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WOMEN'S AGE AT FIRST MARRIAGE AND LONG-TERM ECONOMIC EMPOWERMENT IN EGYPT

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Abstract

Sustainable Development Goal (SDG) 5 calls on nations to promote gender equality and to empower women and girls. SDG5 also recognizes the value of women's economic empowerment, entailing equal rights to economic resources and full participation at all levels in economic decisions. Also according to SDG5, eliminating harmful practices—such as child marriage before age 18—is a prerequisite for women's economic empowerment. Using national data for 4,129 married women 15–43 years who took part in the *Egypt Labor Market Panel Survey* (ELMPS 1998–2012), we performed autoregressive, cross-lagged panel analyses to assess whether women's first marriage in adulthood (at 18 years or older, as reported in 2006), was positively associated with their long-term post-marital economic empowerment, measured as their engagement in market work and latent family economic agency in 2012. Women's first marriage in adulthood had positive unadjusted associations with their market work and family economic agency in 2012. These associations persisted after accounting for market work and family economic agency in 2006, pre-marital resources for empowerment, and cumulative fertility. Policies to discourage child marriage may show promise to enhance women's long-term post-marital economic empowerment.

Keywords

age at first marriage; Egypt; economic empowerment; family economic agency; market work; panel analysis

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1. INTRODUCTION

Sustainable Development Goal Five (SDG5) calls on nations to achieve gender equality and to empower women and girls (United Nations General Assembly, 2015). In the social sciences, *women's empowerment* has been defined as the acquisition of *enabling resources* to exercise *agency*, or the ability to make strategic life choices where these choices historically have been limited (Kabeer, 1999). SDG5 recognizes the value of women's *economic empowerment*, entailing "equal rights to economic resources" (Target 5.A) as well as "full and effective participation...at all levels of decision-making in...economic...life" (Target 5.5). The Middle East, compared to other world regions, is notable for women's poor access to market work and low agency in major economic decisions, which are attributed to restrictive gender roles and social expectations for women to prioritize domestic work after marriage (Assaad, Krafft, & Selwaness, 2017).

Embedded in SDG5 also is the notion that eliminating harmful practices in childhood is a prerequisite for women's economic empowerment. *Child marriage*—a formal or customary union before age 18 (Jain & Kurz, 2007)—is one harmful practice identified in SDG5 (United Nations General Assembly, 2015). Although the prevalence of child marriage had declined globally, the practice still affects more than 700 million women worldwide (United Nations Children's Fund, 2014). In the Middle East and North Africa, an average of one in five women 20–24 years was married before the age of 18, and this prevalence varies from between 8% and 32% among countries in the region (ICF International, 2015).

Child marriage may curtail a girl's long-term economic empowerment by disrupting her acquisition of pre-marital enabling resources (United Nations Children's Fund, 2014). Foregone resources may include, for example, lost knowledge and skills from leaving school prematurely (Field & Ambrus, 2008), lost earnings from never entering or from leaving the labor market for marriage (Dahl, 2005), or limited role models and social networks outside the family. Child marriage also may operate by curtailing a girl's emotional and cognitive readiness to negotiate on her own behalf (Dixon Mueller, 2008), including in family economic decisions and in market work after marriage.

Despite the links implicit in SDG5 between child marriage and women's low economic empowerment, researchers have not tested this relationship prospectively. To advance the field, we leveraged data on women's age at first marriage and economic empowerment from the *Egypt Labor Market Panel Survey* (ELMPS 1998ELMPS 2006ELMPS 2012), a 14-year panel study of a nationally representative sample of households in Egypt (Assaad & Roushdy, 2013). The sample for this analysis included 4,129 women ages 15–43 years who were married in 2006 and were still married in 2012. Robust, comparable measures for women's economic empowerment were available across the two waves, including repeated measures for their (1) engagement in *market work* and what we define as (2) *family economic agency* (Crandall, Cheong, & Yount, nd). *Market work* captured formal, waged work as well as part-time, intermittent, home-based, seasonal, and temporary work for some return. *Family economic agency* captured women's influence in family economic decisions, especially in domains historically reserved for men. Until the ELMPS, these aspects of women's economic empowerment were poorly measured in Egypt (Anker & Anker, 1989;

Fargues, 2005; Langsten & Salem, 2008). This analysis, thus, offers new insights about whether postponing first marriage until adulthood may improve a woman's long-term post-marital economic empowerment in a Middle Eastern setting, where men predominate in most sectors of the labor market and remain the titular heads of household (Yount, 2005a, 2005b; Yount, Dijkerman, Zureick-Brown, & VanderEnde, 2014). Compared to women who first married in childhood, we expect that women who first married in adulthood (at 18 years or older), will have higher post-marital economic empowerment in 2012, accounting for their premarital enabling resources for empowerment, short-term post-marital economic empowerment in 2006, and correlated non-empowerment changes in women's cumulative fertility.

2. BACKGROUND

(a) Conceptualizing Women's Economic Empowerment

Women's economic empowerment refers to the process by which a woman's life changes from one in which she has few economic resources and limited economic agency to one in which enhanced resources and economic agency enable her to transform her life (Crandall et al., nd; Kabeer, 1999, 2008; Taylor & Pereznieto, 2014). One necessary (but insufficient) condition for this process includes a woman's acquisition of *human resources*, such as schooling, knowledge, and personal capabilities, including a sense of entitlement, self-esteem, and confidence in her own capacity to transform her life (Kabeer, 1998; Taylor & Pereznieto, 2014). Another condition includes a woman's access to and control over *economic resources*, such as market work and earnings, as well as financial and physical assets (Kabeer, 2008; Taylor & Pereznieto, 2014). A third condition includes the enhancement of a woman's extra-familial *social resources*, including her ability to organize with non-family members to enhance her economic activity and rights (Kabeer, 2011; Kabeer & Huq, 2010). From a life-course perspective, a woman's premarital accumulation of these enabling resources may enhance her post-marital potential to engage in the local economy and to influence family economic decisions, especially in domains once reserved for men (Taylor & Pereznieto, 2014; Yount, VanderEnde, Dodell, & Cheong, 2016).

(b) Levels of and Trends in Women's Economic Empowerment in Egypt

Describing levels of and trends in the economic empowerment of Egyptian—and Arab—women is challenged by inconsistencies in its identified dimensions (Hijab, 1988) and measurement (Anker, 1983; Anker & Anker, 1989; Langsten & Salem, 2008; Papps, 1992). Here, we focus on two dimensions of a woman's economic empowerment, (1) her *participation in market work* and (2) her *family¹ economic agency*. By *market work*, we mean any participation, during a specific period of time, in paid employment or activities in a family business or enterprise, including work on a farm, that sells some or all of its products (Anker, 1983). By *family economic agency*, we mean the degree to which a woman has a say in family decisions involving a financial transaction, especially decisions normally reserved for men (Crandall et al., nd).

