Research Article

**Economic rationales for kin marriage:
Assessing the evidence using Egyptian panel data**

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Contents

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Abstract

BACKGROUND
Although kin marriage is widely practiced in the Middle East, its underlying motivations have not been thoroughly tested.

METHODS
We assess evidence for two economic rationales motivating kin unions using a national sample of Egyptians who wed between the 2006 and 2012 waves of the Egypt Labor Market Panel Surveys. The first rationale for kin marriage involves consolidating family property through the marriage of relatives; the second involves avoiding the costly outlays made when nonrelatives wed.

RESULTS
We find that respondents whose natal households owned agricultural land had higher relative risks of marrying a first cousin, and this relationship is significant for the overall sample and for men. Additionally, we find a positive association between value of natal household agricultural enterprise and marriage to a relative for men only. These findings provide limited evidence supporting the first rationale. For the second rationale, we find that women who wed relatives, reported lower bride's side matrimonial expenditures and lower deferred dower values. However, women who wed first cousins reported higher prompt dower values, indicating mixed support for the second rationale.

CONTRIBUTION
This study uses nationally representative longitudinal data with proper temporal ordering of key variables to statistically test two motivations for kin marriage. This analysis is carried out for Egypt, the most populous country of the world region containing some of the highest rates of kin marriage. Our results call into question two

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common assumptions about the economic rationales motivating kin marriage. We offer explanations for these unexpected findings in our conclusions.

1. Introduction

The Middle East and North Africa (MENA) is exceptional among world regions in its high rates of marriage between close relatives (Reilly 2013). Conjugal unions between cousins and other relatives have historically been the preferred form of marriage across the MENA (Casterline and El-Zeini 2003; Sholkamy 2008). The current prevalence of kin marriages is high but varies across the region. Considering figures from the late 1990s, it appears that the prevalence of consanguineous unions ranges from approximately 21% of all marriages in Lebanon (Jurdi and Saxena 2003) and 23% of all marriages in Turkey (Tabutin et al. 2005), to about 65% of all marriages in Sudan (Jurdi and Saxena 2003) and 66% of all marriages in Palestine (Tabutin et al. 2005).

Scholars of family formation in the MENA report that those who practice kin marriage articulate several rationales for this type of conjugal union. Two of these rationales are based on economic considerations. The first economic rationale involves the desire to consolidate family assets and property through the marriage of kin group members. A second economic consideration that promotes kin marriage has to do with the reduced matrimonial expenditures involved in such unions.

The two rationales for kin marriage have been widely reported by scholars based on their observations of societies where kin endogamy is commonplace. However, most of the evidence underlying these rationales is qualitative, and these rationales have not been tested with representative survey data based on probability samples, with few exceptions (see, for instance, Do, Iyer, and Joshi 2013; Reddy 1988; and Weinreb 2008). Those studies that have used survey data from probability samples suffer from a further problem of inappropriate temporal ordering of variables. Using unique longitudinal and nationally representative survey data from Egypt, the current paper asks (1) are those whose natal households own agricultural land or household enterprises more likely than others to marry within their kin group, and do these relationships differ by gender?; and (2) do those married to members of their kin group report lower matrimonial expenditures compared to those married to nonrelatives, and does this relationship differ by gender?

2. Background

2.1 Defining kin marriage

Many accounts related to the topic of kin marriage investigate consanguinity specifically. While a consanguineous union technically refers to a marriage between biological relatives, it has typically been operationalized to include unions between first or second cousins (Abbasi-Shavazi, Mcdonald, and Hosseini-Chavoshi 2008). Among consanguineous unions in the MENA, marriage to one's patrilateral parallel[3] first cousin holds a special place (Khuri 1970; Sholkamy 2008). These are marriages between the son and daughter of two brothers, or father's brother's daughter/son marriages (FBD/S marriages). In the current study, we are interested in kin endogamy (hereafter, endogamy) more generally; that is, marriage between not only first and second cousins but also more distant kin that may be related to one another biologically or through marriage.

2.2 Correlates of kin marriage in the MENA

The existing literature offers insights into the sociodemographic correlates of kin marriage in the MENA region. Generally, most studies find a negative association between women's education and kin marriage, although some have documented notable exceptions where more educated women have elevated odds of marrying a relative (Abbasi-Shavazi, Mcdonald, and Hosseini-Chavoshi 2008; Bittles 1994; Harkness and Khaled 2014; Weinreb 2008). Kin marriage is usually inversely associated with wealth and is more common in rural areas (Abbasi-Shavazi, Mcdonald, and Hosseini-Chavoshi 2008; Bittles 1994; Harkness and Khaled 2014). In the MENA, kin marriage is practiced among Arab and non-Arab groups alike, as well as among Muslims, Christians, Jews, and Druze (Bittles 1994; Weinreb 2008).

Although the literature on correlates of kin marriage helps answer the question of who practices kin marriage in the region, the literature does not adequately account for why it is practiced. Some scholars have assumed that the practice of kin marriage is driven and maintained by features that characterize societies prior to modernization, specifically, the selection of spouses based on collective rather than individual interests. Indeed, some scholars have tried to explain why kin marriage persists over time in spite

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[3] Patrilateral marriage involves a union with a relative related to one's father, and matrilateral marriage involves a union with a relative through one's mother. Parallel cousin marriages involve unions between two brothers' or two sisters' children, whereas cross cousin marriages involve unions between the children of a brother and sister.

of modernization theory's prediction that it would diminish with 'development.' Modernization theory assumes that as modernization progresses, selection of marriage partners according to individual preferences would replace family selection of mates. This perspective assumes that, if left to make their own choice of marriage partner, male and female marriage candidates will prefer to wed non-kin spouses, whereas marriage partners chosen by family members will tend to be from the kin group. More specifically, Goode (1963; cited in Abbasi-Shavazi, Mcdonald, and Hosseini-Chavoshi 2008) posited that women's increasing education and labor force participation would cause them to demand more input in the mate selection process, leading to reductions in the practice of endogamy.

In fact, observed kin marriage rates have failed to follow the pattern of rapid decline predicted by modernization theorists. A reduction in rates of certain types of consanguineous marriage have been observed in some countries or communities, while in others, researchers have found that consanguineous marriages continue to occur at the same or higher rates, even in settings where women's education and Western cultural norms are widespread (Abbasi-Shavazi, Mcdonald, and Hosseini-Chavoshi 2008; Harkness and Khaled 2014; Weinreb 2008). Although this literature offers insights into how the prevalence in kin unions varies with societal changes longitudinally, we contend that the question of the underlying motivations for the practice of kin marriage has not been adequately addressed by the empirical literature.

2.3 Rationales for kin marriage in the MENA and beyond

A number of rationales for kin marriage can be found in the literature, although they have not been widely tested in observational studies. The first rationale is motivated by an economic consideration related to family-owned assets and property. If the offspring of property-owning siblings marry, inheritance will be concentrated in the hands of the consanguineous couple. This strategy not only prevents the fragmentation of landholdings but also ensures that wealth stays within the family (Bittles 1994; Bittles 2001; Casterline and El-Zeini 2003; Khuri 1970; Reilly 2013; Tabutin et al. 2015; Weinreb 2008). Whether the child of property-owning parents marries a cousin or a more distantly related kin group member, the property-owning parents have a better chance of controlling the disposal of the property than might otherwise be the case (Weinreb 2008). Many researchers emphasize that this motivation for endogamy is salient in the MENA specifically because of Islam's assurance of a share of inheritance for women who survive their property-owning kin (Casterline and El-Zeini 2003; Khuri 1970; Reilly 2013). Although most accounts describe this rationale as applying to land,

wealth, assets, and property, it may apply to family-owned economic enterprises as well.

