

Evaluating the Impact of Housing Market Liberalization on the Timing of Marriage: Evidence from Egypt

By Ragui Assaad^a

Caroline Krafft,^{b*}

and

Dominique J. Rolando^c

Abstract

The transition to adulthood around the world is increasingly characterized by young people's desire to form independent households. Forming such households requires buying or building a dwelling or obtaining a rental unit. Policies governing housing markets, such as rent control, and limited financing options have historically made access to housing for young couples challenging. In this paper, we use a difference-in-difference approach to evaluate how the liberalization of rental markets in Egypt affected the timing of marriage. We find that Egypt's 1996 rental reforms accelerated marriages and led to a reversal in the trend of rising age at marriage.

Keywords: Marriage; Housing; House Prices; Living Arrangements; Egypt

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^a Humphrey School of Public Affairs, University of Minnesota, 301 19th Avenue South, Minneapolis, MN, 55455, USA.

assaad@umn.edu

ORCID: 0000-0002-2608-5335

^{b,*} Corresponding Author. Department of Economics, St. Catherine University, 2004 Randolph Avenue, St. Paul, MN, 55105, USA

cgkrafft@stkate.edu

ORCID: 0000-0001-6906-9418

^c Department of Applied Economics, University of Minnesota, 1994 Buford Ave., Saint Paul, MN, 55108, USA.

rolan059@umn.edu

1. Introduction

Many countries around the world pursue housing policies that restrict the supply of rental housing in an attempt to make housing more affordable (McCall 1988a; McCall 1988b; Early 2000). Rent control policies in particular are intended to limit rent increases and protect tenants, but such policies also limit the housing available to new entrants to the housing market. Given the increasing global trend toward independent living at marriage (Bongaarts 2001; Lloyd 2005), housing markets can strongly interact with family formation.

This paper uses the case of Egypt, which liberalized its longstanding rent control laws in 1996, as a natural experiment to evaluate the effect of rent liberalization on the timing of marriage. Since the 1960s, Egypt had strict rent control, with rents fixed in nominal terms at the start of rental contracts. Contracts were, by law, of indefinite duration, and could even be passed on through inheritance across generations. In 1996, Egypt introduced the “new rent” law, which allowed new rental contracts (signed after the adoption of the law) to be of limited duration and gave landlords the flexibility to adjust the rent upon renewal (Assaad and Ramadan 2008; Middle East Library for Economic Services 2011; Shawkat 2020). Previous work suggested that the reversal in the rising trend in the age at marriage in Egypt may be attributable to the adoption of these housing market reforms (Assaad and Ramadan 2008; Assaad and Krafft 2015a). However, these studies did not undertake a detailed and rigorous policy evaluation. We use a difference-in-difference methodology to determine the causal impact of these reforms on the timing of marriage in Egypt.

In addition to the natural experiment of rent liberalization, what makes the Egyptian case particularly interesting for studying the relationship between housing markets and family formation is the prominent role housing plays in marriage negotiations. Marriage in Egypt is

essentially a contract between families, where the groom's side is expected to provide housing (Hoodfar 1997; El Feki 2013). With the increased expectation for independent living at marriage, housing availability for newly married couples takes on increasing importance.

The global literature on rent control has identified a number of different impacts of such policies on the price, quantity, quality, and distribution of housing. Rent control benefits the tenants of controlled units, but increases the prices of uncontrolled units, which yields negative average benefits and increases inequality (Early 2000; Roland and Svarer 2002; Diamond et al. 2018; Mense et al. 2018). The quantity of rental units decreases as a result of rent control, as does the quality (Gyourko and Linneman 1990; Sims 2007; Diamond et al. 2018). The design of rent control policies (particularly their rigidity) affects their impacts (Zheng et al. 2007). Studies have shown that rent control affects other economic outcomes beyond (but related to) the housing market, for instance causing longer unemployment durations, reduced labour mobility, longer commute times, or increased religious conflict (Krol and Svorny 2005; Svarer et al. 2005; Field et al. 2008).

Our paper is the first, to our knowledge, to research the impact of rent control on family formation. Housing affordability, generally, is an important determinant of household formation outcomes around the world (Franc 2006; Farzanegan and Gholipour 2016; Di Stefano 2019; Xu et al. 2019; Su et al. 2020). While this paper pertains to Egypt, with its specific patterns of family formation and distinctive housing regulations, it could be relevant to other cases where family formation is increasingly tied to independent living arrangements and where restrictive housing regulations might hinder such arrangements.

We begin by exploring the patterns of living arrangements around the world and the connection between living arrangements and marital status in Egypt. We illustrate the rising

trend in independent living for married couples and thus the linkage between household formation and housing markets. We then review the housing policy landscape in Egypt, including rent control laws and their liberalization in 1996. Our subsequent multivariate analyses take advantage of the change in housing laws to measure the effects of housing policies on the timing of marriage. Our difference-in-difference method relies on local variation in the availability of housing subject to the “new rent” law and the fact that the availability of such housing is likely to have a greater effect on cohorts of men and women coming of marriageable age after the passage of the 1996 law.

2. Background

2.1 Global housing patterns

Before reviewing the relationship between marriage and housing in Egypt, we present some housing and living arrangements statistics from census data for comparator countries (Minnesota Population Center 2020), in order to place Egypt in a broader international context. As shown in Table 1, Egypt has a higher share of rentals in housing relative to comparator countries, with the possible exceptions of Iran and Turkey. Nevertheless, the rental share of housing has been declining steadily in Egypt from 1986 to 2006, despite the introduction of the “new rent” law in 1996. Egypt also stands out in terms of the percentage of households with nuclear living arrangements. The share of nuclear households is highest in Egypt among all the comparator countries with the exception of Iran and has risen steadily from 1986 (83%) to 2006 (91%). There is a tendency for this proportion to increase in most countries over time as couples pursue more “modern” living arrangements, but the increase is particularly pronounced in Egypt. [Table 1 near here]

2.2 *Marriage and Housing Decisions in Egypt*

Marriage in Egypt increasingly heralds the formation of a new, independent, nuclear household, underscoring the importance of access to housing to the ability to marry. Prospective grooms need to be economically ready for marriage by first finding employment upon finishing school, preferably a “good job” that is both lucrative and socially prestigious (Dhillon et al. 2009; Assaad et al. 2010; Egel and Salehi-Isfahani 2010; Assaad and Krafft 2014; Gebel and Heyne 2016; Krafft and Assaad 2020). Once they have secured a good job, men are both more attractive marriage partners and more financially able to accumulate the necessary resources to marry. The most important of these economic preconditions to marriage is the ability to secure acceptable housing for the couple (Amin and Al-Bassusi 2004; Dhillon et al. 2009).