¹The Arabic word used in the root for the decision-making questions changed between 2006 and 2012. In 2006, *beit* (house) was used and in 2012, *usra* (household) was used.

In both respects, women's economic empowerment in Egypt has appeared low (Anker & Anker, 1989; Fargues, 2005; Moghadam, 1995). Women's low engagement in market work partly has resulted from poor measurement. The Egypt census and national Demographic and Health Surveys (DHS), for example, have used single keyword questions about *work for cash or kind in the prior week* (Anker, 1983; Anker & Anker, 1989). According to the Egypt census, rates of participation for women six years or older were very low in 1976 (5.5%) and only slightly higher in 1986 (8.9%) (Anker & Anker, 1989). Likewise, estimates from the Egypt DHS have suggested low participation in 1988 (12.7%) and only modestly higher participation in 2003 (21.9%) among ever-married women 15–49 years (El-Zanaty & Way, 2009).

Yet, single keyword questions about market work have not captured the full range of women's engagement, including in home-based, intermittent, part-time, or temporary market work (Anker & Anker, 1989; Donahoe, 1999; Langsten & Salem, 2008). Efforts to capture women's market work more fully have involved the use of probes to ask about specific activities that local women commonly perform to generate income (Anker, 1983; Anker & Anker, 1989; Langsten & Salem, 2008; Yount, Zureick-Brown, & Salem, 2014). Among ever-married women 15–49 years in 2003–4 in Egypt, estimates of market work based on an activities list were more than three times higher than those based on a single keyword question (64.5% versus 21.0%) (Langsten & Salem, 2008). Thus, changes over time in definitions and measurement have complicated our understanding of levels and trends in women's market work in Egypt.

Estimating levels of and trends in women's family economic agency also has been challenged, because comparable items have not (until recently) been asked in repeated cross-sectional or longitudinal surveys. In parts of Egypt, few ever-married women 15–54 years have reported having the final say alone (8.9%) or with others (11.0%) in decisions about the family budget (Yount, 2005b). The ELMPS included in 2006 and 2012 identical measures for women's influence in a range of family economic decisions (Assaad & Roushdy, 2013), offering greater construct validity over time.

(c) Trends in Age at First Marriage and Marital Practices in Egypt

Women's age at first marriage has been on the rise for decades in Egypt; however, child marriage remains a common practice. Between 1947 and 1998, the percentage of women who were never married rose from 59% to 89% among those 15–19 years, and from 20% to 56% among those 20–24 years (Coale, 1988; Rashad & Osman, 2003; U.S. Census Bureau, 2004; United Nations, 1958). Consequently, the median age at first marriage also has risen, from 18.2 years in 1988 to 20.4 in 2008 among women 35–39 years (El-Zanaty & Way, 2009), and was 21.2 years among women 25–29 in 2008 (El-Zanaty & Way, 2009). Despite these increases, 16.6% of women 20–24 years were first married as children in 2008 (El-Zanaty & Way, 2009).

Continuity in other marital practices in Egypt reflects gender norms that challenge women's economic empowerment. First, marriage remains almost universal, with less than 2.0% of women having never married by age 40 (El-Zanaty & Way, 2009). Thus, the choice not to marry remains limited and stigmatized, as never married women continue to be labeled a

bint, or girl (Sadiqi, 2003; Singerman, 2007). Second, *consanguinity*, or marriage to a blood relative, comprises one third of marriages for women in Egypt (El-Zanaty & Way, 2009; Weinreb, 2008). The social networks of women who marry a blood relative tend to be more limited, which in part may relate to more restricted freedom of movement (Weinreb, 2008). Third, women face strong pressures to prove their fertility upon marriage (Inhorn, 1994, 1996), and so few (<1%) use contraception before their first birth (El-Zanaty & Way, 2009). Fertility, thus, is concentrated in women's early reproductive years, with more than one third of total fertility—or 1.1 births—occurring before age 25, and 10% of women having a first birth before age 20 (El-Zanaty & Way, 2009). Together, these practices reflect customary gender norms, which stress women's domestic roles in exchange for economic security from male guardians (Karshenaz & Moghadam, 2001; Moghadam, 2001). Conforming to this sequence of socially expected markers of a 'good woman' carries the promise of enhanced social acceptance and economic security through marriage (Kandiyoti, 1988), but may compete with women's economic empowerment.

(d) First Marriage in Adulthood and Women's Economic Empowerment

Keeping in mind the context of Egypt, we describe here the logic for our hypothesized relationship between delaying a woman's first marriage until adulthood and her post-marital economic empowerment. First, delaying marriage enables women to acquire premarital resources for their economic empowerment. Accounting for these correlated resources should attenuate the relationship between a woman's later first marriage and her post-marital economic empowerment (Lee-Rife, 2010). Second, other expected roles, related to being a wife and mother, may mediate the relationship between a later marriage and post-marital economic empowerment (Assaad, Krafft, et al., 2017). Namely, fulfilling the duties of motherhood for economic security may diminish the association of later marriage with economic empowerment. Third, any adjusted direct association of later first marriage on post-marital economic empowerment may reflect a woman's *intrinsic* human resources for empowerment, or her emotional and cognitive readiness to negotiate economic decisions on her own behalf (Dixon-Mueller, 2008).

(i) Women Who Marry Later Acquire More Premarital Resources for Empowerment—

To elaborate the first point, child marriage, being grounded in patriarchal ideas about family honor and women's respectability (Moghadam, 2003), may constrain the human, economic, and social resources that a woman brings to marriage; whereas, a later age at first marriage coincides with enhanced premarital schooling attainment (Blossfeld & Huinink, 1991; Blossfeld & Jaenichen, 1992; Hango & Le Bourdais, 2007; Hirschman, 1985; Martinez, 2008; Nobles & Buttenheim, 2008; Raz-Yurovich, 2010; Singh & Samara, 1996; Thornton, Axinn, & Teachman, 1995; Yabiku, 2005), experience in market work (Blossfeld & Huinink, 1991; Nobles & Buttenheim, 2008) acquisition of economic assets (Amin & Al-Bassusi, 2004), and potential expansion of a woman's social networks beyond her kin group (Weinreb, 2008). As such, a woman's later age at first marriage should be correlated with the resources for empowerment that she brings to marriage, which themselves should be positively associated with post-marital economic empowerment (Lee-Rife, 2010). Thus, the positive relationship between first marriage in adulthood and post-

marital economic empowerment will be partly attenuated with the inclusion of pre-marital resources for empowerment.

