Bride Kidnapping in Kyrgyzstan

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Abstract

This paper provides an economic analysis of the practice of bride kidnapping in Kyrgyzstan based on a Beckerian model of family fertility and consumption. Bride kidnapping is considered to be a way of marrying a wife at lower cost. In our settings, bride kidnapping is rational behavior for an elder generation that values offspring more than does the younger generation. In existence of bride kidnapping, there are imbalanced excess demand and supply of brides of different qualities in the marriage market which then distorted the bride price. We provide an equilibrium analysis of the marriage market where bride kidnapping is allowed and find that bride kidnapping as an informal marriage institution in Kyrgyzstan is in transition from functioning as a way of lowering wedding cost to a symbolic practice. We show that the young women from the bottom of the society is the major victim of the bride kidnapping practice. We also discuss different types of marriage in contrast to bride kidnapping in this paper.

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I. Introduction

Although conventional "love marriage" is perceived as the standard type of marriage in modern societies, other types of marriage still play important role in forming families elsewhere. Among marriage types other than love marriage, coercive marriage, including bride kidnapping, although illegal and morally unaccepted, occurs frequently in Kyrgyz society. Bride kidnapping occurs also in other part of the world, as documented in Becker *et al.* (2017). Indeed, the apparent surge of bride kidnapping in the Central Asian republic of Kyrgyzstan after the collapse of Soviet Union makes it a noteworthy case (Hanrahan, 2004). Today, as many as one-third of Kyrgyz marriages involves bride kidnapping and half of them are non-consensual (Nedoluzhko and Agadjanian, 2015). This issue has been addressed by sociologists and anthropologists but economic explanations are still scarce. In this paper we try to provide an economic analysis of reasons behind bride kidnapping in Kyrgyzstan.

The study of bride kidnapping should be carefully divided into two major types by the nature of abduction act: it can be either consensual, with consent from both parties, or non-consensual, possibly combined with deception and violence (Kleinbach, Ablezova, Aitieva, 2005; Borbieva, 2012; Nedoluzhko and Agadjanian, 2015). Consensual kidnapping, or mock bride theft, is a component the Kyrgyz marriage customs that merits little concern. What matters is non-consensual kidnapping, which is, indeed falsely, perceived as their tradition by ethnic Kyrgyz. This type of kidnapping variety was rare during the pre-Soviet ancient times and was punished both in Soviet and pre-Soviet society. In modern Kyrgyzstan, non-consensual kidnapping violates both Kyrgyz law and Islam Sharia law (Kleinbach and Babaiarova, 2013) but in practice enforcement has been quite limited.

Non-consensual kidnapping can be initiated by either the groom himself with his friends or brothers, or by his mother. In the first case, usually with the permission of the parents, a young man kidnaps his target woman to his home and his female relatives would be responsible for persuading the kidnapped woman to put on a white scarf that represents her consent to the marriage. In the second case, as described in Ismailbekova (2014), the young man's mother deceptively brings a young woman who she believes is a suitable wife for her son to their home and declares that the young woman is kidnapped. Although her son initially may feel shocked, the mother will persuade both his son and the kidnapped woman to accept the marriage. In any case, the kidnapped young woman in general will express her resistance either because she is genuinely upset or in accordance with tradition – a woman is not expected to be eager to marry (Borbieva, 2012) by convention. Nevertheless, an abduction will result in a marriage with high probability. A key reason is that following abduction, people would be dubious about the young woman's chastity and presume that she has been sexually violated after she stays in the man's home overnight. It does not matter if the young woman retains her virginity: the problem is that people are no longer sure about it (Werner, 2009). The limited research available suggests that only 8% of kidnapped young women successfully refuse marriage and leave the groom's home (Kleinbach and Babaiarova, 2013). In Kyrgyz society where virginity is highly valued, returning home after being abducted means that the girl's family would receive far less *kalym,* or kalym (the bride-price for which the groom's family pays to the bride's family for marriage).

Historically, bride kidnapping served as a means to ensure marriages to improve survival rates of the Kyrgyz people, who were mountain nomads living in a harsh natural environment (Hanrahan, 2004). Today, two major reasons may underlie the rising popularity of bride abduction. Many argue that cost of weddings is primary reason for conducting abduction (Werner, 2009). Kidnapping can lower the cost of marriage in both Kyrgyz and Kazakh communities (Borbieva, 2012; Ismailbekova, 2014; Nedoluzhko and Agadjanian, 2015). This is evidenced by its increasing trend beginning in the 1970s, when average wedding expenses increased (Weiner, 2009). Also, its surge after the collapse of the USSR, an era in which Kyrgyzstan and other former Soviet nations encountered economic difficulties, is consistent with the argument that lowering wedding expenses is the major reason for implementing bride abduction.

A second reason can be credited to the elder generation, and above all the groom's mother, as addressed in Ismailbekova (2014). The mother can play a decisive role in her son's marriage, usually having the rights to decide whom her son should marry. The mother may have two incentives of permitting or initiating a bride kidnapping for her son. The anticipated bride can improve the mother-in-law's power in the household since the new bride is expected to be obedient in the groom's family (Borbieva, 2012). A little bit ironically, the kidnapped bride may replace the elder woman's role when she becomes the elder generation. Turaeva and Becker (2016) addressed this 'Queen bee' effect where elder women often play a leading role perpetuating oppression against women. If their sons do not get married in a timely fashion, mothers may push them by mandating a bride abduction (Ismailbekova, 2014). This cycle in Kyrgyz women's life repeats and they can hardly challenge it, partly as a consequence of patriarchal and tribalism tradition (Hanrahan, 2004).

Before formally analyzing the practice of bride-kidnapping in Kyrgyzstan, it is important to first consider the boundary to which our theory can reach. Although non-consensual bride kidnapping is not a Kyrgyz *adat* (wedding in Kyrgyz) tradition, it is a 're-invented' tradition today (Kleinbach and Babaiarova, 2013). In history, bride-kidnapping appears to have been largely consensual or symbolic. But as Kyrgyz society experienced dramatic change throughout the 20th century, kidnapping appears to have been reinvented as a way for Kyrgyz people to respond to changing social norms and competing ideals (Borbieva, 2012). Applying notions from biology, bride kidnapping appeared in history as a mutation, and evolved to adapt to the changing environment. To this point, we may be able to explain why bride kidnapping resurged after USSR collapsed, but to explain why bride kidnapping is rare in other societies with similar social and economic condition may be beyond the scope of our theory. The popularity of bride kidnapping makes it an informal institution of Kyrgyz society, although illegal. As North (1991) writes '…informal constraints … [play]… an important role in the incremental way by which institutions evolve and hence… [are] a source of path dependence'. If we regard bride kidnapping as an institution, its formation and evolution are path dependent. Thus, we need to focus on the social basis of its status quo, rather than arguing why it would appear.