A second economic consideration related to kin marriage is the reduced matrimonial expenditures involved in such unions (Caldwell, Reddy, and Caldwell 1983; Casterline and El-Zeini 2003; Hoodfar 1997; Reilly 2013; Weinreb 2008). In the MENA region, custom dictates that fewer or less costly marriage assets will be exchanged when relatives wed. Marriage costs include expenditures on jewelry, furniture, appliances, housing, celebrations, and, among Muslims, prompt dower[4] (or *mahr*). While the prompt dower is a sum of money that the Muslim groom or his family is obliged to give to the bride in advance of marriage, the deferred dower[5] (or *muakhar*) is a sum of money promised to the Muslim bride in the event of divorce or the death of the husband, but it is not actually paid unless one of these two events comes to pass. The financial outlays involved in marriage costs are made by the bride and groom and their families and can be quite burdensome (Singerman 2007). When the bride and groom are related, however, existing trust between the families allows them to reduce the financial demands typically expected of each party to the marriage (Reddy 1988; Reilly 2013). Weinreb (2008) adds that prompt dower (*mahr*) as well as deferred dower (*muakhar*) are usually lower in consanguineous marriages for two reasons. First, the prompt dower of an exogamous bride is often higher in order to compensate for her low status as an exogamous bride. The endogamous bride has a lower prompt dower that reflects her status as an already highly valued member of the kin group (Weinreb 2008). Second, the deferred dower is lower for endogamous brides. This is because either the marriage is considered more stable (Hussain 1999; also see Saadat 2015 for evidence from Egypt that consanguineous marriages are less likely to end in divorce[6]) or because it would be easier to extract the deferred dower from a relative (Weinreb 2008).

These two economic rationales for kin marriage have been subjected to limited empirical scrutiny in the MENA and internationally. Using survey data from Egypt, Weinreb (2008) tests the first economic rationale for kin marriage and asks whether women from wealthy families will marry cousins in order to preserve family wealth. He

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[4] In Egypt, the prompt dower consists of a sum of cash that is given by the Muslim groom or his family to the bride before marriage (usually at or after engagement). The Muslim bride typically uses this money to purchase household goods, clothing, and other items for her trousseau (Hoodfar 1997; Salem 2018). Roughly 85%–90% of the population of Egypt is Muslim.

[5] In Egypt and elsewhere, the deferred dower is a sum of money noted in Muslim marriage contracts as an entitlement owed to the wife in case of the husband's death or divorce. Although it is not paid at the time of marriage, its value is the subject of negotiations around the time of marriage (Hoodfar 1997).

[6] Our own data support the assumption that kin marriages are less likely to end in divorce. A cross-tabulation showed that in the full 2012 ELMPS sample and in our analysis sample, a smaller percentage of women whose last marriages were to kin were currently divorced compared to those whose last marriages were to non-kin (this relationship was statistically significant at the $p < .001$ level). The same relationship held for men, but it was not statistically significant.

finds that consanguinity is generally more prevalent among poorer women, "though wealthier than average within their communities" (2008: 204). Do and colleagues (2013) undertake a related analysis using survey data from a rural subdistrict in Bangladesh and demonstrate that the larger a woman's father's landholdings are, the less likely she is to be in a consanguineous marriage. However, they also find that women in consanguineous unions are more likely to receive or expect to receive inheritances or transfers from their parents (Do, Iyer, and Joshi 2013). Although their results are instructive, both studies rely on current measures in the conjugal household as predictors of kin marriage, thus obscuring the direction of causality underlying the relationship between wealth or property and kin marriage, and casting doubt on their findings regarding the first rationale for kin marriage. Specifically, Weinreb employs a wealth variable measured in the conjugal rather than the natal household (2008), while Do, Iyer, and Joshi use a measure of father's current landholdings (2013) rather than landholdings prior to the daughter's marriage. Another limitation of Weinreb's study is that his wealth measure captures household amenities and consumer durables (such as televisions and washing machines) that are not likely to be inherited.

Reddy (1988) and Do, Iyer, and Joshi (2013) ask whether matrimonial expenditures are reduced in consanguineous unions, and thus offer empirical tests of the second economic rationale for kin marriage. Using data from three caste groups in a district in South India, Reddy finds that marriage payments are less common in kin marriages compared to marriages between nonrelatives (1988). Do, Iyer, and Joshi's data from Bangladesh indicate that women in consanguineous marriages are less likely to bring a dowry[7] to their marriages, and that the same women report lower dowry values compared to women who did not wed relatives (2013).

The two economic rationales for kin marriage discussed above do not necessarily share modernization theory's assumption that women are passive actors in the process of union formation under conditions of modest educational attainment and low employment rates among women. Evidence from the MENA suggests that women often favor kin marriage (Sholkamy 2008), seeing it as a means to draw on familial social support and familial economic resources to achieve their personal goals (Hoodfar 1997), and as a way to minimize the risk of abuse at the hands of their husbands (Rugh 1984). This contrasts with much of the rest of the anthropological literature, which has characterized cousin marriage as an exchange of children between male siblings seeking to advance their own interests (Lévi-Strauss 1969). Although the feminist literature often assumes that the family is an unequal institution that subjugates women (Ferree 2010), women may use kin marriage to mitigate the risks and disadvantages inherent to the patriarchal institution of marriage.

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[7] Unlike a dower, which is a transfer from the groom's side to the bride's side, a dowry is a transfer from the bride's side to the groom.

So, for example, the first economic rationale for kin marriage enables women who are customarily denied their share of parental inheritance another route to secure familial resources, through marriage to a relative. Despite Islam's guarantee of (an unequal) inheritance for Muslim daughters, women in a male dominated society may nevertheless find laying claims to their inheritance of familial property and land difficult when competing with male relatives, who also have claims on the inheritance and who are the women's social and economic safety nets in cases of marital conflict, divorce, or widowhood. For this reason, women often forfeit their claims to inheritance rather than risk jeopardizing their relations with male kin (Hoodfar 1997; Hussain 1999; Khuri 1970). By marrying a relative, women may increase their chances of receiving an inheritance, but they may also access familial resources through their husband's inheritance.

The second economic rationale highlights the ways in which brides, grooms, and their families potentially minimize their own financial outlays on marriage through marriage within the kin group. This may be especially salient for poorer families, particularly in settings where access to credit is limited (Do, Iyer, and Joshi 2013). However, reducing their own and their families' outlays on their marriages may come with a tradeoff for women. Some evidence indicates that women in consanguineous marriages are disadvantaged in terms of their status and power within their conjugal households. For instance, one study finds that consanguineous unions are negatively associated with three domains of women's agency using national data from Egypt (Crandall et al. 2016), while another study that uses similar data finds that Egyptian women's family decision making is significantly lower among those who married a cousin, compared to those in non-kin unions (Salem and Shah 2016).[8] If greater access to familial resources in the form of matrimonial expenditures confers greater status or power upon wives (see Salem 2018 for evidence that higher matrimonial expenditures by the bride's side as well as higher deferred dower values are associated with greater decision-making power for wives), this would suggest that women may use kin marriage to secure a share of their family's inheritances but at the cost of reduced power within the conjugal relationship.

2.4 The Egyptian case

As the MENA region's most populous country, Egypt is an important case to examine if we are to arrive at a better understanding of the motivations underlying kin

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[8] This finding appears to be sensitive to context. Using data from the Egyptian governorate of Minya, Yount (2005) finds that the decision-making power of women who were married to blood relatives was no lower than that of women married to nonrelatives.

endogamy. According to the Egypt Demographic and Health Surveys (EDHS), today kin marriage characterizes roughly three in every ten marriages nationally. Among ever-married Egyptian women between the ages of 15 and 49 years, 30 (El-Zanaty and Way 2009) and 32% (Ministry of Health and Population, El-Zanaty and Associates, and ICF International 2015) were currently or most recently married to a relative of some kind in 2008 and 2014, respectively. This overall prevalence represents a drop in kin marriage from a prevalence of 40% of all marriages in 1992 (Weinreb 2008). This drop corresponds with variation in the prevalence of kin marriage by current age, with older women in Egypt generally more likely to report having been related to their husbands before marriage compared to younger women (El-Zanaty and Way 2009; Ministry of Health and Population, El-Zanaty and Associates, and ICF International 2015).