The initial acquisition of housing is estimated to constitute 38% of total marriage costs in Egypt (Salem 2015). Customarily, the acquisition of housing is primarily the responsibility of the groom and his family. If a groom had to cover the entire cost of marriage from his own savings, it would take an average of eight years of wages in Egypt to cover the costs of marriage. The initial housing costs are equivalent to approximately three years of the groom’s wages (Assaad and Krafft 2015a).

The need for personal or familial savings, which may take a long time to accumulate, contributes to marriage delays, which are further compounded by rising education levels and protracted transitions to the kind of work that signals economic readiness for marriage for young men (Assaad et al. 2010; Bongaarts et al. 2017; Nilsson 2019; Krafft and Assaad 2020). Being ready requires, among other things, securing housing arrangements that are deemed acceptable to the bride and her family. In anthropological research, both young people and their parents explained that increasing costs related to the need to set up a separate household were departures

from historical patterns that contributed to delays in marriage (Amin and Al-Bassusi 2004). Men's responsibilities, especially the cost of housing and finding a job to pay for marriage costs, are the biggest barriers to marriage (El Feki 2013). Pre-marital negotiations around housing may even include specifics such as the location of the flat (Hoodfar 1997).

Delays in the transition to marriage also delay the transition to other adult roles, including independent living, socially sanctioned sexual relations, and childbearing, which are largely restricted to marriage according to prevailing norms in the region (Hoodfar 1997; Rashad et al. 2005; Salehi-Isfahani and Dhillon 2008; Dhillon et al. 2009; Egel and Salehi-Isfahani 2010; El Feki 2013). The delays in marriage and the anxiety associated with them have become known in the literature on youth transitions in the Middle East and North Africa (MENA) region as “wait adulthood” or “waithood” for short (Singerman 2007, Dhillon, Dyer, & Yousef, 2009). Thus, the functioning of the housing market and associated policies play a crucial role in enabling or constraining the transition to adulthood.

To illustrate the linkage between marriage and living arrangements, we use data from Egypt's population censuses to examine the percentage of individuals that live with at least one parent, by marital status, urban/rural location, age group, and sex (Table 2). The vast majority of never married individuals aged 15 to 34 live with their parents, with that percentage not changing much from 1986 to 2006. This pattern held for men and women in urban and rural areas. While the percentage of never married individuals living with their parents is lower for those 35 to 54, this is presumably because there is a higher likelihood that the parents are deceased. Moreover, given the near universality of marriage by age 40 in Egypt (Rashad and Osman 2000; Salem 2015; Krafft and Assaad 2020), there are fewer never married individuals in this age range. A smaller and declining percentage of currently married individuals live with their parents. Among

currently married men aged 15 to 34, the share living with at least one parent declined from 16% in 1986 to 7% in 2006 in urban areas and from 35% to 10% in rural areas. Since the tradition in Egypt is for the bride to move to her in-law's family if extended household living arrangements are adopted, an even smaller proportion of currently married women live with at least one of their parents. The sum of the percentage living with their parents for men and women indicates the prevalence of extended households in Egyptian society. Extended household living is on the decline in Egypt, involving no more than 8% of couples in 2006.

[Table 2 near here]

2.3 *Housing Policy: Rent control and liberalization*

One of the reasons that housing contributes to delays in marriage and adulthood is the poor state of housing policy in Egypt. Evidence from a number of developing countries demonstrates that housing policy can majorly affect the functioning of the housing market. In particular, substantial public ownership of land, poorly enforced property rights, rent control, and lack of financing are important issues globally. Over-regulation is particularly problematic in limiting supply (Malpezzi 1999; Buckley and Kalarickal 2005).

In part as the result of policy challenges, costs of homeownership are atypically high in Egypt, and there are limited opportunities to acquire low-income housing or starter homes. At the same time, credit in the form of a mortgage is not readily available (Sanders 2005; World Bank 2005; Warnock and Warnock 2008; Dhillon et al. 2009). The housing loans available are typically provided by government agencies, and the private market for residential mortgages is generally quite limited (Erbaş and Nothaft 2005; Hassler 2011). Large down payment requirements and short loan periods are also challenges that exacerbate the unaffordability of mortgage finance (Erbaş and Nothaft 2005).

Rental housing may offer a speedier alternative to access housing that does not require substantial capital upfront, but rental units are not necessarily available or affordable, particularly prior to the passage of the “new rent” law. Historically, Egypt had a heavily regulated rental market (McCall 1988a). Law 52 of 1969 set rent control policies that persisted until 1996, although there were amendments in 1976, 1977, and 1981 (McCall 1988a; Shawkat 2020). The law, summarized in Table 3, initially allowed annual rents fixed in nominal terms at 3% of the land value at the time of construction and 5% of the construction costs (McCall 1988a). Amendments subsequently increased these percentages and allowed for 7% inflation, but rents were still very low relative to housing investment costs and actual inflation rates (McCall 1988a). The 1969 law gave tenants the right to retain their tenancy along the original contractual terms indefinitely, even through inheritance (McCall 1988a).¹

Rent control limited the return on investment for housing construction in the formal private sector and therefore caused a reduction in the supply of rental housing (McCall 1988b). The costs and stringency of rent control led to landlords demanding large upfront payments of “key money” or “advance rent” to access formal rental contracts (McCall 1988a; Assaad and Ramadan 2008; Shawkat 2020).

The rental landscape substantially changed with rent liberalization in Law No. 4 of 1996 (Middle East Library for Economic Services 2011; Shawkat 2020). The law only applied to new rental contracts, leaving existing rent control arrangements intact. It therefore became known as the “new rent” law. Table 3 summarizes the “new rent” law as compared to previous legislation. The “new rent” law allowed for definite duration rental contracts rather than indefinite tenancy (Shawkat 2020). The law allowed the landlord to increase rent (which was fixed under the old law) with contract renewal (Shawkat 2020). The landlord could also opt not to renew the contract

at the end of the contractual period (Assaad and Ramadan 2008; Shawkat 2020). Furthermore, the law made it substantially easier to evict tenants (Shawkat 2020).

Altogether, the law was a relatively sweeping rent liberalization, albeit one that grandfathered in pre-existing contracts. The rent liberalization substantially changed the incentives to build and invest in new housing. Young people seeking to leave their natal family, marry, and rent their first unit faced a changed market. For example, between 1996 and 2006 the number of rental households increased 30%, from 2.9 million to 3.7 million, driven primarily by 1.1 million “new rent” households, as “old rent” households declined from 2.8 million to 2.6 million (The Built Environment Observatory (BEO) 2018).