In this paper, we view bride kidnapping as part of the marriage institution, thus we primarily base our discussion on Gary Becker's study of family and marriage problems. In this setting, a family allocates its resources to acquire various goods and services, including their daily consumption and investment in children (Becker and Lewis, 1973). By implementing bride kidnapping, the family gains advantage in at least two aspects. First, the groom is able to have his own offspring so that they enjoy the utility from additional children/grandchildren. Second, bride kidnapping lowers wedding costs and the family can use saved resources to increase their consumption, invest more on the child's quality or simply support more babies. Becker's work on marriage also focuses on the production and distribution of family goods (Becker, 1973). If we regard a child as one of the family products produced by the family, the quality of the wife is essential to determine the productivity, or specially, the quality of the product. A series of literature has found strong evidence for a positive effect of maternal education on child's health and other characteristics (Thomas, Strauss and Heriques, 1990). Thus, the groom's family has to trade-off between a lower wedding cost and a higher quality wife. In this cost-benefit analysis, we have to incorporate the possibility that the groom can choose to work abroad for years and bring money back to marry a better wife. In the Kyrgyz setting, the family can choose to send their son(s) to work in Russia, thereby earning a far higher income than in rural Kyrgyzstan. Upon return, he will have greater wealth and can woo a higher quality wife – but at the cost of delayed marriage and fertility. Thus, the choice of when and how to marry largely reflects the groom's family's time discounting and preferences for wife/daughter-in-law and hence child/grandchild quality (and quantity).

Having outlined the main issues and parties involved, we now turn to formal modeling. The rest of this paper is organized as follows: Section II presents our model for analyzing bride kidnapping behavior in which we deal with problems of different agents involved in a bride kidnapping, including the elder generation in the groom's family, the groom and the bride. Section III discusses implications of our model and extends the model to different types of marriage. Section IV concludes.

II. The Model

A. The groom's family's problem without bride kidnapping

a. Basic Setting: marrying at $t = 1$

We consider an intertemporal maximization problem of the Kyrgyz groom's family with three periods. At $t = 1$, suppose we have a young man who has just reached (exogenously defined) marriage age. His family has to pay an expensive *kalym* to his potential bride's family. Young as he is, his desire for marriage is not that urgent, so he has two options: he can either get married immediately or work abroad in Russia for one period to earn a better salary so that he can marry a better wife somewhat later (the implicit assumption being that increased wealth improves a man's marriage prospects).

The benefit from a better wife could come from various aspects. First, the most direct, since marrying someone who you will live together lifelong is important, the groom will be prudent in choosing a wife who is wise, beautiful and with a good temper. Second, her productivity in producing family goods, as mentioned in Becker (1973), would be higher so that the groom's family members will be better off. Third, as much literature has suggested, wife's education has positive influence on the child's health and human capital accumulation. Fourth, a good wife could also increase the utility of the groom's parents by sharing housework and providing care. In short, *ceteris paribus*, a wife with higher quality, while at higher cost, could yield higher utility to the groom's family. We incorporate the multiplier effect of a high-quality wife in her effect on the child's quality. That is, given the amount of investment on their child, the child will be of higher quality if his/her mother has higher quality. We adopt Becker and Lewis (1973)'s idea that a family regards children as durable goods and cares the quality of its offspring. As they suggest, the family's utility function depends on both the number and quality of its children as well as consumption of other goods, which takes the form

$$U = U(y, n, q) = u(y) + v(n, q),$$

and is subject to the budget constraint: (1)

$$I = \pi_y y + \pi n q.$$

According to their notation, π_y and π are the price of all other commodities y and the price of children that regards both quantity n and quality q, respectively. Meanwhile, as in Bethmann and Kvasnicka (2011), it is reasonable to have

$$v(0,0) = v(0,q) = v(n,0) = 0. \tag{2}$$

If the young man chooses an immediate marriage, his family has to spend a wedding cost c (including *kalym*) on marrying a bride who values c. This value can represent the bride's various characteristics including beauty, family goods productivity and the most important, her education level that affects their child's quality. By our assumption, mother's education level, indicated by the wedding cost c, augments the effect of investment on child's quality q: given the amount of investment q, the child's real quality will be qc. The utility function hence can be rewritten as $U = u(y) + v(n, qc)$. After marrying at $t = 1$, he will have his own children in the next period and enjoy the pleasure from offspring at $t = 2$ and $t = 3$. The family has to trade-off between an instantaneous loss in utility resulted from a higher wedding cost c and future gain from having a child with higher quality. For simplicity, in our base model we assume the couple will only give birth to one baby.

Before exploring the family's utility maximization problem, another effect of wedding cost c needs to be considered. In Kyrgyz society, paying a high wedding cost demonstrates the family's wealth and power and will bring local reputation to the family. As this concern becomes strong enough, the family has incentive to pay a higher wedding cost compared to their income than they would in the absence of such a demonstration effect. This phenomenon can be important in rural areas, and not only in Kyrgyzstan, but also in China and other middle and upper middle-income countries. Formally, we model this effect by adding a term $k \ln c$ to the family's utility maximization problem to represent the reputation brought by the wedding cost, where k is the value attached to the demonstration effect. This parameter k is socially determined but also varies across particular households. The family's intertemporal utility maximization problem is:

$$\max_{y_1,y_2,y_3,c,q,s_1,s_2} u(y_1) + \delta[u(y_2) + \beta v(1,qc)] + \delta^2[u(y_3) + \beta v(1,qc)] + k\ln c$$

