-differencing, the equation is estimated via GMM. We applied lagged values of the explanatory and dependent variables as instruments for the current explanatory variables. That is, we use historical values of unemployment rate, education expenditures, inflation rate, housing costs and marriage rate as instruments for current changes in explanatory variables.

For models estimated by GMM, it is important to calculate the second order (AR (2)) serial correlation statistic proposed by Arellano and Bond (1991). AR (2) is a test for serial correlation in the first-differenced residuals, under the null of no serial correlation. The *p*-value of AR (2) statistic should be insignificant (Arellano & Bond, 1991). Finally, we test the validity of the instruments used in the GMM estimations by applying the Sargan test. The Sargan test is a test for over-identifying restrictions (a chi-square test to determine if the residuals are correlated with the instrument variables). The validity of the instrument variables should not be rejected by Sargan test (Arellano & Bond, 1991).

5. Results

This section presents and discusses the results of our analyses. Columns 1 and 2 of Table 3 present the results of GMM estimator for the full sample of provinces. To avoid multi-collinearity, the HP and HR are added one by one to the model. This is because there is very high correlation between two variables. In column 1, we include HP and control variables. In column 2, we include HR and control variables. The results show that changes in the

level of HP and HR have negative and significant relationships with changes in the marriage rate in the full sample of provinces. This means that expensive housing market can encourage young Iranians to delay their marriage. Our finding confirms that the marriage behavior of Iranians can be explained, to some extent, by the Easterlin hypothesis and the explanation provided by Hughes (2004). Moreover, this result from panel data analyses is in line with previous cross-sectional studies such as Kent (1992), Ermisch and Di Salvo (1997) and Hughes (2003, 2004) who found that housing costs is an important determinant of marriage and household formation. The results also indicate that the elasticity of HR (-2.805, $p < 0.01$) is much larger than the elasticity of HP (-1.973, $p < 0.05$) meaning that marriage rate in Iran is more sensitive to rents than housing prices. This is due to the fact that persistent increases in housing prices reduce affordability of young couples to own houses and as a result increase demands for rented houses by them to start the union. According to 1390 census, conducted by *Statistical Center of Iran*, households with rented houses increased from 22.9% in 2006 to 26.6% in 2011 while house ownership by households decreased from 63.4% in 2006 to 56.4% in 2011.

Table 3. Results of GMM Panel Estimation Regressions

Dependent variable: MG				
	Full Sample		Sample without Tehran	
	(1)	(2)	(3)	(4)
UE	-0.279***	-0.105*	-0.170***	-0.099*
	(-6.645)	(-1.728)	(-3.611)	(-1.668)
lnED	-1.774***	-1.451***	-0.958	-0.190
	(-2.955)	(-2.820)	(-0.635)	(-0.182)
IF	0.1085**	0.089	0.051	0.155
	(2.472)	(1.521)	(0.913)	(1.422)
lnHP	-1.973**	---	-2.321***	---
	(-2.076)		(-3.966)	
lnHR		-2.805***		-4.091*
	---	(-4.217)	---	(-1.834)
D_{MGLOAN}	2.108*	1.711**	4.360***	2.160
	(1.793)	(2.144)	(3.435)	(1.333)
$MG_{(t-1)}$	1.567***	1.327***	0.957***	1.478***
	(8.997)	(4.278)	(5.897)	(2.415)
AR (2) test (*p*-value)	(0.535)	(0.723)	(0.719)	(0.703)
Sargan test (*p*-value)	(0.654)	(0.779)	(0.965)	(0.894)

Note: t-statistics are reported in parentheses. ***, **, * represent significance at the 1%, 5% and 10% level, respectively. AR (2) is test for second-order serial correlation in the first-differenced residuals. The Sargan test is for test of over-identifying restrictions.

Moreover, we find that there is a negative and significant relationship between unemployment rate (UE) and marriage rate (see column 1 and 2 of Table 3), meaning that an increase in unemployment rate in a province decrease marriage rate. This is in line with previous studies on determinants of marriage and household formation (e.g. Ahn & Mira 2001; Ekert-Jaffe & Solaz, 2001; Moghadasjafari & Yaghobi, 2007). Our findings also indicate that higher expenditures in higher education (as a proxy for education) is negatively associated with marriage rate, as the coefficient for ED is negative and significant ($p< 0.01$). This finding is consistent with other studies in Iran that documented a delaying effect of education (particularly women's education) on marriage and fertility (e.g., Vahidnia, 2007; Abbasi-Shavazi & McDonald, 2006). Finally, the coefficient of the

D_{MGLOAN} is positive and significant suggesting that government special marriage loan to the young couples increase the marriage rate. Therefore, this type of financial supports should be continued by the government of Iran.