(ii) The Social Role of Wives Diminishes the Empowerment Benefits of Later Marriage—

Second, the gendered division of labor in the household is a longstanding feature of Egyptian, and Middle Eastern, families (Yount, 2005a). The husband is socially expected to be the head of household and the sole or primary breadwinner, providing income and “social protection” for his wife and family. In return, the wife is socially expected to fulfill her role as a mother and homemaker, assuming the domestic and care work for her family (Hoodfar, 1997). As a result, marriage for women often means substantial increases in unpaid labor, which is socially expected to take precedence over engagement in market work (Assaad & El-Hamidi, 2001, 2009; Assaad, Ghazouani, & Krafft, 2017a, 2017b; Assaad, Hendy, & Yassine, 2014; Assaad & Krafft, 2014; Hendy, 2015; Hoodfar, 1997). Thus, marriage at any age in an Egyptian household is likely to be associated with a woman’s diminished engagement in market work, and in tandem, her ability to influence family economic decisions.

(iii) Women Who Marry Later Are Cognitively Ready to Negotiate on their Behalves—

Third, after accounting for premarital empowerment resources, earlier post-marital economic empowerment, and post-marital fertility, we expect that a woman’s first marriage in adulthood will continue to be associated with her long-term post-marital economic empowerment, reflecting other developmental processes. In general, adolescence is a period of rapid developmental change and heightened vulnerability in the transition to adulthood (Patton et al., 2016). Before age 15, girls are not physically or cognitively ready to make safe, consensual, or voluntary decisions about marriage, sexual relations, or reproduction (Dixon Mueller, 2008). In middle adolescence—ages 15 to 17—physical and cognitive readiness still varies widely, depending on the onset and pace of puberty, cognitive maturation, and the risks and responsibilities encountered at marriage and childbearing (Dixon Mueller, 2008). According to Taylor and colleagues (Taylor & Perezniето, 2014), a woman who marries later will have had time to acquire self-esteem, self-efficacy, and a sense of entitlement and rights that enable her to negotiate on her own behalf, for example, in family economic decisions and decisions about market work.

(iv) Empirical Evidence of First Marriage in Adulthood and Economic Empowerment—

Empirically, in Egypt and in other Arab countries, the age at which a woman first marries has been associated with selected measures of her economic empowerment (Al-Qudsi, 1998; Assaad & El-Hamidi, 2001; Crandall, et al., nd; Spierings, Smits, & Verloo, 2010). Based on cross-sectional data from the 2006 ELMPS, women’s mean score for their influence in a range of family decisions was higher among women who married after age 18 years (13.7) than among those who married at 18 years or younger (11.3) (Salem, 2011). For items pertaining to family economic decisions in 2006, the percentage having a say has been higher for women who first married after age 18 years (from 54% to 83% across items) than for women who first married before age 18 (39% to 77% across items) (Crandall, et al., nd). However, using a propensity score covariate adjustment to control for observed behavioral and demographic determinants of age at first

marriage, women's later age at first marriage was positively associated with market work in 2006 but not with family economic agency in 2006 (Crandall et al., nd).

Several shortcomings of prior research are noteworthy. Namely, the available evidence has been limited by (1) a reliance on cross-sectional or retrospective data (Crandall et al., nd; Lee-Rife, 2010; Salem, 2011); (2) a narrow focus on women's formal labor force participation, resulting in poor measurement of women's part-time, temporary, seasonal, intermittent, and home-based market work (Anker & Anker, 1989; Langsten & Salem, 2008); and (3) poor measurement of women's family economic agency (Salem, VanderEnde, Cheong, Miedema, & Yount, under review; Yount, 2005b). Moreover, women's age at first marriage is continuing to increase in a complex environment characterized by persistent social expectations that women will prioritize their duties as wives, mothers, and housewives (Amin & Al-Bassusi, 2004; Eltigani, 2000; Mensch, Ibrahim, Lee, & El-Gibaly, 2003), and economic demands for women to work because of high male unemployment (Moghadam, 2000; Spierings et al., 2010). Such conditions raise questions about the association of a woman's first marriage in adulthood with her long-term post-marital economic empowerment.

(e) Contributions and Hypotheses

Here, we extend this literature, and prior analyses of the 1998–2012 ELMPS, by assessing the associations of women's delayed marriage to adulthood with their long-term post-marital economic empowerment, as measured in 2012. To do so, we (1) use a larger sample of women spanning a wider age range, (2) capture women's long-term post-marital economic empowerment with (a) comprehensive measures of their market work and family economic agency in 2012 and (b) operating as a process through their short-term post-marital economic empowerment in 2006 (Kabeer, 1999), and (3) account for pre-marital resources for empowerment and fertility-related mediators, which may be negatively correlated with the process of economic empowerment. Our focus on Egypt is useful, a setting characterized by historically low but increasing ages at first marriage and modest but increasing, albeit poorly measured, market work and family economic agency among women. Two core hypotheses guide this analysis. First, a woman's first marriage at age 18 or older will have significant, positive associations with her levels of market work and family economic agency in 2012. Second, this relationship will be attenuated only in part with measures for women's pre-marital resources for empowerment, post-marital economic empowerment in 2006, and post-marital fertility.

3. METHOD

(a) Egypt Labor Market Panel Survey (ELMPS)

The Economic Research Forum (ERF) and Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS) jointly carried out the ELMPS (Assaad & Roushdy, 2013). The ELMPS is the most comprehensive source of publicly available micro data on labor-market and human-resource development in Egypt. A nationally representative panel survey, the ELMPS extends beyond the usual focus of such surveys on employment and earnings, covering topics related to parental background, education, housing, access to services,

residential mobility, migration and remittances, time use, patterns and costs of marriage, fertility, women's empowerment, job dynamics, savings and borrowing behavior, and the operation of household enterprises and farms. The ELMPS panel design permits the study of various phenomena over time, and includes many retrospective questions about the timing of major life events related to schooling, residential mobility, jobs, marriage, and fertility.

(b) ELMPS Panel Design and Sample for Analysis

The first round of the ELMPS, the 1998 Egypt Labor Market Survey (ELMS 1998), was conducted in a national² sample of 4,816 households with 23,997 members (Assaad & Roushdy, 2013). Sampling followed a stratified, two-stage design, in which 200 primary sampling units (PSUs) were selected from a master sample with probability proportional to size (PPS) and oversampling in urban areas. The 2006 ELMPS located 3,685 households from the 1998 ELMS, added 2,168 households that had split from the 1998 households, and added a refresher sample of 2,498 households from 100 randomly selected PSUs, for a total of 8,351 households with 37,140 members (Assaad & Roushdy, 2013). The 2012 ELMPS tracked the households and individuals interviewed in 2006 and added a refresher sample of 2,000 new households from another 200 randomly selected PSUs to ensure national representation, for a total sample of 12,060 households and 49,186 members (Assaad & Roushdy, 2013). By design, the 2012 refresher sample over-sampled in high-migration areas.