$$\begin{gathered} s.t.\ \ I = s_1 + c + \pi_y y_1 \\ s.t.\ I + rs_1 = s_2 + \pi_y y_2 + \pi q \\ s.t.\ I + rs_2 = \pi_y y_3 \end{gathered} \tag{3}$$

where r is the real return to saving and s_1, s_2 are the amount of savings at $t = 1$ and $t = 2$; the coefficient β measures the relative importance the groom or his parents put on the utility from a child compared with that from consumption of other commodities. We adopt the simple logarithmic form of the utility function that has the nice property of constant relative risk aversion (CRRA; Diamond and Köszegi, 2003): $u(y) = \ln y$ and $v(n, qc) = (1 - \alpha) \ln n + \alpha \ln qc$, where the latter is a logarithmic form of Cobb-Douglas utility function and is reduced to $v(y) = \alpha \ln qc$ since $n = 1$. Solving this problem gives the family's maximized utility

$$U_{marry} = [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)] \ln y_1^m + (\delta + 2\delta^2) \ln r\delta + \alpha\beta(\delta + \delta^2)[\ln \frac{\alpha\beta(\delta + \delta^2) r\pi_y}{\pi} + \ln(\alpha\beta(\delta + \delta^2) + k)\pi_y + k \ln[(\alpha\beta(\delta + \delta^2) + k)\,\pi_y] \tag{4}$$

where

$$y_1^m = \frac{(1 + \frac{1}{r} + \frac{1}{r^2}) I}{\pi_y [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]}.$$

b. Working before the marriage: marrying at $t = 2$

Alternatively, a young man can postpone his marriage and work abroad in Russia or neighboring Kazakhstan for this period and bring enough wealth home to marry a better wife. We assume that, if the groom works in the first period, he could have an extra income of ΔI in the second period. But, there is also obvious cost of a later marriage: he would delay the utility flow of having his own child until $t = 3$. It is worth noting that our model makes little difference between a model with an infinite time horizon, because a child will bring utility in every period after she is born and the infinite sum of the two series of discounted utility flows will differ only by the first term. If the young man chooses to work first, the family's intertemporal utility maximization problem becomes

$$\max_{y_1, y_2, y_3, c, q, s_1, s_2} u(y_1) + \delta u(y_2) + \delta^2 [u(y_3) + \beta v(1, qc)] + \delta k \ln c$$

$$\begin{aligned} s.t.\ \ I &= s_1 + \pi_y y_1 \\ s.t.\ I + \Delta I + r s_1 &= s_2 + \mathrm{c} + \pi_y y_2 \\ s.t.\ I + r s_2 &= \pi_y y_3 + \pi q \end{aligned} \tag{5}$$

The maximization problem gives the family's maximized utility in case of working prior to marrying:

$$U_{work} = [1 + (1 + k)\delta + (1 + 2\alpha\beta)\delta^2] \ln y_1^w + (\delta + 2\delta^2) \ln r\delta + \alpha\beta\delta^2 \left[\ln \frac{\alpha\beta\delta^2 r^2 \pi_y}{\pi} + \ln(\delta k + \alpha\beta\delta^2)\, r\pi_y\right] + \delta k \ln(\delta k + \alpha\beta\delta^2) r\pi_y \tag{6}$$

where

$$y_1^w = \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \frac{1}{r}\ \Delta I}{\pi_y [1 + (1 + k)\delta + (1 + 2\alpha\beta)\delta^2]}.$$

They will prefer an early marriage if $U_{marriage} > U_{work}$ and *vice-versa*. Denoting the difference between these two utilities as $\Delta U_w = U_{marry} - U_{work}$, we have following observations.

Proposition 1 The groom's incentive of postponing his marriage in order to marry a better wife is
(1) increasing in ΔI, the extra amount wealth he can make from the working opportunity
(2) decreasing in I, his income level;

(3) decreasing in β, his weight on child, if $U_{marriage} \geq U_{work}$.

Proof.

The first statement is obvious. To prove the second statement, notice that

$$\frac{\partial \Delta U_w}{\partial I} = [1 + k + (1 + 2\alpha)(\delta + \delta^2)]\frac{1}{I} - [1 + (1 + k)\delta + (1 + 2\alpha)\delta^2]\frac{1}{I + \frac{r\Delta I}{1 + r + r^2}}$$
$$> [1 + k\delta + (1 + 2\alpha)\delta + (1 + 2\alpha)\delta^2]\frac{1}{I} - [1 + (1 + k)\delta + (1 + 2\alpha)\delta^2]\frac{1}{I} > 0.$$

For the third statement, it is complicated to take the derivative of ΔU_w with respect to β. But it is easy to observe this fact by plotting ΔU_w in response to the change of β. The numeric simulation on computer suggests that $\frac{\partial \Delta U_w}{\partial \beta} > 0$ holds not only when $U_{marriage} \geq U_{work}$, but also for almost all $\beta > 0$ under different parameter settings.

These results suggest that a richer family will be less willing to postpone the young groom's marriage. The third statement of Proposition 1 has an important implication. In our basic settings, we regard the groom's family as a single entity to make the decision. However, family members within household may have idiosyncratic preferences over the utility from having a child. Specially, in the context of marriage problem, the elder generation usually has a stronger incentive to let their children get married earlier than the younger generation has planned. There are various reasons for this idiosyncratic preference: the elder generation may hope to have grandsons and granddaughters sooner so that they can take care of their grandchildren when they are still capable of the task. In cultures in which having offspring is of vital importance, the elder generation wants to guarantee the continuation of their ancestral line, hence they would pressure their children to get married and give birth to a baby as soon as possible.

In contrast, marriage circumscribes freedom and hinders self-promotion in the perspective of some members of the younger generation. They may rationally regard marriage and child-bearing as less important to them than to their parents. In our model, these idiosyncratic preferences are captured by the relative weight on the utility from child, *i.e.*, the β. We assume that the elder generation weighs more heavily the utility from having offspring more than the younger generation. Intuitively, if the elder generation yearns to have grandchildren, their loss caused by their son's postponed marriage will be correspondingly high so that given the extra income their son can earn, they will have stronger incentive to push their son to marry early than late. The third statement in Proposition 1 suggests that, there must be some range of extra income ΔI in which the elder generation will prefer their son to marry at $t = 1$ while the young man wants to marry at $t = 2$. In a society controlled by the elder generation, which is effectively the case rural Kyrgyzstan, the elder generation will have both incentive and ability to force a marriage for their child against his will. The result is shown in Figure 1.