The most recent statistics available for Egypt indicate that first cousin marriages dominate the practice of kin endogamy. In 2014, approximately half of all endogamous marriages were between first cousins (17% of all marriages), about equal percentages of all endogamous marriages were between second cousins (7% of all marriages) or other blood relatives (7% of all marriages), and only 1% were between relatives by marriage (Ministry of Health and Population, El-Zanaty and Associates, and ICF International 2015). As in other settings, in Egypt descriptive statistics indicate that kin marriage is more common among those with modest educational attainment, and among the poorest segments of the population. There is also considerable geographic variation in kin endogamy. Rural areas are characterized by higher rates of kin marriage compared to urban areas, as are Upper (Southern) Egypt and the frontier governorates compared to other regions of the country (El-Zanaty and Way 2009; Ministry of Health and Population, El-Zanaty and Associates, and ICF International 2015).

Egyptian patterns of kin endogamy raise the question of why this type of marriage is not practiced more frequently. The economic rationales for kin marriage would appear to be broadly applicable, and yet in Egypt only a minority of marriages are endogamous, and the proportion marrying endogamously has declined over time. We contend that kin marriage is not practiced more universally because a number of other factors operate to motivate the selection of non-kin as marriage partners, beyond the obvious reality that not all families have assets or property that they wish to preserve through the marriage of cousins. First is the desire to use marriage to solidify economic and political alliances between different families (Tucker 1988). Second is the reality of a finite number of potential marriage partners of the appropriate age and gender in the kin group. This number declines as fertility drops (Barakat and Basten 2014). Finally, some would argue that as the ideal of romantic love as the basis for marriage takes hold, cousins become less likely to marry because feelings of kinship are antithetical to feelings of romantic love (Sholkamy 2008).

2.5 Summary and hypotheses

Although anthropologists have long studied kin marriage in the MENA region, the insights they offer are limited by their small sample sizes and limited geographic scope. At the same time, there is a dearth of generalizable survey research on consanguinity and kin marriage in the region.[9] We underscore three reasons why existing investigations of kin marriage should be extended. First, kin marriage has been shown to have negative effects on infant and child morbidity and mortality in populations where the practice is concentrated across generations (Bittles 2001). Second, kin marriage has potential implications for women's power and status within the family, as noted above (Hoodfar 1997; Reilly 2013; Salem 2018; Sholkamy 2008; Weinreb 2008). Third, scholars need to explore alternative explanations that account for the persistence of kin endogamy in spite of modernization theory's prediction that it would diminish substantially over time (Abbasi-Shavazi, Mcdonald, and Hosseini-Chavoshi 2008).

Although several research agendas may benefit from a better understanding of kin endogamy, many important questions having to do with kin marriage in the MENA region, where it is most widely practiced, remain unexplored. Most importantly, the motivations underlying kin marriage posited by the literature have not, to our knowledge, been systematically and adequately tested with nationally representative survey data. The current paper aims to fill this gap by assessing evidence for the two rationales for kin marriage described above using longitudinal survey data from Egypt containing properly sequenced variables.

Based on the literature discussed above, we structure the analysis that follows according to the following hypotheses:

Hypothesis 1: The consolidating family assets hypothesis: Respondents in kin unions will be more likely than respondents in other unions to report that their natal households owned agricultural land or household enterprises, or that they owned land or enterprises of greater value. In gender-specific analyses, female respondents in kin unions will be more likely than female respondents in other unions to report that their natal households owned agricultural land or household enterprises, or that they owned land or enterprises of greater value, while this relationship will not be significant for male respondents.

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[9] An exception to this is a large literature on the health effects of cousin marriage – see, for instance, Assaf and Khawaja 2009; Barbour and Salameh 2009; Ben Halim et al. 2012, 2016; El-Kheshen and Saadat 2013; Hamamy et al. 2005; Cherkaoui Jaouad et al. 2009; Jurdi and Saxena 2003; Othman and Saadat 2009; Shawky et al. 2011; Sirdah 2014; Sueyoshi and Ohtsuka 2003.

Hypothesis 2: The minimizing matrimonial expenditures hypothesis: Respondents in kin unions will report lower matrimonial expenditures by the bride and her family (henceforth, bride's side), lower matrimonial expenditures by the groom and his family (henceforth, groom's side), as well as lower expenditures on prompt and deferred dowers, compared to respondents in non-kin unions.

3. Data and methods

3.1 Data

In order to assess the rationales for kin marriage summarized in the forgoing discussion, survey data that include variables on the kinship status of spouses before marriage, on the presence and value of household land or a family enterprise in the parental generation, and on the past matrimonial expenditures of brides and grooms are required. These requirements are met by the Egypt Labor Market Panel Survey (ELMPS) 2006 and 2012. This panel dataset is a nationally representative household survey involving face-to-face interviews of individual survey respondents by trained field personnel, who recorded responses using pencil-and-paper questionnaires.

3.2 Sample

Questions related to marriage and family life in the ELMPS 2012 were restricted to ever-married respondents within a specific age range (18–39 years old). The panel ELMPS sample used in our analysis consists of individuals who were interviewed in 2006 and in 2012. The response rate for the 2012 wave of the survey was 77% (Assaad and Krafft 2013). In order to ensure the proper temporal ordering of predictor and outcome variables, we included only those respondents who were never-married in 2006 but who were ever-married in 2012, yielding a sample of 2,798 respondents aged 18–39 in 2012 from 1,890 natal households interviewed in 2006, comprising 331 primary sampling units (PSUs).

3.3 Analyses

We began by running a number of univariate statistics to determine the distribution of our key variables. We next ran a number of multiple regression models to test the research questions laid out above. First, we used logistic regressions with cluster

analysis controlling for sampling weights and variance at the PSU and household level[10] to test the probability of kin marriage according to land and enterprise ownerships of the respondent's natal household in 2006. Multinomial logistic regression was employed because the outcome variable of kin marriage is a three-way categorical variable (see below). While the three responses do represent an ordering of relational proximity, from nonrelative, to non-first cousin relative, to first cousin, ordinal logistic regression would not be appropriate because the proportional odds assumption is violated according to a Brant test (results available upon request). This model tests the consolidating family assets hypothesis. The analysis sample consisted of all respondents who first married between the two waves of the ELMPS survey and were 18–39 years old in 2012. To investigate if gendered patterns would emerge, we split the sample and present regressions for men and women in addition to the overall sample (see Tables 2–6 below).

Second, we regressed matrimonial expenditures on kin marriage with cluster analysis controlling for sampling weights and variance at the PSU and household level. In addressing the minimizing matrimonial expenditures hypothesis, we used linear regression to test the association between kin marriage and logged matrimonial expenditures by the bride's side and by the groom's side, as these outcomes were normally distributed and continuous. Here our analysis sample consisted of the female subset of the larger analysis sample for the models testing bride's side's expenditures, and the male subset for the models testing groom's side expenditures. This was necessary because, besides having married endogamously or not, bride's and groom's characteristics are hypothesized to be important predictors of the matrimonial expenditures they and their families make (see Table 7 below). In the next model testing the minimizing matrimonial expenditures hypothesis, we ran a Tobit regression to test the association between kin marriage and prompt dower on the one hand and kin marriage and deferred dower on the other. Tobit models, which handle data where the outcome variable is censored and its values are partially unknown or missing, were preferred because there were a large number of zeros in the distributions for prompt and deferred dower. The item asking about prompt dower in the ELMPS 2012 questionnaire instructed interviewers to record any value under one Egyptian pound as zero. Many Egyptian Muslim families do not exchange a prompt dower, but in order to meet the Islamic requirement of a prompt dower they use a token dower of 25 Piasters, which is recorded in the marriage contract but not actually exchanged, and which would have been recorded as zero in our data. With regards to the deferred dower, it is also necessary for a valid marriage contract for Muslims, so we treated the zero values as censored. Here the analysis sample consisted of Muslim women who fell within our

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[10] When we control for variation at a higher level of aggregation, we implicitly control for variation at lower levels nested within that higher level as well (see Cameron, Gelbach, and Miller 2006: 3).

larger sample, since only Muslims exchange dowers and since the bride's characteristics are hypothesized to be important determinants of the value of the dowers (see Table 8).