The eligible sample for the present analysis included 4,129 women 15–43 years who were married in 2006 and were still married in 2012. Nine respondents lacked data on location of birth, one on respondent's employment status before age 16 years, five on mother's employment, six on mother's literacy, eight on father's literacy, two on respondent's completion of primary schooling, and four on the number of living siblings. Thus, using listwise deletion for 2006 empowerment items and covariates, the sample size with complete data for our final models was 4,108 women.

(c) Data

(i) Overview of ELMPS Data across Waves—The 1998, 2006, and 2012 waves of the ELMPS included three questionnaires: (1) a household questionnaire administered to the head of household or the head's spouse, with questions about basic demographic attributes of all members, ownership of durable goods and assets, and housing conditions, services, and facilities; (2) an individual questionnaire administered to every person in the household age six or older; and (3) a household enterprise and income module. The questionnaires were similar across survey waves to ensure data comparability over time, but modules and questions were added to each wave. The 1998 ELMPS and subsequent surveys collected data on parents' attributes as well as respondents' schooling, employment and unemployment, job characteristics, job mobility, geographic mobility, and earnings. The 2006 ELMPS added modules on siblings' attributes, fertility, the costs of marriage, a more detailed schooling history, attributes of the first job, women's empowerment, and new questions to capture employment. The 2012 ELMPS added modules on health, return

²The panel survey does not cover the five border governorates, remote and sparsely populated governorates containing at most 2% of the population in 2006 (Minnesota Population Center 2011).

migration, information technology, and savings and borrowing; a life-events calendar, tracking education, marriage, work, and migration over time; and an extended module on women's employment, with new questions on prior and current wage workers, first jobs, and job changes since the revolution.

(ii) Outcome Measures of Women's Economic Empowerment

Women's Market Work: The ELMPS used a novel approach to capture women's participation in market work, including their *waged employment* as well as their *engagement in fulltime or part time, and seasonal/intermittent or permanent activities for the purpose of sales, marketing, or helping in a family business* (Assaad, 2009). At each round, women were asked whether they had taken part in the prior seven days and prior 30 days in *any employment*. Those who answered "no" were asked if they had taken part in any of 13 activities for the same purposes. The activities list captured tasks that women often perform but may overlook when responding to single-keyword questions about women's employment.³ From the 14 items administered in 2006 and 2012, we created two measures for whether a woman engaged in market work in the prior 30 days in 2006 and 2012. The measure in 2006 captured short-term post-marital market work, and the measure in 2012 captured long-term post-marital market work, as elements of women's short-term and long-term economic empowerment.

Women's Family Economic Agency: We created a measure for women's influence in family economic decisions based on their responses to four questions, including (1) *making large household purchases*, (2) *making household purchases for daily needs*, (3) *getting medical treatment for herself*, and (4) *buying clothes for herself*. The responses were coded as binary (0 = has no say, 1 = has sole or joint say). We collapsed the two response options indicating women's sole or joint say in family economic decisions because these two categories do not reflect clear differences in the level of economic empowerment. For example, women having a joint say in household purchases for daily needs may reflect a more equitable division of household responsibilities, whereas women having the sole say in household purchases may have less support from their spouse in these household responsibilities. Given the survey design and the dichotomous measurement scales for these items, we estimated tetrachoric correlations, which reflect the level of bivariate association between any two unobserved or latent continuous indicator variables that underlie two observed or manifest indicator variables (Brown, 2014; Muthén, 1983).⁴ We then used the weighted tetrachoric correlation matrix in a factor analysis of these items following our prior work (Crandall et al., nd). The measure in 2012 captured long-term post-marital family economic agency, and the measure in 2006 captured short-term post-marital family economic agency.⁵

³These were (1) agricultural work; (2) raising poultry/livestock; (3) producing ghee/cheese/butter; (4) collecting fuel/wood-cutting; (5) preparing food; (6) sewing/embroidery/crocheting; (7) producing straw products/carpets/textile/ropes; (8) offering services for others in a house, shop, or hotel; (9) independent paid work; (10) selling goods in the market/the street/at home; (11) buying goods and reselling it; (12) helping in construction work; and (13) learning a skill.

⁴In this framework, a latent continuous response variable, denoted by i^* , reflects the amount of an attribute of family's influence in family economic decision or family's economic agency that is required to provide a response of 1 indicating sole or joint say on the decisions about household purchases, social visits, food for daily needs, medical issues, and shopping for clothes (Brown, 2014)

⁵In our prior work, we tested and found evidence to support the assertion that this scale is a valid measure of the same underlying family economic agency construct over time; thus, any changes detected across the two waves may be interpreted without ambiguity

(iii) Explanatory Measure of Women’s First Marriage in Adulthood—We used information from the 2006 ELMPS marital history to measure women’s age at first marriage in adulthood (1=18 years or older) versus in childhood (0=less than 18 years, the reference group). We used the cutoff of age 18, as this is the standard definition for marriage in childhood versus adulthood (Jain & Kurz, 2007). Eighteen also is the age at which women typically complete secondary school in Egypt, so this cutoff also is contextually relevant.

(iv) Control Variables

Premarital Resources for Empowerment: We included several variables to account for premarital resources for empowerment that may jointly influence a woman’s first marriage in adulthood and her long-term post-marital economic empowerment (Crandall et al., nd; Crandall, VanderEnde, Cheong, & Yount, 2016). Each variable was hypothesized to be associated with women’s market work or family economic agency in 2006 (Crandall et al., nd). Two of these covariates included the respondent’s age in years and number of living siblings.. Number of living siblings captured potential resource constraints in childhood. Six other binary variables (yes=1; no=0) captured resources of the respondent’s parents (mother was literate, father was literate, mother was employed at respondent’s age 15) and of the respondent (born in an urban area, completed primary school, and was economically active before age 16). All eight covariates were measured in 2006.

Cumulative Fertility: Lastly, a measure of women’s cumulative fertility in 2012 was included to capture important social expectations of married women that may be negatively correlated with their short-term (2006) and long-term (2012) market work and family economic agency (Assaad, Krafft, et al., 2017). To avoid multi-collinearity with other included variables, women’s cumulative fertility was dichotomized at the median of three live births (0 denoting ≤ 2 live births, 1 denoting > 3 live births).