[Table 3 near here]

3. Data

3.1 Data sources

In order to analyse the relationship between housing and marriage, we need data on age at marriage, the nature of the housing market in the individual’s location of birth, and the timing of other key transitions in the individual’s life course, such as schooling and employment. The study primarily uses the 2012 wave of the Egypt Labor Market Panel Survey (ELMPS). The ELMPS 2012 is the third wave of a nationally-representative panel survey first fielded in 1998. The subsequent 2006 and 2012 waves tracked previous wave households and split households, correcting for observable attrition through panel weights. The waves also added a refresher sample of new households. Base wave and refresher sampling was undertaken as a randomized stratified cluster sample (with the sampling strategy incorporated into the weights). We analyse data from the combined sample that includes both previous wave and refresher households.² Our final working sample of individuals aged 15 to 54 from the ELMPS 2012 contains 12,704 men

and 12,653 women. We also draw on microdata from the 10% public use sample of the 2006 Egyptian Population and Housing Census,³ available through the Integrated Public Use Microdata Series (IPUMS) for information on local housing markets (Minnesota Population Center 2015).

3.2 *Outcome*

Our primary outcome of interest is age at marriage, which we model and describe in discrete-time terms from the ELMPS 2012 data (see below for details).

3.3 *Covariates of interest*

We are interested in the impact of rent liberalization and the expansion of “new rent” housing on age at marriage. The 2006 census in Egypt includes information on both the type of housing (rent or own) and the rental law under which the housing is rented (“old rent” versus “new rent”). We summarize this information at the district level (which is the second level of administrative geography in Egypt) and merge these district-level summary statistics into the ELMPS 2012 individual-level data. There are 250 districts in Egypt for which we have survey data and summary housing data (out of a total of 347 districts in the 2006 census).

Our two key covariates from the 2006 census are (1) the proportion of rental housing in all housing in the district of birth, and (2) the proportion of “new rent” units among all rentals. We focus on “new rent” units among rentals to separate out the effects of the reform from the general availability of rental housing. We standardize the housing market measures to have a mean of zero and standard deviation of one, in order to be able to discuss relationships in terms of standard deviations. We also interact these two key covariates with a dummy for those in cohorts born 1972 or later (men) or 1977 or later (women) who would have been exposed to the

rental reform. The main effect for this dummy (which is based on the ELMPS 2012 data) is included in our models as well.

Information on local housing markets can help identify the effect of housing on the timing of marriage. Local housing market conditions, not individual housing outcomes, are our key covariate of interest, because we are interested in how reforms in the housing market influence marriage timing. To avoid the potential endogeneity of individual housing and migration decisions, and thus the choice of current place of residence, we use information on the housing market from the individual's location of birth rather than the location of current residence.

3.4 Controls

We use a rich set of characteristics at the family and individual level from the ELMPS 2012 as controls for factors that might confound the relationship between housing and the timing of marriage. Specifically, we control for the individual's labour market status, whether the individual is in school, own and parents' levels of education, father's employment status and occupation (when the individual was age 15), number of male and female siblings, age, region of residence and urban/rural status. We estimate our models separately for men and women.

4. Methods

We begin with descriptive analyses of the change in the age of marriage across birth cohorts. We then examine the costs of marriage and housing. From there, we proceed to a multivariate analysis of the determinants of marriage timing. To do so we construct an annualized longitudinal data set for each individual over time using time-varying information on marital, educational, and employment status, obtained from retrospective data in the ELMPS 2012, and link this data to housing characteristics at the location of birth from the 2006 census. Each

individual is followed from age 15 until the time of first marriage or the time of the survey if the individual is still unmarried when interviewed.

Because the age of marriage is recorded in years and there are a number of tied observations in each year, we estimate discrete-time hazard models rather than continuous-time models. Such models are common for estimating age at marriage and other key demographic events (Schellekens 2017; Grant and Pike 2019; Zang 2019). One advantage of these models is that they account for the right censoring of age at marriage (since many individuals observed at the time of the survey are not yet married). We denote marrying at a particular age a as T_a . The outcome of interest is the probability of marrying at a particular age if one had not yet married. This can be characterized by the discrete-time hazard function, $h_{i,a}$ (Jenkins 1995):

$$h_{i,a} = \Pr (T_a | T_a \geq a) \quad (1)$$

Hazards are presented in our descriptive statistics. We use a discrete-time proportional hazards model, the complementary log-log model, for the multivariate analysis. Discrete-time survival analysis can be undertaken with complementary log-log or logit models (Jenkins 1995). The complementary log-log model has the advantage in terms of ease of interpretation. Effects of covariates can be presented as hazard ratios relative to a non-parametric baseline hazard, similar to the Cox continuous-time proportional hazards model. Additionally, survival analysis methods allow each individual to have time-varying (such as school enrolment) as well as time-invariant characteristics (such as parental education), which can be related to marriage timing. We structure the data so that an observation is a combination of an individual and a year of age to enable our use of age-varying covariates (for example, being enrolled in school will vary with age). Incorporating covariates $X_{i,a}$ the complementary log-log model can be estimated as (Jenkins 1995):

$$h_{i,a} = 1 - \exp\{-\exp[\theta(t) - \beta X_{i,a}]\} \quad (2)$$

or

$$\log(-\log(1 - h_{i,a})) = \theta(a) + \beta X_{i,a} \quad (3)$$

where $\theta(a)$ refers to a series of dummy variables identifying the time since age 15. When exponentiated, the estimated coefficients, β , can be interpreted as hazard ratios. The hazard ratio then describes the relationship between a one-unit increase in a covariate and the hazard of getting married relative to the baseline hazard, which can be extracted from $\theta(a)$.

In order to identify the impact of the “new rent” law in Egypt, we specify a difference-in-difference discrete time hazard model. Difference-in-difference modelling is a quasi-experimental approach. It takes advantage of longitudinal information (in our case, we have information pre- and post- housing reform) to compare those exposed to some “treatment” (in our case, a higher level of “new rent” housing) pre- and post- the actual implementation of the treatment. The model allows for a constant difference in outcomes pre-treatment and assumes that difference would continue in the absence of the “treatment” (the so-called parallel trends assumption). A difference-in-difference approach is commonly used in the literature to identify the impact of rent control when it ends or is reformed (Sims 2007; Autor et al. 2012).