For all analyses, controlling for sampling weights and variance at the PSU and household level was important given the regional and household correlations observed in 2006. Regression without sample weights and clusters would make inappropriate assumptions about the independence of error and variance between data points – specifically, between respondents within the same PSU or siblings from the same household. Using cluster analysis allowed for grouped analysis of error terms, instead of forcing the inappropriate assumption that the shared higher-level effects were independent from one respondent to another within a PSU or household. In other words, for our analyses, only respondents with different PSU and household identifiers were treated as independent.

3.4 Variables

The descriptive statistics for all variables used in this study are featured in Table 1. We include the mean and standard deviations for continuous variables, as well as the sample size (N) and percentages for categorical variables. For all variables, we include year of survey wave. We describe the construction of each of our variables in the following sections.

Table 1: **Sample characteristics of panel respondents (N = 2,798)[a]**

	Survey wave	Mean	SD	Percent	N
Focal variables					
Kin marriage status	2012				
Spouse a nonrelative				73.02	2,043
Spouse a non-first cousin relative				10.76	301
Spouse a first cousin				16.23	454
Natal household land ownership	2006				
No				67.66	1,893
Yes				32.34	905
Natal household land acreage	2006	2.40	5.59		
Natal household enterprise category	2006				
No enterprises				33.81	946
Agricultural only				39.78	1,113
Non-agricultural only				15.69	439
Both				10.72	300
Value of natal household agricultural enterprise[b]	2006	1,209.68	13,015.49		
Value of natal household non-agricultural enterprise[b]	2006				
No enterprise				74.66	2,059
0–174 US dollars				11.29	346
175–1,744 US dollars				8.54	239
1,745–8,721 US dollars				3.86	108
8,722 US dollars or more				1.64	46
Bride's side matrimonial expenditures[c]	2012	2,738.75	2,054.80		
Groom's side matrimonial expenditures[c]	2012	7,393.79	5,447.42		
Prompt dower (*mahr*)[c]	2012	210.95	512.14		
Deferred dower (*muakhar*)[c]	2012	785.06	692.34		
Control variables					
Age at first marriage	2012	26.89	4.53		
Gender	2012				
Male				49.68	1,390
Female				50.32	1,408
Years of education	2012	10.51	4.10		
Religion	2012				
Christian				5.50	154
Muslim				94.50	2,644
Father's education	2012				
Less than secondary				77.81	2,177
Secondary				13.05	365
More than secondary				9.15	256
Natal household wealth score	2006	–0.18	0.94		
Natal household residence	2006				
Rural				56.33	1,576
Urban				43.67	1,222
Natal household region	2006				
Greater Cairo				7.65	214
Alexandria and Suez Canal				7.86	220
Lower Egypt				44.57	1,247
Upper Egypt				39.92	1,117

Note: [a] Sample includes all ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012. [b] Values are in 2006 US dollars. [c] Values are in 2012 US dollars.

3.4.1 Focal kin marriage variable

Kin marriage is the focal variable of this study, utilized as both a hypothesized predictor and outcome of our models. Ever-married respondents interviewed in the ELMPS 2012 were asked whether they were related to their spouses before marriage, with the possibility of reporting that they were maternal or paternal first cousins, blood relatives, relatives through marriage, or unrelated. Using Wald chi^2 tests of linear hypotheses following multinomial logistic regressions, we found that there were no statistically significant differences between kinds of relations when regressed on salient variables. We therefore opted to collapse all first cousin categories to provide more parsimonious analyses. When used as an outcome, kin marriage is measured as a three-way categorical variable (0 = spouse was a nonrelative before marriage or omitted, 1 = spouse was a non-first cousin relative, and 2 = spouse was a first cousin). Thus, only spouses who were first cousins (= 2) are considered separately; all other kinds of relatives (= 1), including relatives by marriage, are collapsed into one category. When used as a predictor variable, a categorical variable compared cousin and other kin marriage to marriage with nonrelatives (the omitted category) (see Table 1).

3.4.2 Hypothesized predictors of kin marriage

The focal predictors of kin marriage explored in this study include reports from the 2006 wave of the Egypt panel survey on household agricultural land and enterprise ownership, followed by questions on the value of total agricultural and non-agricultural enterprise capital for up to four enterprises. Because this is the household in which unmarried respondents lived in 2006, we consider it to be the respondent's natal household. The ELMPS 2006 household questionnaire included a question about the household's ownership of agricultural land. Natal household land ownership is dummy-coded, with no ownership as the omitted category. The area of agricultural land owned was originally measured in *feddan* and *kirat* (a regional system of measuring land area). One *feddan* is equivalent to 24 *kirat* or 1.038 acres of land. The land area was converted to acres to create a variable for natal household land acreage, which is included in our models as a continuous variable (see Table 1).

The 2006 ELMPS also posed a number of questions regarding whether the household owned various types of enterprises, which we used to construct a variable indicating natal household enterprise category, with values including owned no enterprises (= 0, the omitted category), owned an agricultural enterprise only (= 1), owned a non-agricultural enterprise only (= 2), or owned both types of enterprises (= 3). An agricultural enterprise was considered to be present if a member of the natal

household reported ownership (alone or jointly with someone else) of any one of 19 different types of agricultural equipment or any one of 14 different types of livestock. Respondents were also asked about the capital values of the agricultural equipment owned by the household. Capital values were calculated according to the number of each type of equipment (including proportionate shares of those jointly owned with other households) and the average value assigned to the equipment by the respondents. Respondents were also asked about the capital value of the livestock owned by the natal household, which was calculated according to the number of the animals and the value assigned to the animals by the respondents. We assessed the assigned values of both equipment and animals by the corresponding survey questions that asked respondents, "If you sold one of those […] today, how much money could you get for it?" Total value of natal household agricultural enterprise capital thus included the value of equipment and animals owned by the natal household in 2012 US dollars (see Table 1).

In the 2006 ELMPS, respondents were also asked whether the household in which they resided owned a non-agricultural enterprise. Non-agricultural enterprises were measured in a separate questionnaire item asking whether any member of the household "own[s] and work[s] in a non-agricultural project or private activity that aims to produce a service or good for sale." Value of natal household non-agricultural enterprise capital was captured in a survey question asking "What is the estimate of value of the current capital of the [non-agricultural enterprise] economic unit?" The values were recorded as an ordinal variable with seven response ranges in the original dataset; we collapsed the original seven values to four values (converted to 2012 US dollars) and included a fifth value to serve as the omitted category comprised of respondents who reported no household ownership of non-agricultural enterprises (see Table 1).

3.4.3 Hypothesized outcomes of kin marriage

The hypothesized outcomes of kin marriage include the bride's side's logged matrimonial expenditures, followed by the groom's side's logged matrimonial expenditures. Retrospective questions were posed in 2012 pertaining to matrimonial expenditures made around the time of the respondent's marriage. Values were reported in Egyptian pounds and then corrected for inflation and converted to 2012 US dollars. For ever-married respondents, total matrimonial expenditures are calculated as a sum of reported outlays on bridal jewelry (*shabka*), trousseau (*gihaz*), furniture and appliances, housing, and celebrations. Grooms and their families were assumed by the ELMPS survey to be sole contributors to the bridal jewelry. For all other items, respondents were asked to retrospectively report the percentage contribution of brides, brides'

families, grooms, and grooms' families to each component of marriage costs. For our analyses, we lump together the contributions of brides and their families on the one hand and grooms and their families on the other hand to determine how kin marriage is associated with each side's contributions to marriage costs. Our survey data also included measures of the prompt dower paid by Muslim grooms to their brides as well as the deferred dower recorded in the Muslim couples' marriage contracts. Both measures were standardized to 2012 US dollars (see Table 1).