(d) Analysis

We first conducted univariate analysis to assess the completeness and distributions of all variables and estimated bivariate associations of all variables. We then estimated a series of four structural equation models to test our hypotheses (Figure 1). In general, structural equation modeling is a useful approach when the researcher is interested in testing theory about the relationships among observed variables and latent factors (Bollen, 1989). In our case, we were interested to understand the relationship of women’s (observed) marriage in adulthood with their (observed) market work and (latent) family economic agency, measured with women’s responses to items about their say in four family economic decisions. Model 1

as meaningful changes in the construct (Cheong, Yount, & Crandall, 2017). For this analysis, we also tested whether the family-economic-agency items functioned equivalently or differentially across the two age-at-first-marriage groups. An item displays differential item functioning (DIF) when its expected score is unequal across the two groups, conditioning on their latent trait, of family economic agency. This analysis was designed to ensure that any observed differences in family economic agency between the two age-at-marriage groups were not attributable to DIF, or to differences in the measurement properties of the scale. Specifically, we used a multiple indicator multiple cause (MIMIC) model (Jöreskog & Goldberger, 1975) to evaluate measurement invariance of the agency measure across the two age-at-first marriage groups. In the MIMIC model, (a) the latent family economy agency construct, and (b) the four manifest indicators for decisions about household purchases, social visits, food for daily needs, medical issues, and shopping for clothes were both regressed onto age-at-first-marriage membership. A significant direct effect of the membership covariate on an indicator would be evidence of measurement non-invariance for that specific indicator. No such effect was detected in our analysis (Brown, 2014).

estimated the associations between age at first marriage and market work and family economic agency in 2012, unadjusted for the effects of the economic dimensions in 2006. Model 2 allowed for autoregressive and cross-lagged pathways (Mayer, 1986; Selig & Little, 2012) to capture relations among the measures for economic empowerment over time. Estimating *autoregressive effects* allowed us to model the association of the same dimension of economic empowerment measured on different occasions (e.g., market work in 2006 with market work in 2012), and estimating *cross-lagged effects* allowed us to model the association of one dimension of economic empowerment in 2006 (e.g., market work) with the other dimension in 2012 (e.g., family economic agency), and vice versus (Selig & Little, 2012). This approach allowed us to control for past levels of these dimensions (also called “stability effects”) while studying the associations between age at first marriage with the dimension outcomes in 2012 (Adachi & Willoughby, 2015). Next, we tested for any significant differences between the two age-at-first-marriage groups in measures for market work and family economic-agency in 2012, adjusting for the associations of participants’ pre-marital resources with the two economic dimensions in 2006 and 2012, while estimating the temporal relationships between the 2006 and 2012 economic dimensions (Model 3). Finally, we included cumulative fertility up to 2012 as an additional control (Model 4).

All analyses were performed with Mplus 7.0 (Muthén & Muthén, 1998–2012) using mean- and variance-adjusted weighted least squares (WLSMV) estimation, a suitable approach when models are estimated using ordinal data. We used panel weights to account for the complex sampling design and attrition (Assaad & Roushdy, 2013). Results that were significant at the $p < .05$ level are discussed.

4. RESULTS

(a) Characteristics of the Sample

In 2006, women respondents were 30.2 years old, on average (Table 1). Compared to women first married as children, those first married as adults had substantially more premarital resources for empowerment. Specifically, compared to their counterparts, women married as adults more often had been born in an urban area (42.4% versus 19.3%), had fewer living siblings (mean 4.8 versus 5.3), had a literate father (49.7% vs 29.0%), had a literate mother (21.4% versus 7.6%), had a mother engaged in market work when the respondent was age 15 (6.8% versus 6.3%), and had completed primary school themselves (69.4% versus 31.8%). Compared to their counterparts, women first married as adults less often reported being economically active before age 16 years (5.3% versus 14.2%).

On average, women had first married at age 20.2 years (Table 1), and this average was more than five years higher among women married as adults (21.6 years) than among women married as children (16.0 years). Overall, a substantial minority of women were engaged in market work in 2006 (23.9%) and in 2012 (21.1%). A majority (68.4%) did not perform market work in either year. In 2006, women who first married as children were performing market work more often than women who first married as adults; whereas, in 2012, the opposite pattern was observed.

Finally, the percentages of women who reported having a say in each of the four family economic decisions were higher in 2012 than in 2006 and were consistently higher among women marrying as adults than among women marrying as children (Table 1). In general, women's participation in decisions about large purchases, typically the domain of men, was less common in both years than women's participation in decisions about the purchase of household items, clothes, and medical care.

(b) Autoregressive Cross-Lagged Model Results

The results for the sequence of four structural equation models we estimated are shown in Table 2. In baseline Model 1, with dichotomous age at first marriage and no controls, women's first marriage in adulthood was positively associated with their market work in 2012 ($\gamma = 0.07$, $SE = 0.04$, $p < .100$) and family economic agency in 2012 ($\gamma = 0.30$, $SE = 0.07$). After adding measures-women's market work and family economic agency in 2006 (Model 2), the direct relationships of marriage in adulthood with market work and family economic in 2012 were significant ($\gamma = 0.07$, $SE = 0.02$ and $\gamma = 0.17$, $SE = 0.03$, respectively). Regarding the autoregressive and cross-lagged associations among empowerment measures in Model 2, women's market work and family economic agency in 2006 were positively associated with women's market work in 2012 ($\gamma = 0.46$, $SE = 0.02$; $\gamma = 0.06$, $SE = 0.01$, respectively), and women's family economic agency in 2006 was positively associated with their family economic agency in 2012 ($\gamma = 0.27$, $SE = 0.03$); however, women's market work in 2006 was not associated with women's family economic agency in 2012. Women's market work and family economic agency were positively correlated in 2012 (coefficient of correlation = 0.02, $SE = 0.01$).

In Model 3, we added premarital resources for empowerment as controls, and the results were substantively similar to those in Model 2. Namely, women's marriage in adulthood remained positively associated with their market work and family economic agency in 2012 ($\gamma = 0.19$, $SE = 0.07$; $\gamma = 0.09$, $SE = 0.05$; Root-mean-square Error of Approximation (RMSEA) = 0.03, Tucker-Lewis Index (TLI) = 0.92, Model 3). According to Brown (2006), the RMSEA is an index that evaluates the degree to which the hypothesized model fits reasonably well in the population. The TLI is another model fit index that takes the model complexity into account by adding a penalty for additional parameters. The general benchmarks for good fit are an RMSEA close to 0.060 or less and a TLI close to 0.950 or greater. The fit of the model, thus, was adequate. In Model 4, in which cumulative fertility was added as a control, women's first marriage in adulthood remained positively associated with their market work and family economic agency in 2012 ($\gamma = 0.20$, $SE = 0.07$; $\gamma = 0.09$, $SE = 0.05$), and model fit was adequate (RMSEA = 0.03, TLI = 0.90). In terms of effect sizes, all else being equal, the later married group had, on average, a 0.07 and a 0.05 standard deviation unit higher in their market work and family economic agency in 2012. According to the benchmark suggested by Adachi and Willoughby (2015) in assessing longitudinal effects in autoregressive model (small = .05), these effects could be considered small but meaningful.

