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# Journal of Economic Behavior and Organization

journal homepage: [www.elsevier.com/locate/jebo](http://www.elsevier.com/locate/jebo)

## An economic model of early marriage<sup>☆</sup>

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### ARTICLE INFO

#### Article history:

Received 18 September 2016

Revised 30 March 2018

Accepted 1 June 2018

#### JEL classification:

D83

J12

J16

#### Keywords:

Marriage market

Gender

Adolescent development

Fertility

Dowry

### ABSTRACT

To explain female adolescent marriage patterns around the world, we develop a marriage market model with asymmetric information about prospective marriage partners, and a noisy signal about the bride's quality during an engagement. In equilibrium, there is a negative relationship between the age and perceived quality of women on the marriage market and, consistent with available evidence, older brides make higher net marriage payments. The model also implies path dependence in the evolution of adolescent marriage practices over time and persistent effects on marriage practices from transitory shocks. Model simulations show interventions which increase the opportunity cost of early marriage attenuates the association between bride quality and age, triggering a virtuous cycle of marriage postponement.

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### 1. Introduction

The marriage of young female adolescents (henceforth called 'early marriage') remains prevalent in many parts of the world despite repeated efforts by national governments and international development agencies to discourage and end the practice. According to the State of World Population Report 2005, 48% of women in Southern Asia, and 42% of women in Africa in the age group 15–24 years had married before reaching the age of 18 (UNFPA, 2005). Across all developing regions, one-third of women aged 20–24 were married or in a union before the age of 18 during the period 2000–2011 (UNFPA, 2012). A growing literature documents how the timing of marriage for women affects investments in their own education and fertility decisions (Field and Ambrus, 2008), social networks and attitudes towards gender norms (Asadullah and Wahhaj, 2017), as well as the human capital of the next generation (Chari et al., 2017; Sekhri and Debnath, 2014).

In recent years, there has been renewed efforts from national governments and trans-national bodies to address the issue. In July 2015, the United Nations Human Rights Council unanimously adopted a resolution to "eliminate child, early and forced marriage" and the Sustainable Development Goals specifically includes the elimination of child marriage as one of its

<sup>☆</sup> An earlier version of this work was circulated as a working paper under the title "A Theory of Early Marriage". I would like to thank Dilip Mookherjee, Jean-Philippe Platteau, Vijayendra Rao, Debraj Ray, Rajiv Sethi and participants at seminars at the University of Kent, Exeter, Manchester, Nottingham, the 2013 Royal Economic Society Conference at Royal Holloway College, the UNU-WIDER meeting on 'Gender and Development', and the Theoretical Research in Development Economics Workshop at Barcelona Graduate School of Economics for many useful comments and advice on earlier versions of this work. The paper has also benefitted from a large number of discussions with co-researchers and colleagues including Niaz Asadullah, Maria Garcia-Alonso, Anirban Mitra, Mathan Satchi, Katsuyuki Shibayama, Jose I. Silva, and Manuel Toledo. Any errors in the paper are my own. This research has been supported, in part, by funding through the Australian Government's Development Research Awards Scheme (Agreement #66396). The views expressed here are those of the author and not necessarily those of the Commonwealth of Australia.

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targets (5.3) within the broader goal of gender equality.<sup>1</sup> International organisations, and NGOs have invested in developing interventions that raise awareness about the negative consequences of early marriage, that provide parents incentives to postpone marriage for their children, and that provide adolescents new opportunities to acquire skills and alternatives to a traditional path of early marriage and early motherhood.<sup>2</sup>

Despite these recent efforts (and examples of success stories), the overall prevalence of marriage among female adolescents around the world has yet to show a significant downward trend. For example, using data from 48 countries with at least two DHS/MICS surveys in the period 1986–2010, a UNFPA study finds little overall change in the practice in either rural or urban areas (UNFPA, 2012). Two other stylised facts about female early marriage practices are noteworthy. Historically, the practice has been widely prevalent in China, the Middle-East and the Indian sub-continent (Dixon, 1971) while being absent from Europe from at least the beginning of the 18th century, the period in which reliable records begin (Hajnal, 1965). Second, the practice finds its highest prevalence today in the least developed countries (UNICEF, 2016).