3.4.4 Control variables

The control variables used in our analyses, including values for categorical variables and the year of survey wave, are age at marriage and age at marriage squared[11] (continuous; 2012), gender (male = 0, female = 1; 2012), years of education (continuous; 2012), religion (Christian = 0, Muslim = 1; 2012), father's education (less than secondary = 0, secondary = 1, more than secondary = 2; 2012), natal household wealth score calculated using principal factor analysis based on measures of household amenities and consumer durables[12] (continuous; 2006), natal household residence (rural = 0, urban = 1; 2006), and natal household region (Greater Cairo = 0, Alexandria and Suez Canal = 1, Lower Egypt = 2, Upper Egypt = 3; 2006). These variables are listed in Table 1 above. A number of other control variables were tested but omitted from the final models for various reasons.[13]

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[11] We control for age at marriage rather than current age for a number of reasons. Age at marriage has been found to be younger in kin marriages. In our data, younger men and women appear to be more likely to marry a relative, but this is attributable to selectivity bias. This selectivity bias is due to the fact that those in the lower portion of the age range in 2006 who already married by 2012 might be more likely to marry relatives, and to the fact that older individuals of the analysis sample who would marry a relative were already out of the sample because they married before 2006. The latter type of selection found confirmation in our data: women who married kin were selected out of the analysis sample because of the young age at which they married kin. We partially correct for this by controlling for age at first marriage.

[12] In constructing the wealth variable, the ELMPS team used the first factor only, since it loaded or scored in alignment with the concept of wealth, with almost all assets entering positively, and only a few that signal poverty (like a black and white TV or kerosene cooker) entering negatively. The factor analysis was turned into the predicted value 'wealth' by converting the factor loadings into scoring coefficients with regression scoring, creating 'wealth' out of standardized versions of the underlying variables (Filmer and Pritchett 2001; Schneeweiss and Mathes 1995).

[13] We included birth order in all regressions predicting kin marriage, but birth order did not emerge as a significant predictor of kin marriage in the multiple regression models. Neither did a variable capturing whether the respondent was the first-born male in his family. Similarly, when we used mother's kin marriage status as a predictor of respondents' kin marriage status, it was not significant.

4. Results

4.1 Univariate results

Descriptive statistics summarizing the characteristics of our analysis sample can be found in Table 1. Less than a third (27%) of ELMPS respondents married endogamously, with 16% of all marriages occurring between first cousins. Respondents reported an average of 2 acres of household agricultural land ownership. Though the sample range of acreage was from 0 to 42 (not shown), a majority of respondents (68%) reported no land ownership. Nearly one-third (34%) of respondents reported that their natal households owned neither an agricultural nor a non-agricultural enterprise in 2006. Approximately 11% of respondents reported that their natal households owned both an agricultural and a non-agricultural enterprise in 2006. Half (51%) of respondents reported household ownership of an agricultural enterprise (equipment or livestock) and a quarter (26%) reported household ownership of a non-agricultural enterprise in 2006 (not shown). Natal households' agricultural enterprise capital had a mean value of approximately $1,200 US dollars (in 2012 US dollars). Natal households' non-agricultural enterprise capital modal value was quite modest in value (see Table 1).

The average sum spent by the bride and her family on marital expenses was approximately $2,700 US dollars (in 2012 US dollars), a sum that was dwarfed by that spent by grooms and their families (approximately $7,400[14] in 2012 US dollars). Brides received a mean of about $200 US dollars in prompt dower, and they were promised about $800 in deferred dower on average.

4.2 Multiple regression results

To answer our first research question, we tested respondents' natal family land and enterprise ownership and values (2006) to establish their relationship with eventual marriage to kin (2012). Because the dependent variable is a three-way categorical

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[14] These sums may seem large, but in Egypt, matrimonial outlays are sometimes the biggest intergenerational transfer of wealth that an individual will experience in their lifetime (Singerman and Ibrahim 2003). Other analyses have described the staggering burden of marriage costs for Egyptian youth and their families, estimating that Egyptian brides require about six months of saved wages on average to cover their share of marriage expenditures, whereas grooms require approximately three and a half years of savings on average to cover their share of marriage expenditures (Salem 2016). These gender differences are in line with the fact that grooms assume 39% of marriage costs, grooms' families assume 33%, brides assume 2%, and brides' families assume 26%, according to the 2012 ELMPS data. The component cost to which the highest proportional spending was devoted in 2012 was housing (38% of total marriage expenditures), followed by furniture and appliances (30%) (Salem 2015).

variable, we used multinomial regression, where the base comparison group was comprised of respondents who married nonrelatives. In order to assess gender-specific patterns, we split our sample and present regressions for men and women in addition to the overall sample. Tables 2–6 display the results of these analyses, net of various controls.

Table 2: **Relative risk ratios from multinomial logistic regressions of kin marriage on natal household land ownership using PSU clusters**

	All respondents[a]		Male only[b]		Female only[c]	
	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative
Natal household land ownership	1.292 †	0.996	1.474 *	1.003	1.111	1.010
Age at first marriage	0.619 ***	0.654 **	0.673 †	0.893	0.860	0.559 **
Age at first marriage squared	1.007 **	1.008 **	1.006	1.003	0.999	1.012 **
Female	0.415 ***	0.715 †	–	–	–	–
Years of education	0.989	1.000	0.981	1.018	0.997	0.988
Father's education						
Less than secondary	–	–	–	–	–	–
Secondary	0.645 †	0.986	0.321 **	0.619	1.027	1.500
More than secondary	0.433 **	0.599	0.286 **	0.436 †	0.707	0.844
Natal household wealth score	0.880	0.799 *	0.907	0.835	0.851	0.756 †
Urban natal household	0.878	0.631 *	0.892	0.734	0.900	0.525 *
Natal household region						
Greater Cairo	–	–	–	–	–	–
Alexandria and Suez Canal	1.117	1.052	1.239	0.583	0.853	2.353
Lower Egypt	0.904	0.698	0.779	0.560	1.072	1.034
Upper Egypt	1.493	1.773 †	1.267	1.447	1.808	2.566
Constant	406.527 ***	33.386 *	130.936	0.559	5.959	100.561 †
Number of PSU	331		296		299	

Note: †$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. [a] Sample includes all ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 2,798). [b] Sample includes all female ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,408). [c] Sample includes all male ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,390).

Acreage of agricultural land was not significantly related to marriage to a first cousin or to marriage to a non-first cousin relative in any of the samples.

Our first two regression models tested respondents' probabilities of entering into kin unions based on predictors indicating the presence and acreage of agricultural land owned by the respondents' natal household (Tables 2 and 3). For the full sample of all respondents, natal household land ownership was marginally statistically significant for marriage to a first cousin, but not marriage to a non-first cousin relative, compared to marriage to nonrelatives. Natal household land ownership was associated with a 29% higher relative risk of marrying a first cousin, compared to households that did not own land (RRR = 1.292; p < 0.1). For the male-only sample, this association was stronger in

magnitude and significance. For male respondents, natal household land ownership was associated with a 47% higher relative risk of marrying a first cousin, compared to households that did not own land (RRR = 1.474; p < 0.05). For the female-only sample, the association was not significant.

Table 3: **Relative risk ratios from multinomial logistic regressions of kin marriage on natal family household land acreage using PSU clusters**

	All respondents[a]		Male only[b]		Female only[c]	
	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative
Natal household land acreage	1.005	0.989	1.003	0.980	1.008	1.003
Age at first marriage	0.619 ***	0.654 **	0.675 †	0.897	0.860	0.559 **
Age at first marriage squared	1.007 **	1.008 **	1.006	1.003	0.999	1.012 **
Female	0.413 ***	0.711 *	–	–	–	–
Years of education	0.989	1.000	0.981	1.019	0.997	0.988
Father's education						
Less than secondary	–	–	–	–	–	–
Secondary	0.632 †	0.995	0.315 **	0.631	1.016	1.498
More than secondary	0.432 **	0.604	0.289 **	0.450 †	0.707	0.845
Natal household wealth score	0.886	0.794 *	0.914	0.821	0.854	0.757 †
Urban natal household	0.807	0.611 *	0.768	0.686	0.887	0.527 *
Natal household region						
Greater Cairo	–	–	–	–	–	–
Alexandria and Suez Canal	1.110	1.049	1.224	0.580	0.852	2.354
Lower Egypt	0.925	0.696	0.804	0.555	1.083	1.035
Upper Egypt	1.542	1.783 †	1.345	1.464	1.818	2.563
Constant	451.951 ***	34.295 *	148.261	0.559	6.007	100.109 †
Number of PSU	331		296		299	

Note: †*p* < .10; *p* < .05; **p* < .01; ***p* < .001. [a] Sample includes all ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 2,798). [b] Sample includes all female ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,408). [c] Sample includes all male ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,390).