5. DISCUSSION

The United Nations SDG5 has identified child marriage as a harmful practice to be eliminated as a means to advance gender equality and to empower women and girls (United Nations General Assembly, 2015). Despite global declines in child marriage, the practice remains prevalent in Africa, Asia, and parts of the Middle East (United Nations Children's Fund, 2014). This analysis is the first to assess, using prospective longitudinal data from Egypt, whether delaying women's first marriage to adulthood is associated with her long-term post-marital economic empowerment. Our analysis leveraged data from the 2006 and 2012 waves of the Egypt Labor Market Panel Survey, which collected robust, repeated measures for women's participation in market work, family economic agency, and important potential confounders. These unique panel data enabled us to establish an appropriate temporal ordering between our explanatory variable of main interest (first marriage in adulthood) and our outcomes of main interest, market work and family economic agency in 2012. We also employed a novel analytic strategy that leveraged a two-wave autoregressive, cross-lagged panel approach. This analysis is among the first to use panel data to operationalize the idea that women's empowerment is a process that unfolds over the life course (Kabear, 1999; Malhotra & Schuler, 2005). This approach also permitted us to estimate the direct associations of first marriage in adulthood with two dimensions of women's long-term economic empowerment, accounting for the autoregressive and cross-lagged associations of measures for economic empowerment in 2006 and 2012, women's premarital resources for empowerment, and women's cumulative fertility. Assessing these relationships in Egypt is especially important, given the persistence of child marriage and the low economic empowerment of women in the Middle East, relative to other regions.

Overall, the findings from this analysis support our initial hypotheses. In descriptive bivariate analyses, women's first marriage in adulthood was associated with higher levels of participation in market work in 2012 and higher levels of family economic agency in 2006 and 2012 for all component items. In unadjusted panel analyses, women's first marriage in adulthood was positively associated with their engagement in market work and their family economic agency in 2012. In models that adjusted incrementally for any autoregressive and cross-lagged effects of economic empowerment in 2006, plus women's premarital resources for empowerment, plus women's cumulative fertility up to 2012, women's first marriage in adulthood retained a direct, positive association with their engagement in market work and family economic agency in 2012, although the latter association was slightly attenuated in the models that controlled for women's premarital resources for empowerment. Overall, these findings provide reasonably strong support for the general idea that delaying women's first marriage until adulthood is a potentially important, earlier life course determinant of multiple dimensions of women's long-term post-marital economic empowerment.

Some discussion about the mechanisms by which this relationship may operate is worthwhile. Specifically, we adjusted for women's parental human and economic resources (e.g., maternal and paternal literacy; maternal work); women's own premarital human and economic resources for empowerment (e.g., schooling attainment and market work); and important life course events, such as childbearing, which in Egypt, may enhance a woman's social value while diminishing her prospects for market work. Thus, other unmeasured

pathways may account for the persistent association of women's later first marriage and their long-term economic empowerment. These pathways may include other "intrinsic" human resources for empowerment, such as normal developmental processes related to physical and cognitive maturation, which enable girls to make "safe, informed, and voluntary" decisions with respect to marital, sexual, and reproductive transitions (Dixon-Mueller, 2008). Moreover, these pathways may include other, accumulated life experiences, which result in more knowledge about their rights as women and wives, higher self-esteem from accrued personal accomplishments, and greater confidence in their ability to achieve their goals and aspirations (Santhya et al., 2010; Taylor & Pereznieta, 2014). The significant association of women's first marriage in adulthood with their family economic agency in 2006 and 2012 but with their market work only in 2012 is consistent with this interpretation. Women's say in family economic decisions may be correlated with their more general self-efficacy and self-esteem and ultimately contribute to their long-term participation in market work. On the other hand, participating in market work alone, for example, without control over one's own earnings, may not enhance self-esteem, self-efficacy, or confidence about life goals, and thus may not enable women to negotiate on their own behalves.

In light of this interpretation, some limitations of the analysis are noteworthy. First, we were able to analyze women's market work only as a manifest variable, rather than as a latent variable, because only women who answered "no" to the initial question about market work in the past 30 days were probed about specific market-work activities. Still, the multi-question format did capture more women who engaged in market work because we did not have to rely on a single keyword question. Second, the syntax of the "stem" for the family economic agency items was based only on family members living in the same household and did not include "quasi-co-resident" family members, who often live in the same building or neighborhood (Yount, 2005a). Family members living nearby may strongly influence family economic decisions, but these potential influences were not captured in the wording of the ELMPS items. Third, we were able to employ repeated measures of women's economic empowerment only over two waves—in 2006 and 2012—because not all of the relevant questions were asked in the 1998 wave. Our inclusion of younger and older married women, however, mitigates somewhat the limitations of a six-year follow-up. Fourth, our modeling strategy does not allow for an assessment of within-person change in women's economic empowerment. In other analyses (available on request), we did estimate a latent-change-score model with the latent family economic decisions only, but poor model fit prevented us from using this analytic approach. Future analyses of panel data on women's empowerment should consider this estimation strategy to assess within-woman changes in economic empowerment. Fifth, our modeling strategy did not account for the potential endogeneity of women's age at first marriage, so we have interpreted our findings as associational and not causal. An instrumental variables approach using marriage laws has been applied in the U.S. to account for the endogeneity of marriage timing; however, the lack of state-level variation in marriage-timing laws in Egypt precludes this approach for our purposes. Results from similar analyses in the U.S. have shown, in that context, that non-IV approaches have *underestimated* the impact of early marriage on other transitions to adulthood (Dahl, 2005). Finally, the ELMPS did not measure the other human resources discussed above that may mediate the influence of women's marriage in adulthood on their economic empowerment.

In future data collections, interdisciplinary teams that include experts in adolescent development would expand an understanding of the physical-, cognitive-, and identity-related development processes at different waves that mediate the relationship of later marriage and economic empowerment, shown here. Collecting these mediators should be an integral part of the study design (Hogan & Lancaster, 2004).