In our case, an observation is a person-year (year of age), with the model also including district of birth level controls, subscripted d . This difference-in-difference model is specified as follows:

$$\begin{aligned} & \log(-\log(1 - h_{i,a})) \\ &= \alpha_1 R_{i,d} + \alpha_2 N_{i,d} + \alpha_3 M_{i,c} + \alpha_4 R_{i,d} * M_{i,c} + \gamma N_{i,d} * M_{i,c} + \theta(a) + \beta X_{i,a} \end{aligned} \quad (4)$$

$R_{i,d}$ represents the local percentage of rental units in all housing estimated based on the 2006 census using the individual’s district of birth and $N_{i,d}$ the local percentage of “new rent” housing

in all rental housing, estimated likewise.⁴ $M_{i,c}$ is a dummy for men born 1972 or later and women born 1977 or later (the c subscript denotes cohort), the age group whose marriage timing is most likely to be affected by the new rent law passed in 1996. The impact of the “new rent” law is given by the coefficient γ on the interaction between local percentage of “new rent” housing and being born after the cut-off year. This coefficient represents the change in the hazard of marriage for an individual born in 1972+ (men)/1977+ (women) who lives in an area with one standard deviation higher new rentals, controlling for main effects of cohort and housing conditions. Essentially, our difference-in-difference model compares marriage timing for individuals born in districts with a higher share of new rent (in 2006) to districts with low new rent (in 2006) across cohorts (e.g., pre-1972 and 1972+).

5. Results

5.1 Descriptive Analysis

5.1.1 Trends in Age at Marriage

We begin our analysis by examining trends in the age at marriage in Egypt by birth cohort. Figure 1 shows the evolution of the hazard of first marriage at each age by birth cohort, separately for men and women. Egypt exhibits a striking reversal in the initial increase in marriage ages. For men, the median age at marriage rose from about 27 for those born in 1960-1965 to about 29 for those born in 1966-1971, and then began declining steadily to reach 27 for those born in 1972 and thereafter. The hazards of marriage are much higher around ages 25-30 for those born post-1972 than pre-1972. A similar pattern is noticeable for Egyptian women. Hazards show rising age at marriage, with hazards shifting to later ages, comparing the 1960-

1965, 1966-1971, and especially 1972-1978 birth cohorts. However, the 1979-1985 and 1986-1997 birth cohorts have the highest hazards over the ages 20-25 (albeit less early marriage before age 18 than earlier cohorts).

One of the key hypotheses in this paper is that the reversal of the rising trend in the age at marriage in Egypt can be attributed to developments in the housing market, and in particular to the enactment of the “new rent” law of 1996. Given that the law only applied at the margin to new rental contracts, we assume that it took some time for it to have an effect on rental markets, with the earliest effects probably being no earlier than 1998. Assuming that the average man was marrying at age 27/28, we would expect to begin to see a noticeable impact of the housing law on the age at marriage for those born around 1970/71. This period is in fact the point at which we observed the reversal in median age of marriage in Figure 1. In our empirical tests below, we set the cut-off for those who would be affected by the law as men born in 1972 or later to make sure that enough time has passed to allow the law to have an effect on the ground. When the law was passed, the median woman was marrying at the age of 21, so that the cohorts of women affected by the law would be the 1977 birth cohort and later. This is in fact the birth cohort where we observe the reversal for women in Egypt.

[Figure 1 near here]

The reversal in the trend towards later ages at marriage timed around the housing reform happened despite other factors continuing to trend in a direction that would lead to later ages at marriage. Education continued to rise across cohorts and more educated individuals tend to marry later (Assaad and Krafft 2015b; Salem 2015). Adverse developments in the labour market, particularly the decline of public sector employment (Assaad and Krafft 2015c), should have pushed age at marriage higher (Krafft and Assaad 2020). Rising expectations for adult living

including independent housing (Singerman 2007; Assaad and Barsoum 2009) would be expected to further increase ages at marriage, a point we describe further below. The housing market and rent liberalization is the rare factor that would decrease age at marriage. Egypt is relatively unusual in the region for having a decline in age at marriage. For example, Tunisia experienced large increases in age at marriage over several cohorts (Assaad et al. 2017). Jordan has experienced more modest increases, but also notably has a more robust rental market than Egypt or Tunisia (Assaad et al. 2017).

5.1.2 Marriage Costs and Housing

We now move to an examination of housing affordability ratios and the share of initial housing costs in total marriage costs for newly married couples (2006 and 2012) presented in Table 4.⁵ We construct an affordability ratio by dividing the initial cost of housing at marriage by the current annual monthly wages of the groom. Note that these are current annual wages, and thus likely to be higher than wages prior to marriage and lead to an underestimate of the affordability ratios. In both 2006 and 2012, Egyptian grooms would have had to devote around two full years of wages (22 months in 2006 and 25 in 2012) to cover their initial housing costs if they were paying them in full. In terms of the groom's share of the housing costs, they are equal to almost a year (10 months) of wages after accounting for the fact that the groom's family helps as well as, to a much lesser extent, the bride and her family. Examining the share of initial housing costs relative to the total costs of marriage, we confirm that housing costs are a substantial obstacle to marriage in Egypt. It is notable that the share of housing costs in the marriage budget in Egypt in 2012 was 28%. Overall costs and housing costs have risen over time, driven by increasing standards of living and the increase in nuclear living shown in Table 1.

[Table 4 near here]

5.1.3 “New Rent” Housing in Egypt

In order to analyse the effects of the “new rent” law in Egypt, we use data from the ELMPS 2012. First, we calculate the mean cost of housing at marriage for men who identify as renters at the time of marriage and who were married in the preceding 10 years. We find that the average initial cost of housing at marriage for those renting under the old rent law is approximately £E 14,777 compared to approximately £E 10,772 for those renting under the “new rent” law.⁶ We also calculate the median initial cost of housing at marriage under both laws, in case outliers were skewing the results. For those renting under the old law, the median is approximately £E 10,000, while it is £E 5,000 under the “new rent” law.⁷ Using both measures of central tendency, we find that those who rent under the “new rent” law incur lower initial housing costs at marriage than those who rented under the old rent laws, which most likely involved putting down a large amount up-front in key money or advance rent to obtain a rental contract.

5.2 Multivariate Analysis: Timing of Marriage and the Housing Market

We estimate a discrete-time proportional hazards model of age at marriage and use a difference-in-difference specification to test for the effect of the enactment of the “new rent” law in 1996 on the timing of marriage. Given the prevailing ages at marriage among Egyptian men and women at that time, we expect the law to affect the marriage prospects of the cohorts of men born in 1972 or later and women born 1977 or later. We therefore argue, as described in the methods section, that the effect of the law is identified by the interaction terms between a dummy for being born in 1972 (men)/1977 (women) or later and the variable capturing the percentage of housing subject to the “new rent” law among rentals in the individual’s district of

birth in 2006. We also include the interaction between the birth cohort dummy and the percentage of rental housing in all housing. The un-interacted form of these two variables captures the potential selection effect of being born in districts with high percentages of rental housing and high percentages of “new rent” housing in rental housing, including any time-invariant confounding variables that are associated with a high prevalence of rentals, “new rent” units, and the age of marriage.⁸

Table 5 displays the results of these estimates in the form of hazard ratios, centred around one, separately for men and women. A hazard ratio greater than one implies that the timing of marriage is accelerated by a one unit increase in the covariate, while marriage is delayed when the ratio is smaller than one. We find that a one standard deviation increase in the percentage of rentals under the “new rent” law increases the hazard of marriage by approximately 14% for men born in 1972 or later and 12% for women born 1977 or later. This finding is perhaps the most important result of this paper. This result confirms that the reversal of the trend in the male age at marriage first noted by Assaad and Ramadan 2008 based on 2006 data has been sustained and can be attributed to the introduction of the “new rent” law, as they suggested. The increased availability of “new rent” housing over time potentially explains the reversal in the trend towards later ages at marriage, with a shift back towards earlier marriage among exposed cohorts, observed in Figure 1.