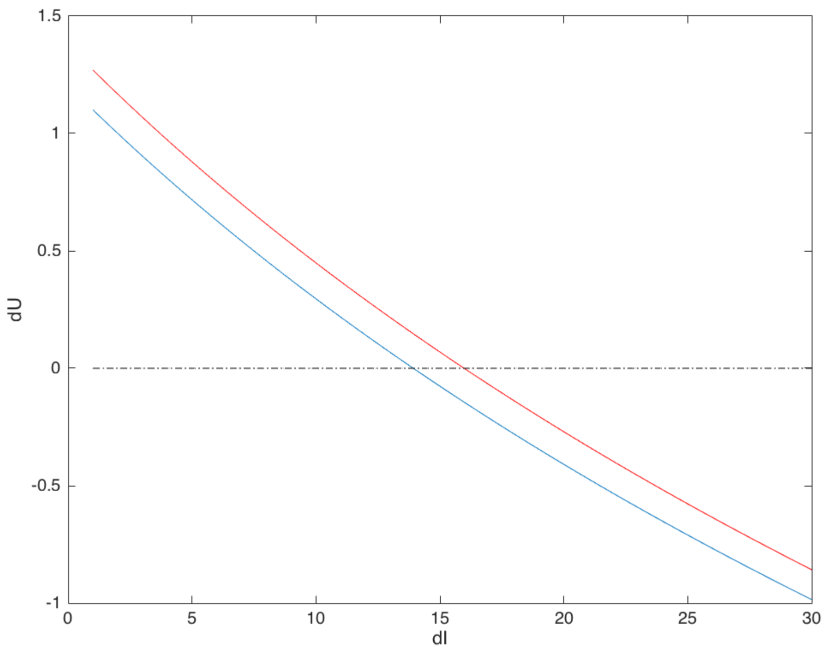


Figure1 Differing intergenerational preferences over children

In Figure 1, the line on the left represents the younger generation while the line on the right represents the elder generation with larger β. It shows that with a larger weight on the utility from child, the elder generation will be reluctant to allow their sons to work outside the community even if the working opportunity is profitable enough from their son's perspective. Family members can bargain over this decision, but in practice bargain power is not equally distributed between the elder and the younger generation. The elder generation controls social norms, and finds it both rational and feasible to force a marriage for their son. The forced marriage can be an arranged marriage, a hurried love marriage, or a non-consensual kidnapped marriage. In this sense, bride kidnapping initiated by the elder generation counters the younger generation's will to postpone marriage and thus is socially rational as it meets the needs of the group of people who control social norms.

B. The groom's family's problem – with bride kidnapping

a. The effect of bride kidnapping

In addition to the motivation from the elder generation, there are other reasons counting for the practice of bride kidnapping. A primary reason among them is that bride kidnapping can lower the wedding cost (Werner, 2009; Borbieva, 2012; Ismailbekova, 2014; Nedoluzhko and Agadjanian, 2015). This is consistent with the likely increase in the frequency of non-consensual bride kidnapping after the collapse of USSR when the real income of the Kyrgyz population plummeted.

Formally, we regard bride abduction as a way of marrying a woman of the same quality but at less wedding cost; specifically, bride kidnapping enables the young man's family to marry a woman who values c with a cost of $c - \Delta c$. Here we consider the kidnapping discount Δc as a fixed value among the society for two reasons. First, inter-class bride kidnapping is not likely to happen. A high "discount value" of Δc, which means the young man plans to kidnap a girl from family that is far richer and powerful than his own family, will make the bride abduction almost impossible to succeed. The young woman's family will have both incentive and ability to deter the kidnapping from a success by either calling the police or forcing the man's family to return their daughter. Second, as suggested by previous literature families that are relatively poorer are more likely to involve in a bride kidnapping (Kleinbach and Salimjanova, 2007). Sexually assaulting a young woman of higher social status is a poor idea, and the young woman herself is most unlikely to agree to marriage, so that the kidnapping has little chance of being successful – and there are many potentially negative consequences.

The benefit from kidnapping wedding plus *kalym* discount constitutes a smaller portion to the total utility of families that are wealthier. This is captured by the fact that $\frac{\Delta c}{c}$ gets smaller as c increases. We require $\Delta c \geq 1$ so that $\ln \Delta c \geq 0$. Briefly, bride kidnapping seems likely to tarnish a family's reputation rather than to polish it, so that Δc is likely to decline with income and hence wedding expenses; at a minimum, it will rise less rapidly than total wedding costs.

If bride kidnapping is socially accepted, it offers the third option to the groom's family: to kidnap a bride and marry at $t = 1$. The family will benefit from a lower wedding cost while suffering from a loss in their reputation. In this case, the groom's family's problem can be written as

$$\max_{y_1, y_2, y_3, c, q, s_1, s_2} u(y_1) + \delta[u(y_2) + \beta v(1, qc)] + \delta^2[u(y_3) + \beta v(1, qc)] + k \ln \frac{c}{\Delta c}$$

$$\begin{gathered} s.t.\ \ I = s_1 + c - \Delta c + \pi_y y_1 \\ s.t.\ I + r s_1 = s_2 + \pi_y y_2 + \pi q \\ s.t.\ I + r s_2 = \pi_y y_3 \end{gathered} \tag{7}$$

Notice the first budget constraint can be rewritten as $I + \Delta c = s_1 + c + \pi_y y_1$. This is to say that the effect of a bride kidnapping is as if the groom's family has extra income in the first period. As we will see, this shadow income will be distributed between the normal consumption and the actual paid wedding cost. Meanwhile, although unlikely, we will not eliminate the possibility of $\Delta c > c$. This could happen if the bride effectively transfers some wealth from her family to the groom's family to ensure the quality of her life after marriage. The amount of wealth brought by the bride functions similarly as the shadow income, and they are jointly incorporated in Δc. This utility maximization problem gives the solution:

$$\begin{aligned} U_{kidnap} = {} & [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)] \ln y_1^k \\ & + (\delta + 2\delta^2) \ln r\delta + \alpha\beta(\delta + \delta^2)[\ln \frac{\alpha\beta(\delta + \delta^2) r \pi_y}{\pi} + \ln(\alpha\beta(\delta + \delta^2) + k)\pi_y \\ & + k \ln[(\alpha\beta(\delta + \delta^2) + k)\, \pi_y] - k \ln \Delta c \end{aligned} \tag{8}$$

where

$$y_1^k = \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c}{\pi_y [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]}.$$