Despite these caveats, the many substantial strengths of this analysis are noteworthy. First, the analysis was undertaken in a historically gender-inequitable setting, where child marriage remains prevalent (Tabutin & Schoumaker, 2005) and where women have low economic empowerment in public and private life (Fargues, 2005). Second, the analysis relied on a nationally representative panel of women with repeated measures for the variables of theoretical interest (Assaad & Roushdy, 2013), and evidence of measurement invariance for the family economic agency items, across groups (see note 6) and over time (Cheong, Yount, & Crandall, 2017), strengthening our interpretations of changes in empowerment. Third, our modeling strategy—using an autoregressive, cross-lagged panel analysis—allowed us to assess the relationship of women’s first marriage in adulthood with women’s long-term economic empowerment, accounting for prior levels of empowerment (Selig & Little, 2012). This modeling strategy also aligned with theories of women’s empowerment, which view it as a dynamic, life-course process (Kabeer, 1999; Lee-Rife, 2010; Malhotra & Schuler, 2005). Finally, to our knowledge, this study is the first longitudinal analysis to suggest that delaying a woman’s first marriage until adulthood may enhance her long-term economic empowerment. For all of these reasons, the study advances knowledge regarding the implications of child marriage for women’s long-term post-marital economic empowerment.

This analysis should be replicated in other Middle Eastern and non-Middle Eastern settings where rich, longitudinal data are available and a similarly rigorous analysis can be undertaken. Future longitudinal research also may explore whether women’s later age at first marriage is associated with other dimensions of their post-marital empowerment, such as their freedom of movement, attitudes about gender, and control over economic resources. Finally, other panel studies should consider including the full range of post-marital human resources that may mediate the relationship of later first marriage and post-marital economic empowerment, to elucidate the nature of this relationship.

Overall, the findings from this analysis offer important insights for social policy. Most notably, social policies and interventions that are designed to prevent child marriage may have cascading, long-term benefits for women’s post-marital economic empowerment. A recent review of the intervention literature suggests that the evidence from randomized controlled trials is thin; however, an array of cash-transfers, livelihoods, and ideational interventions may be effective to delay first marriage (Malhotra, Warner, McGonagle, & Lee-Rife, 2011), and subsequent relationships with women’s economic empowerment warrant study. Comparative randomized controlled intervention trials embedded in the sustained follow-up of unmarried program and non-program beneficiaries, and with time-invariant and time-varying confounding data collected, is a compelling approach to test for causal impacts and to inform social policy, especially where women’s marriage in childhood persists and their economic empowerment has yet to be realized.

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Child marriage, before age 18, may restrict women's economic empowerment.

The Middle East is known for women's low economic empowerment.

Rigorous panel data analysis of age at marriage and economic empowerment is needed.

As we show, marriage after 18 y in Egypt is related to long-term economic empowerment.

Social policies to reduce child marriage may empower women in the long-run.

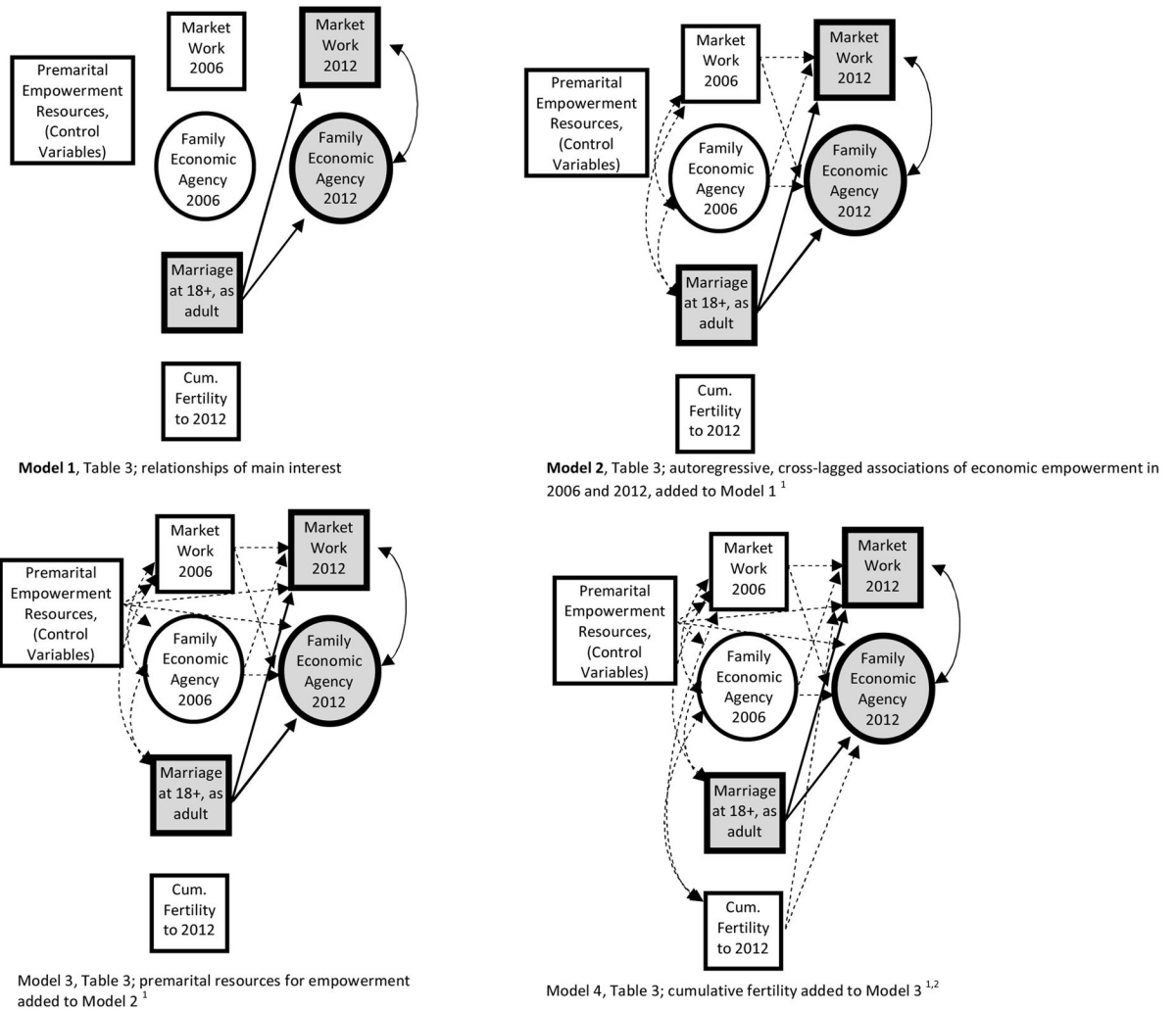


Figure 1. Analytic Model for the Association of Women’s Marriage in Adulthood on their Long-term Post-Marital Economic Empowerment, Married Women 15–43 Years in 2006, Egypt Labor Market Panel Survey 2006 and 2012 Note. Gray boxes are variables of main interest.