Furthermore, we find that a one standard deviation increase in the percentage of rentals also increases the hazard of marriage by about 10% for men born in 1972 or later and 9% for women born 1977 or later. Both results confirm that the new rental law contributed to reversing the earlier rising trend in the age at marriage. The hazard ratio associated with the un-interacted new rent percentage, indicating the pre-1972 (men)/1977 (women) effect, is barely above one

and insignificantly different from one. The hazard ratio associated with the share of rent in all housing is also insignificant for men and significant for women but below one, suggesting that, if anything, living in areas with high rental rates is generally associated with later marriage. Thus, if a selection effect does exist, it appears to be limited and going in the direction of later marriage in high rental areas. No significant effect is associated with the un-interacted dummy for being born in 1972/1977 or later, suggesting that the observed reversal in the age of marriage only occurred for those born in areas with high shares of rentals and “new rent” units among rentals.

[Table 5 near here]

The effects of other covariates, presented in full in the Appendix, Table 6, are mostly in the expected direction. The effect of employment status on the timing of marriage, as well as its potential endogeneity,⁹ is explored in Krafft and Assaad 2020. Employment in the public sector and in the formal private sector tends to speed up marriage for men in Egypt relative to informal private sector employment, as it is an effective signal that a man is economically ready for marriage. Unemployed and out of the labour force men have a much lower hazard of marriage compared to those in employment, as expected. Women, by contrast, tend to work in the reference state of private sector informal wage work to accumulate savings prior to marriage, then leave such work in anticipation of marriage, such that all other states have significantly higher hazards of marriage; for women there is no penalty to being unemployed or out of the labour force given traditional male breadwinner/female homemaker norms.

As expected, being in school delays marriage considerably, but the effect of schooling goes beyond the effect of simply being in school. The hazard of marriage falls steadily with the level of education for men but has a complex pattern for women. Controlling for own education, the hazard of marriage has a complex relationship with parental education, which is presumably

a proxy for social class. Being from a higher social class could contribute to the family's ability to pay for the costs of marriage, but it could also raise expectations about the potential spouse and the quality of the marriage to be achieved (Assaad and Krafft 2015d). Our results suggest a non-linear relationship between social class and the timing of marriage. For instance, among men the hazards of marriage are lowest for those who have mothers with basic education and highest for those who have mothers with higher education.

5.3 *Simulations*

In order to further illuminate the relationship between housing and the timing of marriage, we use the results of our multivariate analysis to predict what happens to the age of marriage as we change the characteristics of the local housing markets. We specifically vary housing market characteristics from one standard deviation below the mean to one standard deviation above the mean and predict the proportion married at each age. The simulations are conducted for a reference individual who is a secondary graduate, was in school until age 18 and then was a private informal wage worker (men) or out of the labour force (women), had both parents educated up to the secondary level, and a father who was a managerial wage worker when the individual was 15. In addition, the reference individual was born in Greater Cairo, has one brother and one sister and is 35 years old at the time of the survey.¹⁰ The figures below depict how housing market variables affect the proportion of respondents married at each age, equivalent to a failure function in survival analysis terms.

We simulate the interaction between the share of “new rent” units in all rental units and the dummy indicating being born in 1972 (men)/1977 (women) or later (Figure 2). A shift of the curves to the left indicates faster transition to marriage. The most notable result is that increasing the proportion of “new rent” units among rentals by two standard deviations shifts the curve

substantially to left, for males born since 1972. The median age of marriage for this group goes from 30 to 29 if their place of birth goes from one standard deviation below the mean in “new rent” housing to one standard deviation above the mean. For those men born prior to 1972, the change is much smaller. For women, because of the direction of the main effect of being born 1977 and thereafter is in the opposite direction, the gap between before and after for the proportion married at +1 SD of new rent housing is less dramatic, but the gap between -1 SD and +1 SD after is quite large and better denotes the effect of the law. Notably the women’s median age at marriage in the simulation is 24 for every status except +1 SD of new rent after, for whom the median age at marriage is 23. We posit that the shifts in age at marriage can be attributed to the introduction of the 1996 housing law. These simulation results control for the proportion of rentals in all housing. If the law resulted in an increase in the availability of rentals overall, as one would expect it to, the effect of the law on speeding up marriage would be even larger.

[Figure 2 near here]

6. Conclusion and policy implications

Housing plays an important role in enabling young people in Egypt to marry, a crucial stage in their transition to adulthood, in a context where independent living at marriage is increasingly becoming the norm. Although Egypt shares with other parts of the world a trend toward later marriages for young women, it has had the distinction of substantial increases in the age of marriage among young men as well, and, therefore, fairly persistent spousal age gaps (Mensch 2005). While demographers and policymakers generally applaud delaying marriage for young women and reducing the rates of teen marriages, there is considerably more social and policy anxiety when men’s ages at marriage rise as well, especially in a context where the transition to adulthood is strongly predicated upon marriage (Assaad and Barsoum 2009; Salem 2016). The

rise in the age at first marriage is widely attributed to men's growing inability to signal economic readiness for marriage in a cultural milieu where men and their families are still expected to shoulder the bulk of the economic burden, including the provision of the marital dwelling (Assaad et al. 2010; Krafft and Assaad 2020). In such a context, housing policies and the functioning of housing markets play a critical role in facilitating the transition to marriage. When the acquisition of housing requires the accumulation of large sums of money up-front, the economic burden on men increases and marriage will likely be delayed. If, on the other hand, it is possible to acquire rental housing fairly easily or finance purchases with long-term loans, the initial costs of housing will not loom as large.

In light of the analyses presented in this paper, we are able to gain insights into the timing of marriage and the functioning of housing markets. We first noted the dramatic reversal in the trend of the age at marriage among Egyptians, with a fairly sharp rising trend reversing itself for young men born around 1972, and likewise for young women born around 1977. We then noted, as Assaad and Ramadan 2008 had before us, that the cohorts experiencing this reversal are exactly the same as would have been affected by the "new rent" law passed in 1996 that made it easier to acquire market-rate rental housing. We formally test the effect of the law on the timing of marriage using a difference-in-difference setup. This approach allows us to distinguish between the effects of the law and the effect of time-invariant unobservables that may be correlated with both increased availability of rental and "new rent" rentals and with the timing of marriage.