Compared with the situation in which bride kidnapping is not allowed, bride kidnapping has two impacts on the marriage decision: first, it is clear that $y_1^k > y_1^m$, therefore $U_{\text{kidnap}} > U_{marry}$ if social reputation were not taken into consideration, *i.e.*, if $k = 0$; second, an additional loss in social reputation will negate part or all of the benefit from paying a lower wedding cost. The groom's family has to trade-off between the two contradictory effects if they plan to implement a bride kidnapping. The net effect of a bride kidnapping, as denoted by $\Delta U_k = U_{marry} - U_{kidnap}$, depends on the value of Δc and their income level I:

$$\Delta U_k = U_{marry} - U_{kidnap} = [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]\left(\ln y_1^m - \ln y_1^k\right) + k \ln \Delta c$$
$$= [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)] \ln \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I}{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c} + k \ln \Delta c. \tag{9}$$

While the first term is negative and the second term is positive, implementing a bride kidnapping can be either a wise or a stupid decision from the perspective of the groom and his family. Notice that $\Delta U_k < 0$ when $\Delta c = 1$, which is the minimum possible cost to their reputation. Depending on the derivative, it is possible that either $\Delta U_k < 0$ holds for all $\Delta c > 1$, which means bride kidnapping is always rational; or ΔU_k changes non-monotonically with Δc. Consider the derivative

$$\frac{\partial \Delta U_k}{\partial \Delta c} = \frac{k}{\Delta c} - \frac{[1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]}{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c}$$
$$= \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) kI - [1 + (1 + 2\alpha\beta)(\delta + \delta^2)]\Delta c}{\Delta c \left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + (\Delta c)^2}. \tag{10}$$

It equals zero when

$$\Delta c = \Delta c^* = \frac{(1 + \frac{1}{r} + \frac{1}{r^2})kI}{1 + (1 + 2\alpha\beta)(\delta + \delta^2)} \tag{11}$$

and it is smaller than zero when $\Delta c > \Delta c^*$. In other words, given the family's income level I, if the reputational concern k is small enough so that

$$k < k^* = \frac{1 + (1 + 2\alpha\beta)(\delta + \delta^2)}{(1 + \frac{1}{r} + \frac{1}{r^2})I}, \tag{12}$$

we will have that $\Delta c^* < 1$ and the derivative $\frac{\partial \Delta U_k}{\partial \Delta c} < 0$ holds for all $\Delta c \geq 1$, which implies that ΔU_k is smaller than zero constantly.

If $\Delta c^* > 1$, the result is not trivial. In this case, ΔU_k is increasing in Δc in the range $[1, \Delta c^*]$ and decreasing in Δc when $\Delta c > \Delta c^*$, so ΔU_k reaches its maximum value at $\Delta c = \Delta c^*$. It is possible, however, that this maximum value is smaller than zero, implying that bride kidnapping is always better than a normal marriage. To show this, notice that the maximum of ΔU_k takes the form:

$$\Delta U_k^* = [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)] \ln \frac{1 + (1 + 2\alpha\beta)(\delta + \delta^2)}{1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)} + k \ln \Delta c^*, \qquad (13)$$

where we only require $\Delta c^* > 1$. Since the first term is negative, if Δc^* is only a little bit greater than 1, it is possible that $\Delta U_k^* < 0$. If the maximum value is greater than zero, then there will be a range of Δc with which bride kidnapping causes more reputational loss than actual benefit. Intuitively, given the family's income I and the wedding cost discount level Δc, so long as the reputational concern is strong enough, bride kidnapping will not be the correct choice. Formally, to show the existence of such a range, we need to prove that the maximum value can be greater than zero. Lemma 1 gives the proof of these results.

Lemma 1. As long as the reputational concern k is strong enough, there exists a range of Δc in which bride kidnapping is not the rational choice.

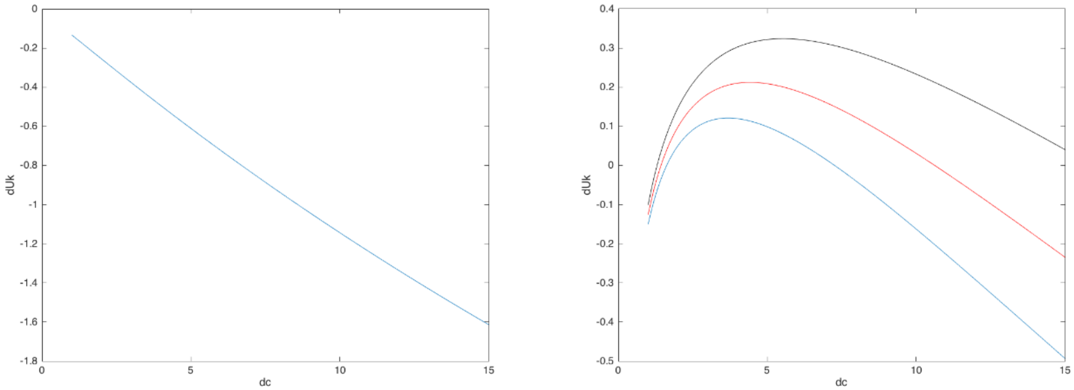
Proof. See Appendix A.

Lemma 1 shows that so long as the family's reputational concern is strong enough, for a range of wedding cost discount Δc, they will not implement bride kidnapping. Indeed, we have an even stronger result: given family income level I and wedding cost discount Δc, so long as this reputational concern is strong enough, the family will not abduct a bride.

Lemma 2. Given a family's income level I and socially determined wedding cost discount Δc, there exist k such that $\Delta U_k > 0$.

Proof. See Appendix B.