The next three tables focus on enterprise ownership and value as predictors of respondents' entry into kin unions. Table 4 presents results from our test of household enterprise ownership, with categories of agricultural enterprise only, non-agricultural enterprise only, and both kinds of enterprise, compared to no household enterprise. The relative risks of marrying a relative were not significantly associated with the natal household enterprise categories in any of the samples.

Table 4:   Relative risk ratios from multinomial logistic regressions of kin marriage on natal family household enterprise using PSU clusters

	All respondents[a]		Male only[b]		Female only[c]	
	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative
Natal household enterprise category						
No enterprises	–	–	–	–	–	–
Agriculture only	1.316	1.283	1.488	1.251	1.147	1.368
Non-agriculture only	1.009	0.915	0.939	0.780	1.094	1.133
Both	1.190	1.294	1.238	1.447	1.136	1.164
Age at first marriage	0.616 ***	0.651 **	0.666 †	0.887	0.858	0.554 **
Age at first marriage squared	1.007 **	1.008 **	1.006	1.003	0.999	1.012 **
Female	0.411 ***	0.718 †	–	–	–	–
Years of education	0.990	1.000	0.984	1.020	0.997	0.987
Father's education						
Less than secondary	–	–	–	–	–	–
Secondary	0.649 †	1.008	0.315 **	0.622	1.038	1.561
More than secondary	0.443 **	0.608	0.294 **	0.436 †	0.717	0.877
Natal household wealth score	0.894	0.807 *	0.935	0.839	0.854	0.764 †
Urban natal household	0.893	0.715 †	0.906	0.854	0.906	0.587 †
Natal household region						
Greater Cairo	–	–	–	–	–	–
Alexandria and Suez Canal	1.103	1.047	1.221	0.582	0.846	2.318
Lower Egypt	0.880	0.662	0.749	0.535	1.053	0.985
Upper Egypt	1.454	1.660	1.240	1.360	1.770	2.403
Constant	417.303 ***	30.455 *	145.249	0.529	5.870	92.062 †
Number of PSU	331		296		299	

Note: †*p* < .10; *p < .05; **p < .01; ***p < .001. [a] Sample includes all ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 2,798). [b] Sample includes all female ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,408). [c] Sample includes all male ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,390).

Table 5 presents regressions of marital outcomes on the capital value of agricultural enterprises owned by the natal family. While agricultural enterprise value did not have any bearing on marital outcomes for the overall and female samples, there was a positive and significant association for the male-only sample for marriage to both first cousins (RRR = 1.001; p < 0.05) and non-first cousin relatives (RRR = 1.001; p < 0.05). While the value of agricultural enterprise was a significant predictor of kin marriage for men (p < 0.05), the coefficient suggested a nominal relationship (RRR = 1.001).[15]

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[15] In order to address the possible effect of multicollinearity between urban or rural residence and ownership of agriculture land, we utilized a three-way categorical variable: rural residence without ownership of land or agriculture enterprises (as the reference category), rural residence with ownership of land or agriculture enterprises, and urban residence. None of the categories proved to be statistically significant. Additionally, the mean variance inflation factors (VIFs) for the models including natal household land (1.30) and enterprise category (1.42) with urban/rural residence as a control are lower than the mean VIF for the model that

Table 5: **Relative risk ratios from multinomial logistic regressions of kin marriage on natal family household agricultural enterprise value using PSU clusters**

	All respondents[a]		Male only[b]		Female only[c]	
	First cousin	**Non-first cousin relative**	**First cousin**	**Non-first cousin relative**	**First cousin**	**Non-first cousin relative**
Value of natal household agricultural enterprise	1.001	1.001	1.001*	1.001 *	1.001	0.999
Age at first marriage	0.628***	0.659 **	0.683†	0.895	0.863	0.558**
Age at first marriage squared	1.007**	1.008 **	1.006	1.003	0.999	1.012**
Female	0.414***	0.720 †	–	–	–	–
Years of education	0.989	1.000	0.981	1.018	0.998	0.988
Father's education						
Less than secondary	–	–	–	–	–	–
Secondary	0.644†	0.997	0.329**	0.636	1.021	1.497
More than secondary	0.444**	0.606	0.301**	0.438 †	0.706	0.841
Natal household wealth score	0.870†	0.789 *	0.884	0.813	0.850	0.757†
Urban natal household	0.835	0.658 *	0.829	0.795	0.880	0.520*
Natal household region						
Greater Cairo	–	–	–	–	–	–
Alexandria and Suez Canal	1.106	1.050	1.214	0.581	0.851	2.353
Lower Egypt	0.913	0.689	0.778	0.545	1.079	1.037
Upper Egypt	1.505	1.729 †	1.271	1.374	1.820	2.575
Constant	372.528***	29.063 *	121.394	0.506	5.837	102.871†
Number of PSU		331		296		299

Note: †$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. [a] Sample includes all ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 2,798). [b] Sample includes all female ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,408). [c] Sample includes all male ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,390).

In the final table addressing our first research question, we used categories of the value of non-agricultural enterprise capital to predict kin marriage outcomes. Compared to respondents whose natal families did not own non-agricultural enterprises, those who reported a natal family enterprise value between $1,745–8,721 US dollars were 45% marginally less likely to marry a first cousin (RRR = 0.553; $p < 0.10$) in the full sample. No other category of non-agricultural enterprise value was statistically significant for outcomes of marriage to a first cousin, and none of the categories were statistically significant for marriage to a non-first cousin relative or for the gender-specific models (see Table 6).

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combines the enterprise category measure with urban/rural residence (1.63) (results available upon request). Furthermore, in post-hoc analyses of a regression model testing the statistical effect of our predictors with rural/urban residence included, the VIF of urban/rural residence is a moderate low when included with land ownership (1.44) and enterprise category (1.54) (regressions presented in Tables 3 and 4, respectively).

Table 6: **Relative risk ratios from multinomial logistic regressions of kin marriage on natal family household non-agricultural enterprise value using PSU clusters**

	All respondents[a]		Male only[b]		Female only[c]	
	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative
Value of natal household non-agricultural enterprise						
No enterprise	–	–	–	–	–	–
0–174 US dollars	0.840	1.041	0.629	1.011	1.117	1.100
175–1,744 US dollars	1.228	0.658	1.236	0.694	1.132	0.570
1,745–8,721 US dollars	0.553†	1.212	0.575	1.056	0.482	1.463
8,722 US dollars or more	1.455	0.863	1.566	0.503	1.316	1.280
Age at first marriage	0.619***	0.654 **	0.673†	0.892	0.860	0.560 **
Age at first marriage squared	1.007**	1.008 **	1.006	1.003	0.999	1.012 **
Female	0.410***	0.714 †	–	–	–	–
Years of education	0.988	1.001	0.979	1.018	0.997	0.989
Father's education						
Less than secondary	–	–	–	–	–	–
Secondary	0.625*	0.976	0.307**	0.611	1.020	1.488
More than secondary	0.433**	0.591	0.287**	0.428 †	0.703	0.841
Natal household wealth score	0.883	0.808 *	0.913	0.854	0.858	0.757 †
Urban natal household	0.814	0.623 *	0.783	0.733	0.870	0.509 *
Natal household region						
Greater Cairo	–	–	–	–	–	–
Alexandria and Suez Canal	1.100	1.051	1.203	0.589	0.836	2.386
Lower Egypt	0.953	0.683	0.842	0.560	1.089	1.002
Upper Egypt	1.593	1.741 †	1.418	1.460	1.849	2.503
Constant	467.919***	34.146 *	164.186†	0.578	6.054	98.916 †
Number of PSU	331		296		299	

Note: †*p* < .10; *p* < .05; **p* < .01; ***p* < .001. [a] Sample includes all ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 2,798). [b] Sample includes all female ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,408). [c] Sample includes all male ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,390).