We find that the introduction of the "new rent" law did increase the hazard of marriage for young men born after 1971 and young women born after 1976. Each standard deviation increase in the share of "new rent" units in rental housing in a young person's district of birth

increases the hazard of marriage by 14% for men born after 1971 and 12% for young women born after 1976 compared to those born earlier. The main effect of this variable is small and insignificant, suggesting that selection on unobservables is not a major concern. Similarly, a one standard deviation increase in the overall share of rental units in all housing raises the hazard of marrying for men born since 1971 by 10% for men (and for women born since 1976 by 9%) relative to those born earlier. In contrast, the main effect of this variable, which probably captures the effect of selection, is a reduction of 8-9% in the hazard of marrying (significant for women but not men). This suggests that places with relatively high availability of rentals are associated with other attributes (e.g., urban living, more modern marriage aspirations) that raise the age of marriage. It is thus necessary to correct for such selection to detect the effect of a greater availability of rentals on the timing of marriage, which is precisely what we are able to do in this paper.

Our results indicate that rent liberalization decreased initial housing costs and accelerated marriage in Egypt. The previous policy of rent control, although meant to reduce the housing cost burden in Egypt, in fact contributed to rising initial costs of housing and delays in marriage. Rent control dried up the supply of rental housing or made it contingent on young couples to come up with large upfront sums for key money or advance rent, or for outright housing purchase or construction. Once the rent liberalization policy was implemented to allow for market-rate rentals, the age at marriage began falling. Even if they have to pay more rent on an ongoing basis (Attia 2016), young people are at least able to get an earlier start on their marital lives.

Another set of policies that could have similar effects is to substantially increase the availability of housing finance (Chiuri and Jappelli 2003; Erbaş and Nothaft 2005). However,

developing a comprehensive and inclusive housing finance system in conjunction with appropriate government regulation is a long-term task (Renaud 1984; Okpala 1994). It is also challenging to set up such a system in a context characterized by widespread informality of employment, as is the case in Egypt.¹¹ In the meantime, more flexible rental housing regulations can go a long way in resolving the housing shortages faced by prospective couples.

These results have important implications for global housing policy, as countries throughout the world struggle with design of housing policies to achieve both economic and social goals (Dübel and Brzeski 2006; Ballesteros et al. 2016). While rent control does decrease prices for tenants of rent-controlled units, it raises prices for uncontrolled units (Early 2000; Roland and Svarer 2002; Diamond et al. 2018; Mense et al. 2018). It also reduces supply of rental housing (Diamond et al. 2018). Although intended to increase the security and affordability of housing for *existing* tenants, we demonstrate that such policies appear to have particularly negative effects on the formation of *new* households. This additional—and previously unresearched—impact of rent control should be considered in global housing policy.

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Appendix: Additional Table

[Table 6 near here]

¹ A 2002 decision by the Supreme Constitutional Court limited the transfer of rent control contracts through inheritance to one generation (Assaad and Ramadan 2008).

² See Assaad and Krafft 2013 for more information on the ELMPS. Surveys are publicly available from the Economic Research Forum's Open Access Micro-Data Initiative (OAMDI) at <http://www.erfdataportal.com/index.php/catalog>

³ This is the most recent publicly available census data, and while it predates the ELMPS 2012 wave, since we are trying to describe the housing stock prior to marriage, this is actually an advantage. As well as having preceding housing data, we prefer to use the ELMPS 2012 wave because it has a larger sample, is more recent, and has a larger period post-housing-reform to observe.

⁴ By local, we mean in the individual's district of birth. We use district of birth rather than district of current residence to allay any endogeneity concerns related to migration.

⁵ We focus on costs for marriages in the ten years preceding each survey and compare those statistics due to partial inflation of retrospective costs that confounds assessing trends by year of marriage (Assaad et al. 2018).

⁶ One US\$ was equal to £E 6.1 in 2012 (World Bank 2013).

⁷ Initial housing costs still present under the new rent law could include making the unit ready for habitation (repairs, painting, utilities start-up), as well as first and last month of rent and security deposits. Although the ELMPS 2012 does not have monthly rent, the 2010/2011 Household Income Expenditure and Consumption Survey does, and shows a mean annual rent of £E 3,401 in new rent units (uncontrolled) and £E 2,883 for old rent (controlled) units (Attia 2016).

⁸ As a sensitivity analysis, we also estimated a model with district level fixed effects. The results were substantively similar.

⁹ Since employment and education could be endogenous, as a sensitivity analysis we re-ran our model excluding education, being in school, and labor market status. The results without labor market status and education were substantively similar.

¹⁰ These characteristics were selected as a relatively "typical" profile. For instance, private informal wage work is the most common employment status for men and out of the labor force for women, secondary is the most common education level in Egypt and Greater Cairo is the most populous region. Age 35 is the midpoint of ages we consider.

¹¹ Recent data indicate that formal employment constitutes no more than 38% of total employment in Egypt in 2018 (Assaad et al. 2019).



Figure 1. Evolution of the Hazard of First Marriage by Age, Birth Cohort, and Sex

Source: Authors' calculations based on ELMPS 2012

Notes: Triangle kernel smoother with bandwidth 4.