Table 1

Sample Characteristics, 4,129 Married Women, Egypt Labor Market Panel Survey (ELMPS), 2006 and 2012

Variable	Total (N=4,129) ^b		First Married as an Adult, 18 Yrs (n=1,782)		First Married as a Child, <18 Yrs (n=624)		p, gp. diff. ^c
	% or Mean, M	SE (SD)	% or Mean, M	SE (SD)	% or Mean, M	SE (SD)	
Demographic Characteristics^a							
Age, M	30.22	(7.14)	30.34	(6.81)	29.86	(8.08)	***
Born in an urban area, %	36.65	0.37	42.35	0.02	19.34	0.02	***
No. of living siblings, M	4.93	(2.19)	4.81	(2.12)	5.30	(2.35)	*
Father is literate, %	44.57	0.45	49.71	0.01	29.00	0.02	***
Mother is literate, %	17.99	0.19	21.41	0.01	7.56	0.01	***
Mother working at respondent age 15, %	6.69	0.01	6.81	0.01	6.34	0.01	*
Completed primary school, %	60.12	0.01	69.42	0.01	31.83	0.02	***
Economically active before age 16, %	7.51	0.01	5.29	0.01	14.24	0.01	***
No. of years married in 2006, M	10.02	(7.41)	8.76	(6.58)	13.89	(8.40)	***
Age at first marriage, M	20.20	(3.82)	21.58	(3.34)	15.98	(1.10)	***
Levels of and Changes in Market Work, 2006 and 2012^{***}							
Engaged in market work 2006, %	23.86	0.01	23.35	0.01	25.38	0.02	***
Engaged in market work 2012, %	21.14	0.01	22.94	0.01	15.59	0.01	***
Performed 2006 and 2012	13.42	0.01	14.56	0.01	9.87	0.01	
Performed 2012 but not 2006 ↑	7.72	0.01	8.38	0.01	5.72	0.01	
Performed 2006 but not 2012 ↓	10.45	0.01	8.78	0.01	15.58	0.02	
Performed neither year	68.41	0.01	68.28	0.01	68.84	0.02	
Levels of and Changes in Family Economic Agency, 2006 and 2012							
Household Purchases 2006, %	72.13	0.01	73.35	0.01	68.55	0.01	***
Household Purchases 2012, %	76.40	0.01	78.72	0.01	69.07	0.03	***
Large purchases 2006, %	43.62	0.01	46.37	0.01	35.30	0.02	***
Large purchases 2012, %	56.00	0.01	58.73	0.01	47.33	0.02	***
Clothes 2006, %	76.36	0.01	78.77	0.01	69.05	0.02	***
Clothes 2012, %	80.07	0.01	81.47	0.01	75.71	0.02	***
Medical 2006, %	74.99	0.01	77.11	0.01	68.59	0.02	***

Variable	Total (N=4,129) ^b		First Married as an Adult, 18 Yrs (n=1,782)		First Married as a Child, <18 Yrs (n=624)		p, gp. diff. ^c
	% or Mean, M	SE (SD)	% or Mean, M	SE (SD)	% or Mean, M	SE (SD)	
Medical 2012, %	77.05	0.01	78.52	0.01	72.46	0.02	***
Increased from 2006 to 2012	41.50	0.01	41.07	0.01	42.87	0.02	
Decreased from 2006 to 2012	28.95	0.01	28.27	0.01	31.19	0.02	
Stayed the same from 2006 to 2012	29.55	0.01	30.66	0.01	25.94	0.02	

^aDemographic characteristics reported in 2006.

^bTotal sample size varies slightly due to 9 missing observations for location of birth, 1 for own employment status before age 16, 5 for mother's employment, 6 for mother's literacy, 8 for father's literacy, 2 for own completed primary schooling, and 4 for total living siblings.

^cp < .10. *p < .05. **p < .01. ***p < .001.

Table 2
 Models of Women's First Marriage in Adulthood and Post-Marital Economic Empowerment, Married Women 15–43 Years at Baseline, Egypt Labor Market Panel Survey 2006 and 2012

Variable (Characteristics of Women)	Model 1 Baseline (unconditional) Model		Model 2 Model 1 Plus 2006 Economic Empowerment Mediators		Model 3 Model 2 Plus Prenatal Resources for Empowerment ^b		Model 4: Model 3 Plus 2012 Control for Cumulative Fertility	
	2012 Market Work γ (SE) ^a	2012 Family Economic Agency γ (SE)	2012 Market Work γ (SE)	2012 Family Economic Agency γ (SE)	2012 Market Work γ (SE)	2012 Family Economic Agency γ (SE)	2012 Market Work γ (SE)	2012 Family Economic Agency γ (SE)
Age at First Marriage 18 Years or Older (AFM18+, ref: <18 years)	0.07(0.04) [†]	0.30(0.07) ^{***}	0.07(0.02) ^{***}	0.17(0.03) ^{***}	0.19(0.07) ^{**}	0.09(0.05) [*]	0.20(0.07) ^{**}	0.09(0.05) [*]
2006 Market Work (MW)			0.46(0.02) ^{***}	0.03(0.06)	0.70(0.03) ^{***}	0.02(0.03)	0.70(0.03) ^{***}	0.02(0.03)
2006 Family Economic Agency (FEA)			0.06(0.01) ^{***}	0.27(0.03) ^{***}	0.14(0.06) [*]	0.21(0.03) ^{***}	0.14(0.06) [*]	0.21(0.03) ^{***}
Correlations among Main Variables								
Correlation of 2012 MW & 2012 FEA	0.04(0.02) [†]		0.02(0.01) ^{**}		0.07(0.03) [*]		0.07(0.03) [*]	
Correlation of 2006 MW & 2006 FEA			0.01(0.01) [†]		0.03(0.03)		0.03(0.03)	
Correlation of AFM18+ & 2006 MW			-0.004		-0.003		-0.003	
Correlation of AFM18+ & 2006 FEA			0.04 ^{***}		0.01 [†]		0.01 [†]	
Model Fit								
RMSEA		0.05		0.03		0.03		0.03
TLI		0.95		0.95		0.92		0.90

Notes: All values besides model fit indices are unstandardized path coefficients.

^a γ (SE) denotes regression coefficients(standard error)

^b Respondent's birth year, mother literate (yes/no), father literate (yes/no), mother employed when respondent was age 15 years (yes/no), number of living siblings, respondent completed primary school (yes/no), respondent performed economic activity before age 16 (yes/no), respondent born in an urban area (yes/no).

[†] p < .10.

* p < .05.

** p < .01.

p < .001

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