Other variables' associations with kin marriage warrant description, as they confirm some of the patterns noted in previous research on kin endogamy in the MENA but contradict others. Tables 2–6 consistently indicate that respondent age at first marriage was negatively associated with kin marriage statuses ($p < 0.001$), but respondent age at first marriage squared was positively associated with both kin marriage statuses ($p < 0.01$) in the full sample. This indicates a nonlinear pattern such that the youngest- and oldest-marrying respondents were more likely to marry a relative.[16] In the gender-specific samples, this pattern held true only for women

[16] In regressions presented in Tables 2–6, the turning point for age of respondents married to first cousins is 33 while the turning point for age of respondents married to non-first cousin relatives is 25. Results available upon request.

marrying a non-first cousin relative ($p < 0.01$ across Tables 2–6). The variable capturing respondents' own education was not significantly associated with kin marriage across all models. While paternal education levels bore no association with respondents' relative risk of marrying a non-first cousin relative for the overall sample, paternal education was significantly related to relative risk of marrying a first cousin. Those whose fathers had completed secondary ($p < 0.1$) or more education ($p < 0.01$) were significantly less likely to marry first cousins, compared to respondents whose fathers had completed less than secondary education. In the gender-specific regressions, paternal education was significantly related to the relative risk of marrying a relative for men only and was not significantly related to kin marriage for women. Those men whose fathers had completed secondary ($p < 0.01$) or more education ($p < 0.01$) were significantly less likely to marry first cousins, compared to men whose fathers had completed less than secondary education. Those men whose fathers had completed more than secondary education were marginally less likely to marry non-first cousins relatives ($p < 0.1$), compared to men whose fathers had completed less than secondary education. Increased natal family wealth[17] was associated with a lower relative risk of marrying a kin group member across all models, when it proved to be significant. More specifically, greater natal household wealth was consistently associated with a statistically significant reduced relative risk of marrying a non-first cousin relative for the full sample ($p < 0.05$) and also for the female-only sample ($p < 0.1$). Likewise, urban residence of the natal household was associated with a lower relative risk of marrying a relative across all models, when it proved to be significant. More specifically, having an urban natal household was consistently associated with a statistically significant reduced relative risk of marrying a non-first cousin relative for the full sample ($p < 0.05$ or $p < 0.1$) and also for the female-only sample ($p < 0.05$ or $p < 0.1$).

To answer our second research question, we next compared the marriage costs of those who married endogamously to those who did not marry relatives using linear regressions where the outcomes of interest were logged matrimonial expenditures by the bride's side and groom's side for women and men, respectively (see Table 7). The bride's side's matrimonial expenditures were lower amongst those who married first cousins ($\beta = -0.347$; $p < 0.01$) or non-first cousin relatives ($\beta = -0.171$; $p < .05$) compared to nonkin unions. In other words, compared to respondents in non-kin unions, families contributed 29% less towards matrimonial expenditures for women who married a non-first cousin relative and 16% less for women who married a first

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[17] We tested the possibility that kin endogamy may be nonlinearly correlated with natal family wealth. However, when we tested the nonlinearity of the relationship between kin marriage and natal family wealth, we found the relationship to be linear. According to a Wald test, squaring (as well as cubing) wealth did not improve models predicting kin endogamy.

cousin, all else being held equal. The mean value of the bride's side's matrimonial expenditures for women married to nonrelatives was the highest ($2,902 US dollars). In comparison, the bride's side's matrimonial expenditures were lower for women married to first cousins ($2,379 US dollars) and non-first cousin relatives ($2,171 US dollars). To put these figures in context, consider the fact that women in our analysis sample who were working for a wage earned an average of $141 US dollars monthly. The negative associations between kin marriage and the groom's side's matrimonial expenditures were not statistically significant for either category of kin unions.

Table 7: **Beta coefficients from linear regressions of logged matrimonial expenditures (2012 US dollars) on kin marriage using PSU clusters**

	M1. Bride's side's logged matrimonial expenditures[a]		M2. Groom's side's logged matrimonial expenditures[b]	
Kin marriage status				
Spouse a nonrelative	–		–	
Spouse a non-first cousin relative	–0.347	**	–0.052	
Spouse a first cousin	–0.171	*	–0.031	
Years of education	0.062	***	0.038	***
Muslim	0.444	**	0.204	*
Natal household wealth score	0.210	***	0.193	***
Urban natal household	0.083		–0.146	**
Constant	6.619	***	8.159	***
R^2	20.52		14.76	
Number of PSU	299		296	

Note: †$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. [a] Sample includes all female ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,408). [b] Sample includes all male ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,390).

In our final examination of the association between matrimonial expenditures and kin marriage, we regressed prompt and deferred dower values on kin marriage using Tobit regression (see Table 8). Contrary to our expectations, when all else was held equal, prompt dower values were approximately $284 US dollars higher among women who reported having married a first cousin between the survey waves, compared to women who married nonrelatives in the same period (β = 284.003; p < .05). The mean value of prompt dower values for women married to nonrelatives was less ($169 US dollars) than those married to first cousins ($271 US dollars). The mean value of prompt dower values for those who married non-first cousin relatives ($175 US dollars) was also greater than those who married nonrelatives, but this was not significantly different. However, we also found that marrying a first cousin was associated with a $160 US dollars reduction in the value of the deferred dower (β = –159.926; p < .1), while marrying a non-first cousin relative was associated with a reduction of about $225 US dollars (β = –224.915; p < .01). The mean value of the deferred dower for

women married to nonrelatives was the highest ($791 US dollars). In comparison, the mean value of the deferred dower was less for women married to first cousins ($635 US dollars) and non-first cousin relatives ($580 US dollars). These figures are not insubstantial considering, again, that wage-earning women in our analysis sample made an average of $141 US dollars monthly, and wage-earning men made an average of $190 US dollars monthly.

Table 8: **Tobit regressions of 2012 US dollars prompt (*mahr*) and deferred dower (*muakhar*) values on kin marriage using PSU clusters[a]**

	M1. Prompt dower (*mahr*)	M2. Deferred dower (*muakhar*)
Kin marriage status		
Spouse a nonrelative	–	–
Spouse a non-first cousin relative	−52.539	−224.915 **
Spouse a first cousin	284.003 *	−159.926 †
Years of education	−8.215	7.022
Father's education		
Less than secondary	–	–
Secondary	−156.803	197.955 **
More than secondary	337.331 †	446.634 ***
Natal household wealth score	−54.827	66.451 *
Urban natal household	−81.738	20.881
Constant	−526.737 ***	632.498 ***
Number of PSU	296	296

Note: †*p* < .10; *p* < .05; **p* < .01; ***p* < .001. [a] Sample includes all Muslim female ELMPS respondents who were never-married in the 2006 wave, ever-married in the 2012 wave, and between the ages of 18–39 in 2012 (N = 1,327).

5. Discussion and conclusions

The results of our analyses using national survey data from Egypt confirm some findings of the existing literature on kin marriage but complicate other assertions commonly made in previous studies. We found that respondents in kin unions were not characterized by lower educational attainment when all other factors were taken into account, nor were kin unions consistently more common among rural residents. Our findings for the variables education and rural residence may run counter to previous findings because we were able to control for natal family wealth through the use of the panel feature of our data, as well as paternal education. Natal family wealth was negatively associated with kin marriage, with wealthier respondents displaying a significantly lower relative risk of marrying non-first cousin relatives, as we would expect. However, natal family wealth was generally not significantly associated with kin marriage status for those marrying first cousins. Beyond the sociodemographic correlates of kin marriage, our analyses investigated hypotheses related to two

economic rationales for kin marriage. We discuss our results for each of these hypotheses, considering the implications of our findings for existing scholarship on the topic, and conclude with a discussion of the limitations of our analyses.