The post estimation tests for autocorrelation and instrument validity are reported at the bottom of Table 3. For both models (columns 1 and 2), the tests show no evidence of serial correlation as AR(2) is not significant at conventional levels of significance. The Sargan tests indicate no evidence of miss-specification at conventional levels of significance. Thus, the dynamic panel model is a good specification for marriage rate in the sample.

In addition, we removed Tehran province (capital) from the sample and looked only at other provinces for investigation. This is because Tehran is the only province in the sample where housing prices and rents are much higher than other provinces. Thus, it might be outliers and its removal may affect our findings. The results of GMM regressions for sample without Tehran are reported in columns 3 and 4 of Table 3. As can be seen, there is a negative and significant association between HP and MG as well as HR and MG. This suggests that removing Tehran from the sample does not affect the results significantly.

6. Conclusion and policy recommendations

Controlling for other relevant economic determinants of marriage, our estimates suggest that housing prices and rents have had negative and statistically significant effects on marriage rate in Iran over the period of 2003-2011. The findings of this paper provide some important implications for policymakers. First, policy could be directed towards the development of affordable housing for new married couples to encourage marriage and household formation. Second, government policies could be directed to provide deeper housing finance systems. This is because house loans and mortgages are not common in Iran. *Bank Maskan* is the only bank specialized in the housing sector that offers housing loans (Euromonitor International, 2013).

To some extent, the above mentioned policies have been put into action by the past government through the *Mehr Housing Plan*. Under this plan, property developers are offered free land in return for building cheap residential houses for first-time buyers on 99-yearlease contracts. The government has commissioned agent banks to offer loans to property developers, which can then prepare the land and begin construction projects (Euromonitor International, 2013). However, several factors have led many observers to conclude that this plan was not successful to encourage marriage among young people: (1) the plan is not only for young people and all low and middle income households have been eligible to apply for this type of housing; (2) the standard and quality of houses are low and size of houses are small; (3) houses are built far from business and industrial districts (e.g., BBC, 2011; Akhoundi, 2013).

Although the past government (leaded by *Mahmoud Ahmadinejad*) has attempted to contribute to housing needs of young Iranians in order to increase marriage however the

officials of the new government (leading by *Hassan Rouhani*) believe that the role of government in the housing market should be reduced and allow private sector balances the housing market (Akhoundi, 2013). This is because the public sector is less efficient than the private sector in housing construction in developing economies (Lee, 2007). The extent of government intervention in the housing market should be tied to the monitoring and adjusting role. For example, investment demands and speculations in housing market are among the major drivers of high property prices in Iran. The high level of investment demands for properties is mainly due to presence of high risks for holding other types of assets and a good hedge against-inflation characteristic of properties in Iran (e.g., Masron & Gholipour, 2010). Therefore, policymakers need to redefine taxing system on property transactions. For instance, government can levy taxes on frequent real estate transaction to control speculation demands for houses. Taxes can also be levied on capital gains to prevent speculation purchases of houses (e.g., Gholipour, 2012; Research Center of Information Technology, 2008). Additionally, the government can levy taxes on long-term empty dwellings or vacant investment houses in order to increase housing supply in rental market. According to Akhondi (2013), the Minister of Road and Urban Development, there are more than 500,000 vacant investment houses in Tehran where most of the middle and low income groups are suffering the high rate of inflation, housing prices and rents.

Furthermore, economic sanctions[9] imposed on the economy of Iran by the UN, the U.S. and European Union has significantly increased the price of imported goods (e.g. difficulties of import financing) including construction materials. As a result, this rise in

[9]The sanctions are used to stop Iran's nuclear proliferation program. The UN, the US, and other Western powers have accused Iran of pursuing nuclear weapons capability. Iranian officials have categorically denied these accusations and claimed that their nuclear program is designed for civilian purposes (Bahgat, 2006).

housing construction costs has translated into an increase in housing prices. Moreover, the inflationary expectations of the sanctions have led to irrational exuberance in real estate market which in turn increases housing prices (Shahrestani & Kalbasi, 2008). Since marriage is negatively affected by increases in housing prices, Iranians authorities should avoid the escalation of the crisis and reduce external conflicts in order to reduce housing prices and stabilize other macroeconomic indicators to encourage family formation among young Iranians.

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