Figure 2 demonstrates ideas in the discussion above. Figure 2(a) is the case in which the reputational is weak, i.e., $k < k^*$ so that $\Delta c^* < 1$. Bride kidnapping will always yield higher utility than marrying through a normal channel in this situation. Figure 2(b) shows the case where there is a range of Δc with which the family will not abduct a bride for marriage. In Figure 2(b), curves to the right represents family with higher income level. It shows that given Δc, the incentive of involving in a bride kidnapping is decreasing in the family's wealth. We can simply prove it by noting that ΔU_k is increasing in I. A richer family is less likely to abduct a bride because the utility from paying a lower wedding cost constitutes only a small portion of its total utility while the cost of reputation remains constant. Therefore, even if bride kidnapping can lower wedding cost, not all families will choose this option. Comparatively speaking, families that are burdened with financial stress and (probably hence) care less about their reputation should favor bride kidnapping.



(a) $k < k^*$ (b) $k > k^*$ and $\Delta U_k^* > 0$

Figure 2 The effect of Δc

It is also noteworthy that bride kidnapping has asymmetric impact on the elder and younger generations' decision. Caring more about the utility from having offspring, the elder generation will benefit more from an early marriage than will the younger generation, given a fixed reputation cost. This can be proved by the observation that $\frac{\partial \Delta U_k}{\partial \beta} < 0$. Therefore, the elder generation not only has an incentive to force their sons to marry early, but also is more likely to initiate bride kidnapping as a means to achieve the target. We conclude these observations as Proposition 2.

Proposition 2 The groom's family's incentive to implement bride kidnapping is

(1) Decreasing in the family's level of concern about its social reputation k and income level I;

(2) Increasing in the amount of wedding cost discount Δc, when $k < k^*$; *i.e.*, if social reputation is not or barely the groom's family's concern. In this case, bride kidnapping will always be beneficial;

(3) First decreasing then increasing in the amount of reduced wedding cost Δc, when $k < k^*$; *i.e.*, if the family is concerned with its reputation. As long as Δc is large enough, bride kidnapping will be always worthwhile;

(4) Increasing in its weight on utility from having offspring β.

b. Three options

If bride kidnapping is socially accepted, a family will have three options when comes to a marriage: either through normal channels (love or arranged marriage), by bride kidnapping, or after a spell working abroad and earning extra income. Compared with the situation where there is no bride kidnapping, implementing bride abduction can either move the curve in Figure 1 upward or downward. While a higher extra income ΔI allures the younger generation to postpone their marriages, the effect of a higher discount Δc is not monotone. Combining the three options together, the best option can be any of them, depending on the value of Δc and ΔI. We conclude different situations in Figure 3.

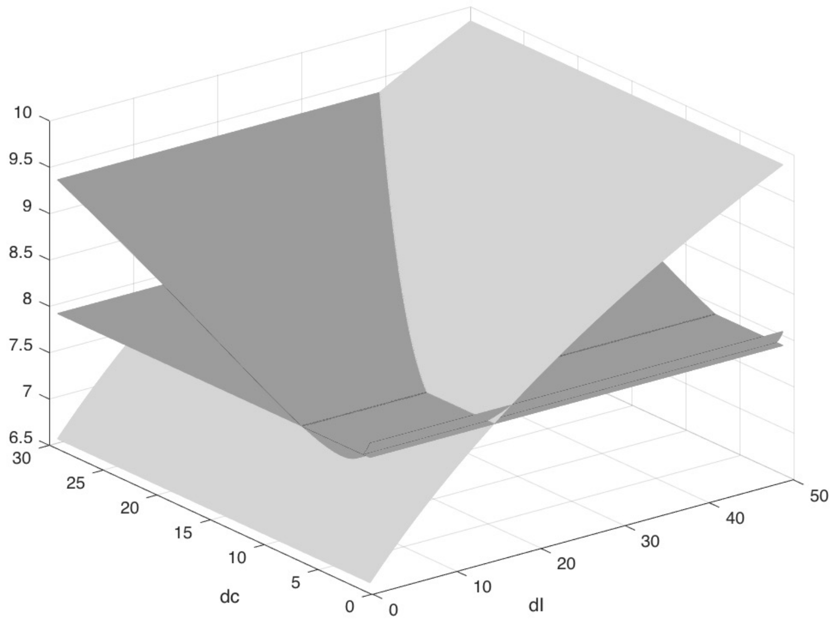
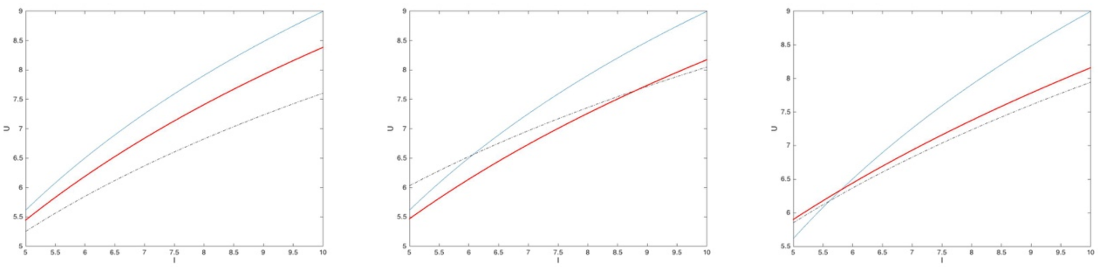


Figure 3 Three Options ($k > k^*$)

In Figure 3, which is the case when $k > k^*$, the dark plane is the base case of marrying a bride through a normal channel at $t = 1$ so it does not vary with Δc and ΔI; the light curved surface represents the decision to marry at $t = 2$ after working abroad for a period; the dark curved surface is the case of kidnapping a bride for marriage. From this figure, we can find the best strategy in different situations. First, conventional marriage without working abroad is the best option if the working opportunity is not that lucrative and bride kidnapping does not lower the wedding cost too much. Second, postponing the marriage becomes the best option when working abroad can bring the family enough fortune to marry a better wife. Third, bride kidnapping is the optimal choice if working abroad can not only increase the family's income a moderate amount but also lower the wedding cost significantly. Finally, if social reputation is not the concern, namely, k is small enough, then marrying conventionally will never be the best choice.