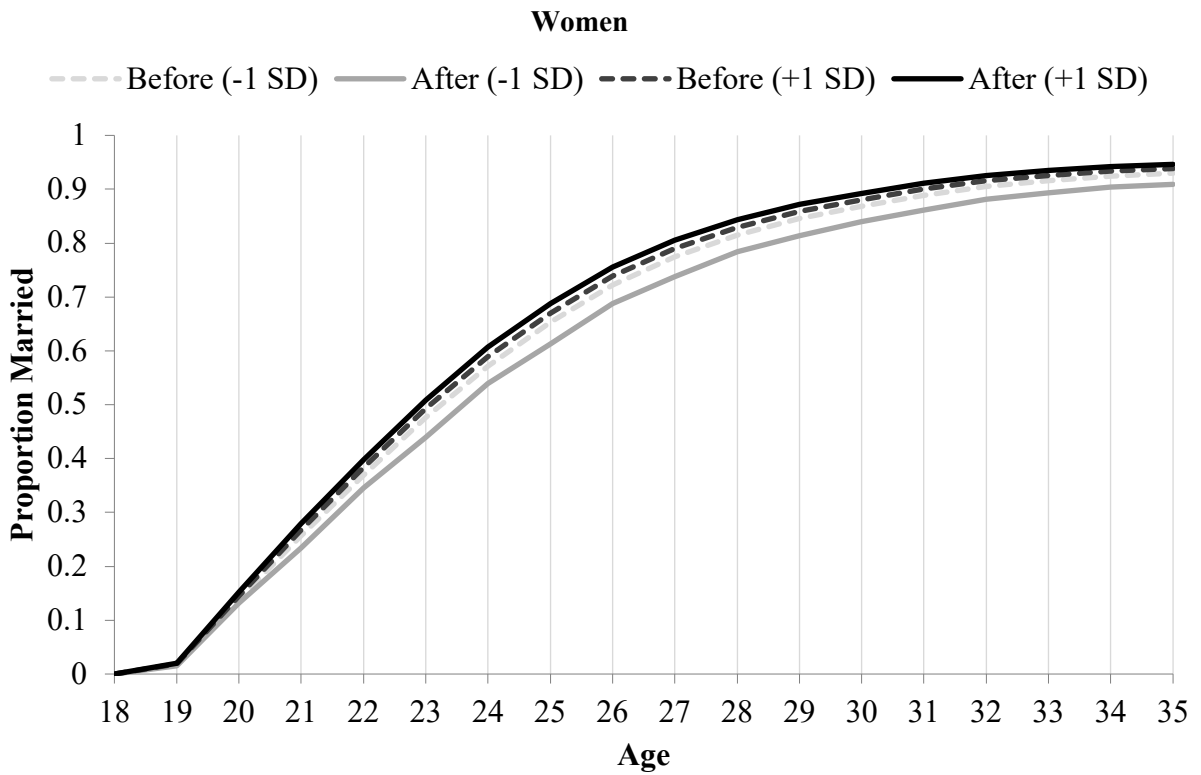
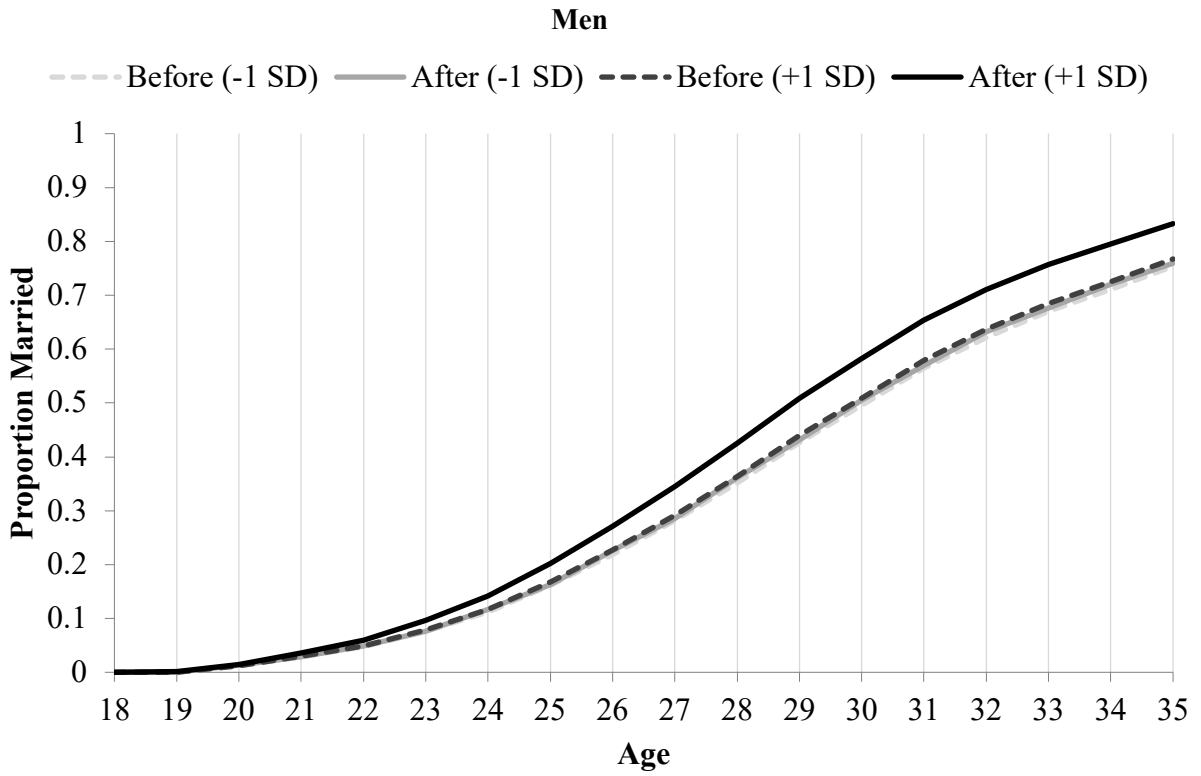


Figure 2. Proportion married at each age simulating variation in the share of “new rent” units in rental housing for those born before 1972 and in 1972 and later, by sex

Source: Based on models presented in Table 5

Table 6. Hazard ratios for all covariates from discrete time proportional hazards model for age at marriage, males ages 15-54, Egypt

	Men	Women
M born 1972 or later or F born 1977 or later	1.078 (0.060)	0.939 (0.043)
Percentage of rental in all housing (SD) * born 1972 (M)/1977 (F) or later	1.104* (0.055)	1.091* (0.042)
Percentage of "new rent" in rental (SD) * born 1972 (M)/1977(F) or later	1.139** (0.048)	1.116** (0.039)
Percentage of "new rent" in rental (SD)	1.020 (0.037)	1.024 (0.034)
Percentage of rental in all housing (SD)	0.914 (0.046)	0.924* (0.036)
Labor market status (private informal omit.)		
Public	1.365*** (0.051)	2.655*** (0.267)
Private formal wage	1.192*** (0.050)	1.307 (0.199)
Non-wage	1.107* (0.045)	2.000*** (0.288)
Unemployed	0.513*** (0.050)	2.241*** (0.254)
OLF	0.305*** (0.020)	2.467*** (0.233)
In school	0.685*** (0.050)	0.194*** (0.009)
Education (none omit.)		
Read & Write	0.879 (0.062)	1.015 (0.065)
Basic	0.825*** (0.041)	1.211*** (0.050)
Secondary	0.722*** (0.033)	1.358*** (0.052)
Post-Secondary	0.721*** (0.046)	0.971 (0.058)
University	0.620*** (0.031)	0.879** (0.038)
Post-Graduate	0.675***	1.738***