In this paper, we develop a theoretical model of female early marriage to address two related questions: (i) What accounts for the variation in female adolescent marriage across population groups and the persistence of the practice in developing countries today? (ii) What are the likely effects of ongoing policy interventions aimed at eradicating early marriage among young adolescents? The theoretical model has two key elements: (a) asymmetric information regarding the ‘quality’ of women on the marriage market; (b) an imprecise technology for detecting the quality of prospective brides during an ‘engagement’. Marriages go ahead when a prospective bride is detected to be of high quality, or their quality remains undetected, but not when they are detected to be of low quality. Consequently, the longer a woman has been on the marriage market, the higher the conditional probability that she was previously found to be of low quality during an aborted engagement.

Because of the negative (equilibrium) relationship between the age and perceived quality of women on the marriage market, men prefer to marry young brides and women are inclined to accept marriage proposals while they are young rather than wait. The higher the proportion of women who accept early marriage offers, the stronger is the negative relationship between age and perceived quality, which induces the next cohort to make similar life choices. This leads to a persistence of early marriage practices. The model includes marriage transfers (bride-price or dowry) determined at the time of marriage by Nash bargaining, where the outside options of the prospective bride and groom serve as threat points. In equilibrium, older brides pay higher net marriage transfers than young brides because of their weaker outside option and worse reputation, which reinforces the inclination of women to marry at a young age.

Large-scale interventions of the kind discussed above provide adolescent girls with opportunities other than marriage. By improving their outside options, these interventions may induce some fraction of adolescent girls – who may otherwise have accepted offers of early marriage – to pursue these opportunities. As more girls postpone marriage for reasons unrelated to their quality on the marriage market, the negative relation between the quality and age of prospective brides declines, causing more men to seek older brides, and more girls to reject offers of early marriage in the next period. Consequently, the reputation of older women on the marriage market improves further and the cycle continues. Thus, expanding non-marriage related opportunities for adolescents can trigger a virtuous cycle of marriage postponement. The fact that an intervention targeted at adolescent girls can make it more and more attractive for future cohorts to postpone marriage means that the long-term impact of such interventions on marriage and subsequent life choices may well exceed the impact on the first cohort which is exposed to it.

The theoretical model thus draws attention to the opportunities for adolescent girls outside of marriage as a determinant of age of marriage. Poor access to education, training and employment for girls – often characteristic of developing countries and regions – can severely limit these opportunities. But the model also highlights that interventions aimed at addressing these constraints have dynamic effects on the marriage market, which needs to be taken into account in policy considerations.

We illustrate this argument and provide a measure of the relevant magnitudes using the case of Bangladesh, which has one of the highest rates of female early marriage today. We solve for key parameters of the model using a number of moment-matching conditions derived from the demographic situation in the country during the 1970s (before the country experienced dramatic changes in fertility and the education and labour force participation of women).

We show that an initiative that increased the opportunity cost of early marriage for women in Bangladesh would trigger a continuous decline in its incidence as per the reasoning above. An increase by half a standard deviation causes the incidence of early marriage to decline by a total of 11 percentage points. But the first cohort exposed to the initiative would experience only between one-third and two-third of this decline. Second, we show that a small-scale randomised control trial of the same initiative would fail to achieve the marriage market equilibrium changes of the full-scale intervention and, therefore, significantly under-estimate its potential for lowering the incidence of early marriage.

<sup>1</sup> <http://www.reuters.com/article/2015/07/02/us-womensrights-un-resolution-idUSKCN0PC25O20150702> .<http://www.un.org/sustainabledevelopment/gender-equality/>

<sup>2</sup> Notable examples include Brac's Adolescent Development Programme in Bangladesh, which provides livelihood training courses, education to raise awareness on social and health issues, and clubs to foster socialisation and discussion among peers; and the Berhane Hewan project in Amhara, Ethiopia, a joint initiative between the New York based Population Council and the Amhara regional government, which uses community dialogue, and simple incentives involving school supplies to encourage delayed marriage and longer stay in school for girls. The World Bank, the UK Department for International Development, and the Nike Foundation are providing support to a number of similar projects around the world.

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