Bride kidnapping also has another social impact in a broad sense. In Figure 3, in regions where the dark curved plane is above the light curved plane; *i.e.*, bride kidnapping brings more utility than working aboard, those people who would have chosen to work first and gotten married at $t = 2$ now will choose bride kidnapping and get married at $t = 1$. Bride kidnapping thus allows a greater proportion of young men to get married early. Since those who marry at $t = 2$ are likely to be older than those who get married at $t = 1$, bride kidnapping as a social institution increases the supply of grooms who are peers of brides in each period and narrows the average age gap between the groom and the bride. Brides need not marry a man who can afford the *kalym* but is far older than her. This is not a bad thing for those young women and men who wish to marry their peers – and also makes the welfare impacts of kidnapping (in principle) ambiguous.

Another problem of interests is given the exogenous working opportunity ΔI and the socially determined wedding cost discount Δc, for a family with income I, what is the best strategy for getting a bride. We have shown in previous section that given ΔI and Δc, the family's incentive of working abroad or involving in a bride kidnapping is decreasing in the family's income level. Ultimately, if the family's income reaches a certain level, marrying through the normal channel – either a love marriage and an arranged marriage – is the best choice. But for an arbitrary I, it is not easy to tell which is the best strategy. When the family's income level is relatively low, the best strategy can be any of the three ways, as shown in Figure 4.



(a) (b) (c)

Figure 4 Best Strategies for the family

In Figure 4, the thin full line represents the utility from marrying through the normal channel; the thick full line represents the utility from bride kidnapping and the dotted-dash line represents the utility from working abroad. If the working opportunity is profitable, working abroad first would be the best strategy for low-income families, as in Figure 4(b); if the wedding cost discount is huge, bride kidnapping can be a good choice, as in Figure 4(c); if the extra income from working opportunity and the wedding cost discount are both low, marrying through the normal channel can be the dominant strategy for all I, as in Figure 4(a). That is, if marrying through the normal channel is the best strategy for the poorest family, it is the best strategy for all families. This is a natural result from Proposition 1(a) and Proposition 2(a); briefly speaking, U_m increases faster with I than U_w and U_k. Showing the best strategy for family with different income has an important implication to their behavior on marriage market: the family makes decision based on their utility, not the quality of bride. As the income increases, their utility will change continuously, but it is not true for the quality of bride they would marry, which we will show in the next part.

c. Comparative statics

So far we have discussed only the impact of bride kidnapping on the marriage decision. Indeed, it also influences the groom's family's other options. First we consider the family's consumption on other normal goods. The intertemporal utility maximization problem in (3) gives the relationship between consumption in different periods given that $y_1 = \frac{1}{r\delta} y_2 = \frac{1}{(r\delta)^2} y_3$, and this holds in all three situations; meanwhile, (4) gives the value of y_1 when bride kidnapping occurs:

$$y_1^k = \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c}{\pi_y [1 + k + (1 + 2\alpha\beta)\delta + (1 + 2\alpha\beta)\delta^2]}.$$

The groom's family increases its consumption in each period as lowered cost increases disposable income. Suppose the groom will marry a woman of value $\bar{c}$ when bride kidnapping is not allowed; with kidnapping (and assumed convex preferences) he will not marry a bride of value $\bar{c} + \Delta c$ but of value a little bit lower than that value, which equals

$$c_k = [\alpha\beta(\delta + \delta^2) + k]\pi_y y_1^k < [\alpha\beta(\delta + \delta^2) + k]\pi_y y_1^m + \Delta c = \bar{c} + \Delta c. \qquad (14)$$

Meanwhile, it can be anticipated that the reduced wedding cost will be used to invest as well in the quality of future children. Thus, the family's benefit from bride kidnapping comes not only from an increase in its consumption, but (in principle – not terribly likely in reality) also from more investment on the child's quality, since

$$q_k = \frac{\alpha\beta(\delta + \delta^2) r\pi_y}{\pi} y_k > \frac{\alpha\beta(\delta + \delta^2) r\pi_y}{\pi} y_m = q_m. \qquad (15)$$

On the other hand, if the groom works abroad first, he will pay a wedding cost of

$$c_w = [k\delta + \alpha\beta\delta^2] r\pi_y y_1^w, \qquad (16)$$

where y_1^w is defined in (6). One possible (if again unlikely) situation occurs when working abroad is lucrative enough for the groom to postpone his marriage, but his preferences are such that he would rather spend more of his extra income on the consumption of other commodities to increase his utility rather than on marrying a better wife. In this case, he will choose to marry a wife of value $c_w < \bar{c}$ even if after he returns home with additional wealth. This could happen if the groom places less weight on the utility from having a child while the extra income earned abroad is fairly low.

Figure 5 demonstrates this idea, where the blue lines represent the younger generation with smaller β and the red lines represent the elder generation who puts more heavily weights utility from offspring; the full lines are their utilities while dotted lines are the quality of bride they prefer. For the certain level of ΔI as denoted by the gray vertical line in Figure 5, both the elder and the younger generation agree to postpone the marriage (two full lines are both below zero); but the younger generation wants to spend more on consumption rather than marrying a better wife (the blue dotted line is above zero), while the elder generation wants him to marry a better wife (the red dotted line is below zero). Besides the reason of offspring, these idiosyncratic preferences are consistent with the observation in Borbieva (2012), that the groom's mother gains more power in the family if she has a daughter-in-law. Even if the elder generation agrees with their child on a later marriage, they will require their son to marry a better wife rather than increase consumption of other goods. To some degree, then, the elder generation makes the "right" decision for their son.