Our first hypothesis predicted that respondents whose natal household owned agricultural land or family enterprises, or who owned land or enterprises of higher value, would be more likely to marry relatives than respondents whose natal households did not report such resources. The existing literature argues that a key rationale for kin marriage lies in the concern natal families have in preserving family property by ensuring that any inheritance passed on to children stays in the family through children's marriage to kin group members. Furthermore, we hypothesized that when examined separately by gender, women would be more likely to marry kin if their natal families owned land or enterprises, or if the value of land or enterprises was higher. The existing literature contends that women have a higher incentive to marry endogamously because kin marriage offers an indirect way to lay claim on family resources. Our analysis offers a rare empirical investigation of the forgoing claims and indicates that there is only some evidence to support our first hypothesis or the theoretical literature.

Specifically, in regression models testing these association among Egyptians of both genders who married between 2006 and 2012 and were aged 18–39 in 2012, respondents who reported that their natal families owned any agricultural land had higher relative risks of marrying a first cousin, compared to marrying a nonrelative, net of controls (see Table 9). This was also true of the male-only sample, while the association between natal household land ownership and kin endogamy was not significant for the female-only sample. Increases in the acres of land owned by the natal family were not significantly associated with any type of kin endogamy, contrary to Hypothesis 1. Nor was the natal household's ownership of various enterprise categories significantly associated with kin endogamy, contrary to Hypothesis 1. While the presence of an agricultural enterprise in the natal household was not significantly associated with kin unions, the value of the agricultural enterprise was positively and significantly associated with both types of kin marriage for men only. Furthermore, the presence and, for most values, the value of non-agricultural enterprises were not significantly associated with kin unions when other factors were taken into account, contrary to Hypothesis 1. Our findings thus reveal that the consolidating family assets hypothesis was only partially supported for the male-only sample and was supported to an even lesser extent for the overall sample.

Table 9: **Summary of findings for regressions of kin marriage on natal family land and enterprises**

	All respondents		Male only		Female only	
	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative	First cousin	Non-first cousin relative
Natal household land ownership	+ †		+ *			
Natal household land acreage						
Natal household enterprise category						
No enterprises						
Agriculture only						
Non-agriculture only						
Both						
Value of natal household agricultural enterprise			+ *	+ *		
Value of natal household non-agricultural enterprise						
No enterprise						
0–174 US dollars						
175–1,744 US dollars						
1,745–8,721 US dollars	– †					
8,722 US dollars or more						

These results together call into question the commonly held belief that kin endogamy is an economic strategy for consolidating family property or assets, and it can be accounted for in two ways. First, some scholars have argued that although Islam calls for daughters' inheritance rights, in practice, Muslim women in many societies seldom inherit property upon their parents' death. Instead, property is passed on to their male siblings (Casterline and El-Zeini 2003; Hoodfar 1997). As mentioned earlier, some researchers argue that women surrender their inheritance rights in order not to antagonize their brothers, who they depend on for social and material support should they remain unmarried, experience conflict with their husbands, or become widowed or divorced (Hoodfar 1997). If this is the case and kin endogamy does not encourage families to pass on resources to daughters, this may explain the absence of a relationship between most of our measures of property owned in the parental generation on the one hand and kin endogamy in the children's generation on the other hand for the overall sample and the female-only sample. Second, others have pointed out that only families whose property ownership exceeds a certain threshold are concerned with keeping property in the family through children's marriage to a relative (Casterline and El-Zeini 2003; Khuri 1970). If this is limited to very few families, this may similarly account for the fact that we found a somewhat inconsistent association between kin marriage and the presence and value of land and economic enterprises in the natal family.[18]

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[18] We ran interaction terms between natal household wealth in 2006 with the focal predictors in Tables 2–8 but found inconsistent results. Briefly, we found significant interactions between natal household wealth in

The fact that some significant associations did emerge for the male-only sample requires further investigation. Most accounts in the existing literature focus on women's motivations for marrying endogamously, but few attempt to describe the parallel motivations for men. Future research should examine how men view the advantages and disadvantages of kin unions and specifically whether men pursue kin unions as a strategy for consolidating family property, particularly among men whose natal families own land or agricultural enterprises of higher value.

Our second hypothesis posited that respondents in kin unions would report lower matrimonial expenditures compared to respondents in other unions. We found that there was a significant reduction in matrimonial expenditures for the bride and her family in instances where marriage was to any type of relative, compared to instances where marriage was to non-kin, thus lending partial support to Hypothesis 2. Contrary to Hypothesis 2, grooms and their families spent just as much on kin unions compared to non-kin unions. Our results also showed that while deferred dowers were lower among women who married first cousins or other relatives as expected, prompt dowers were not lower but rather higher among women who married first cousins (see Table 10). These findings shed light on a commonly reported rationale for kin unions, namely that they lower the matrimonial expenditures needed to seal a match. Although many ethnographic accounts hold that kin marriages offer brides and grooms the advantage of reduced material expectations and greater affordability in a context of what are often prohibitively high marriage costs, we find only some evidence to confirm this claim. The minimizing matrimonial expenditures hypothesis was supported for the female-only sample alone. Even as the results for the prompt dower outcomes of kin marriage status were contrary to our expectations, they align with economic motivations to minimize matrimonial expenditures: because Egyptian women use their prompt dower to supplement their marital trousseau (Amin and Al-Bassusi 2004), increases in prompt dower would likely mean decreases in the bride's side matrimonial expenditures. The fact that endogamously wed brides and their families spend less on marriage costs and receive lower deferred dowers is also noteworthy because they may compromise wives'

2006 with natal household enterprise category for first cousin kin unions, and with natal household land acreage for non-first cousin kin unions. We found marginally significant interactions between natal household wealth in 2006 with natal household land acreage for first cousin kin unions, and with natal household land ownership for both kin marriage statuses. Natal household wealth did not significantly interact with either value of natal household agricultural or non-agricultural enterprise. For interactions that were significant, those with greater household wealth were more likely to marry endogamously. In terms of wealth interactions for outcomes of kin marriage, we again have mixed findings. We found a significant and positive interaction between natal household wealth in 2006 with non-first cousin kin marital status for bride's side matrimonial expenditures. We found a marginally significant and positive interaction between natal household wealth in 2006 with first cousin kin marital status for prompt dowers. We did not find significant interactions between natal household wealth and kin marriage status for groom's side matrimonial expenditures nor for deferred dowers. Results are available upon request.

status and power within the conjugal union. Salem (2018) shows that the value of matrimonial expenditures by the bride's side along with the value of the deferred dower are positively associated with wives' decision-making power, while the value of the prompt dower is negatively associated with women's decision making. Taken together with the finding that Egyptian women's decision making is reduced in kin unions (Crandall et al. 2016; Salem and Shah 2016), it may be that the matrimonial expenditures are mediating the influence of kin marriage on women's decision-making power within the conjugal union.

Table 10: **Summary of findings for regressions of matrimonial expenditures on kin marriage**

	Bride's side logged matrimonial expenditures	Groom's side logged matrimonial expenditures	Prompt dower (*mahr*)	Deferred dower (*muakhar*)
Kin marriage status				
Spouse a nonrelative				
Spouse a non-first cousin relative	– **			– **
Spouse a first cousin	– *		+ *	– †

There are a number of limitations of the foregoing analyses. The relationships we investigate are necessarily associational and not causal. Although in most cases we have sequenced variables so that they follow the proper temporal ordering, the possibility of spurious or endogenous relationships driving the associations found between predictors and outcomes cannot be ruled out. Subsequent work on this topic should investigate the use of instrumental variables or other approaches to making causal claims.

6. Acknowledgements

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