	(0.079)	(0.224)
Mother's education (none omit.)		
Reads and writes	0.930 (0.050)	1.141** (0.047)
Basic	0.814** (0.052)	0.890* (0.048)
Secondary	0.927 (0.070)	0.899* (0.048)
Higher education	1.035 (0.115)	0.820* (0.067)
Father's education (none omit.)		
Reads and writes	0.928* (0.034)	0.970 (0.034)
Basic	0.751*** (0.036)	0.835*** (0.036)
Secondary	0.877 (0.062)	0.895* (0.049)
Higher education	0.804** (0.067)	0.799** (0.059)
Father's emp. stat. (public omit.)		
Private wage work	0.948 (0.046)	0.991 (0.042)
Employer	0.985 (0.055)	0.995 (0.048)
Unpaid Family Worker	0.794** (0.059)	0.803*** (0.052)
Missing/Do not know	1.091 (0.278)	0.800 (0.230)
Father's occup. (Manager omit.)		
Armed Forces	1.048 (0.167)	1.331** (0.142)
Professionals	0.898 (0.080)	1.075 (0.076)
Technicians and associate professionals	0.973 (0.073)	1.063 (0.069)
Clerical support workers	0.995 (0.105)	1.051 (0.105)
Service and sales workers	0.930 (0.077)	0.899 (0.060)
Skilled agricultural workers	0.967	0.986

	(0.058)	(0.054)
Craft and related trades workers	0.943	0.926
	(0.072)	(0.057)
Plant and machine operators	0.951	0.968
	(0.068)	(0.072)
Elementary occupations	0.922	1.002
	(0.069)	(0.064)
No. brothers (living and dead)	0.997	1.033***
	(0.007)	(0.008)
No. sisters (living and dead)	1.034***	0.999
	(0.009)	(0.006)
64-Age	0.955**	0.932***
	(0.014)	(0.009)
Square of 64-Age / 100	1.132***	1.150***
	(0.027)	(0.017)
Constant	0.009***	0.075***
	(0.002)	(0.013)
<hr/>		
Age in year included	Yes	Yes
Rural residency and region dummies included	Yes	Yes
N (person-years)	132,717	89,896
N (individuals)	12,702	12,653

Notes: *p<0.05; **p<0.01 ***p<0.001
Standard errors (in parentheses) are clustered at the PSU level.

Table 5. Hazard ratios from discrete time proportional hazards model for age at marriage, by sex, ages 15-54 in 2012, Egypt

	Men	Women
Male born 1972 or later or Female born 1977 or later	1.078 (0.060)	0.939 (0.043)
Percentage of rental in all housing (SD) * born 1972 (M)/1977 (F) or later	1.104* (0.055)	1.091* (0.042)
Percentage of "new rent" in rental (SD) * born 1972 (M)/1977(F) or later	1.139** (0.048)	1.116** (0.039)
Percentage of "new rent" in rental (SD)	1.020 (0.037)	1.024 (0.034)
Percentage of rental in all housing (SD)	0.914 (0.046)	0.924* (0.036)
Controls Included	Yes	Yes
Age in year included	Yes	Yes
Rural residency and region dummies included	Yes	Yes
N (person-years)	132,717	89,896
N (individuals)	12,702	12,653

Notes: *p<0.05; **p<0.01 ***p<0.001

Standard errors (in parentheses) are clustered at the PSU level. Individual and family characteristics included as controls are the individual's labour market status, whether the individual is in school, own and parents' levels of education, father's employment status and occupation, and number of male and female siblings.

Table 4. Housing and marriage cost ratios for men

	Initial housing cost/Monthly wage (In months of wage)	Initial housing cost paid by groom/Monthly wage (In months of wage)	Housing costs/Total cost of marriage (Percentage)	N (observations)
2006	21.8	9.8	23.9	2,989
2012	25.2	10.4	28.5	4,591

Notes: Restricted to men married in the preceding ten years. Spouse reports of marriage costs used for 2006 as men were not asked directly in that year.

Source: Authors' calculations using ELMPS 2006, 2012.

Table 3. Provisions of rental laws in Egypt

	Law 52 of 1969 (and amendments) (“old rent”)	Law 4 of 1996 (“new rent”)
Duration of contracts	Indefinite	Definite
Renewal	Renters have right to remain	Landlords can decide whether or not to offer renewal
Eviction	Renters can only be removed under exceptional circumstances, required court proceedings	Tenants can be evicted without court proceedings
Cost of rent	1969: fixed annual rents in nominal terms at 3% of the land value at the time of construction and 5% of the construction costs 1977: 7% of land values in 1974 and 10% of the construction costs, allowing for 7% inflation 1981: 7% of land and building cost for units built after 1981 using real costs	Landlords can change the rent at their discretion at the end of the contract period (on renewal)
Applicability	Pre-1996, applied to all rentals, post-1996 still applied to rent contracts signed pre-1996	Applied to new rental contracts (and new buildings) 1996 and later

Sources: (McCall 1988a; Middle East Library for Economic Services 2011; Shawkat 2020)

Table 2. Percentage of individuals living with own parents by marital status, age group and urban/rural location in Egypt, 1986, 1996, 2006

	Never married			Currently married			Previously married		
	1986	1996	2006	1986	1996	2006	1986	1996	2006
Males									
Urban									
15-34	87	92	90	16	11	7	47	57	55
35-54	35	60	55	6	5	4	14	20	18
all	85	91	89	9	7	5	24	28	26
Rural									
15-34	89	95	96	35	22	10	50	62	61
35-54	30	63	61	13	10	6	12	21	15
all	87	95	96	23	14	8	26	36	32
All									
15-34	88	94	93	26	18	9	49	59	58
35-54	33	61	57	9	7	5	13	20	17
all	86	93	93	15	11	7	25	31	29
Females									
Urban									
15-34	90	96	93	3	2	2	55	52	55
35-54	29	59	62	1	1	1	9	9	9
all	88	95	92	2	2	1	18	15	16
Rural									
15-34	87	97	97	3	1	1	59	50	53
35-54	24	55	60	1	0	1	9	7	7
all	84	96	96	2	1	1	19	14	14
All									
15-34	89	96	95	3	2	1	57	51	54
35-54	27	57	61	1	1	1	9	8	8
all	86	95	94	2	1	1	18	15	15

Source: Authors' calculations using population census microdata from IPUMS-International

(Minnesota Population Center 2020).

Table 1. Percentage of households with rented housing and percentage of households with nuclear living arrangements in Egypt and comparator countries, by year

Country	Year	Percentage of households with rented housing	Percentage of households with nuclear living arrangements
Egypt	1986	37	83
	1996	27	87
	2006	22	91
Bangladesh	1991	8	61
	2001	10	65
	2011	14	69
Indonesia	1990	8	73
	2000	-	77
	2010	12	75
Iran	2006	22	90
	2011	-	94
Morocco	1994	21	69
	2004	19	71
	2014	19	74
Philippines	1990	9	75
	2000	10	76
	2010	10	73
Turkey	1990	31	77
	2000	24	77

Source: Authors' calculations using population census microdata from IPUMS-International (Minnesota Population Center 2020). "-" denotes not available.