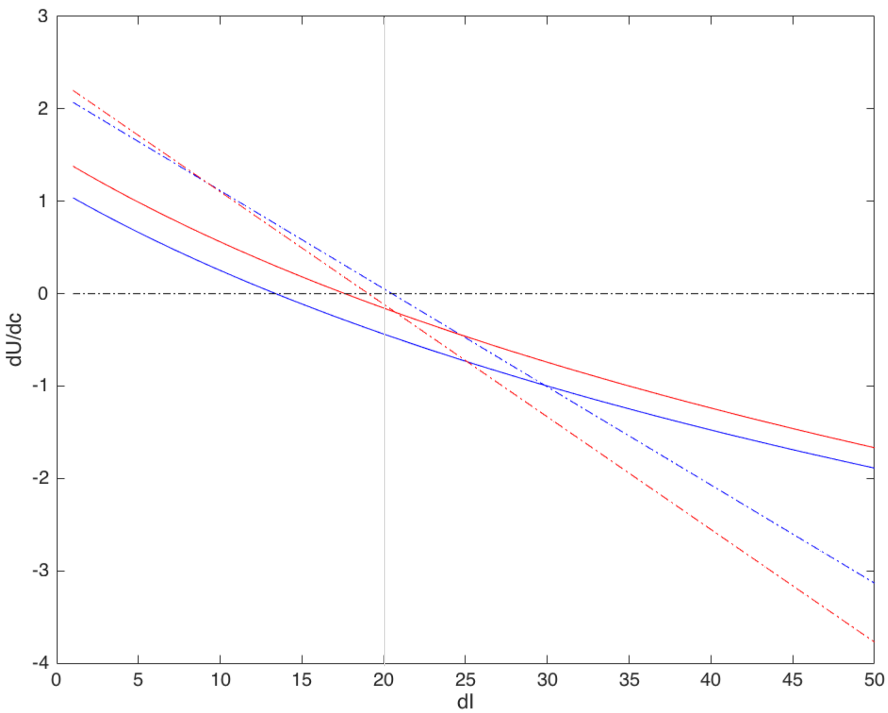


Figure 5 Preferred bride quality from the perspective of the groom and his parents

As mentioned above, while the utility changes continuously with family's income level, the quality of bride they will choose to marry shows discontinuity: family with higher income will not necessarily marry a bride with higher quality. Figure 5 shows one side of the result: after working abroad, the younger generation could have the incentive to marry a wife who has even lower quality than he would marry if he had not worked. The other side of this discontinuity occurs in the comparison between the quality of wife a family would marry through the normal channel and a family would marry by bride kidnapping. As shown in Figure 4(c), for family with low income, the best strategy is to abduct a bride for marriage; as the family's income level increases, the best strategy changes to marrying through normal channels. Let's consider the cutoff points. At the cutoff point, we have $\Delta U_k = 0$. If the family would marry through the normal channel, it will choose a bride of quality $c_m = [\alpha\beta(\delta + \delta^2) + k]\pi_y y_1^m$; if the family implements a bride kidnapping, it will target on a bride of quality $c_k = [\alpha\beta(\delta + \delta^2) + k]\pi_y y_1^k$. Comparing equation (4) and (8), we know that $y_1^m < y_1^k$, therefore $c_m < c_k$. Since c_k changes continuously with I, we could expect that for a family with income a little lower than the cutoff level, it will still choose a bride of quality higher than c_m. Therefore, in the marriage market where bride kidnapping is allowed. Figure 6 demonstrates the discontinuity of bride quality with respect to family income level I.

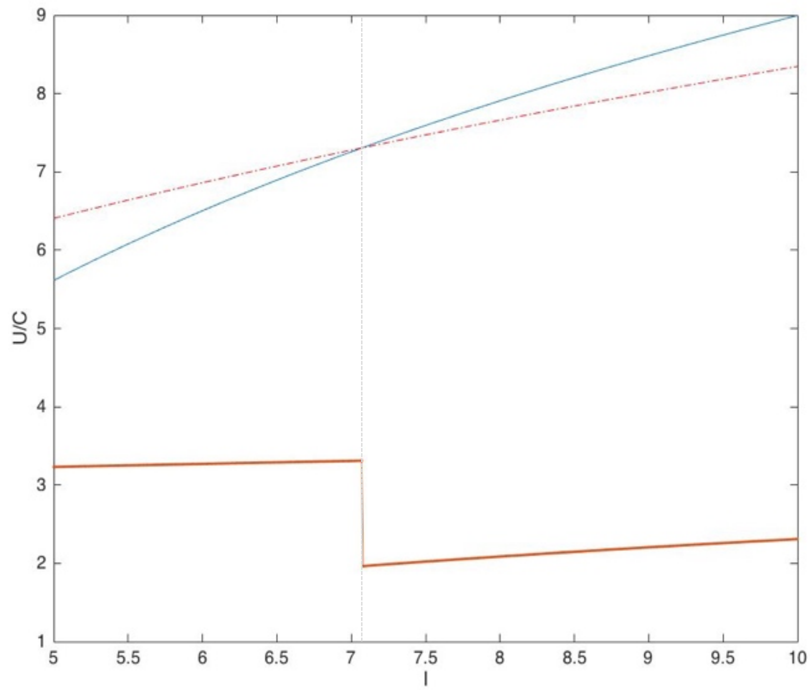


Figure 6 Discontinuity of bride's quality

In Figure 6, the full line represents the U_m and the dotted line represents U_k; the broken line below is the quality of bride a family with income I would marry to achieve the maximum utility. Clearly at the cutoff points there is a sudden drop in the quality of bride the groom would choose to marry. In this sense, an assortative mating equilibrium in Becker's setting cannot be expected in a world with bride kidnapping. This discontinuity has important implications to the equilibrium of the marriage market with bride kidnapping, which we will discuss in the next section.

III. Implications and Extensions

A. Marriage Market Equilibrium

In our discussion above, we implicitly regard the marriage market as a market of brides: brides are the suppliers of the commodity 'bride' while grooms demand this commodity. We assume a cluster of markets of brides of different qualities that take continuous values. In case without bride kidnapping, groom pays a bride price c to marry a bride of quality c, hence the bride price is indeed the price of bride. From (16), the bride price a groom is willing to pay is continuous in his (family's) income level I, this suggests a pattern of positive assortative mating in the marriage market: high-income groom marries high-quality bride and low-income groom marries low-quality bride. As suggested by Becker (1981), positive assortative mating is usually the pattern shared by an efficient marriage market. However, we have proved that positive assortative mating will no longer hold in a marriage market with bride kidnapping. Those grooms with low income can marry a bride with higher quality than they could have afforded by kidnapping a bride. Figure 7 demonstrates that a groom with low income but who implements a bride kidnapping and a groom with higher income may demand the bride of same quality. This will incur an excess demand of brides of qualities in a certain range, and as a result, an excess supply of brides of qualities in another range. Assume grooms' income is normally distributed, and all the other parameters hold the same for the whole society, Figure 7 simulates the demand and supply of brides of different qualities.

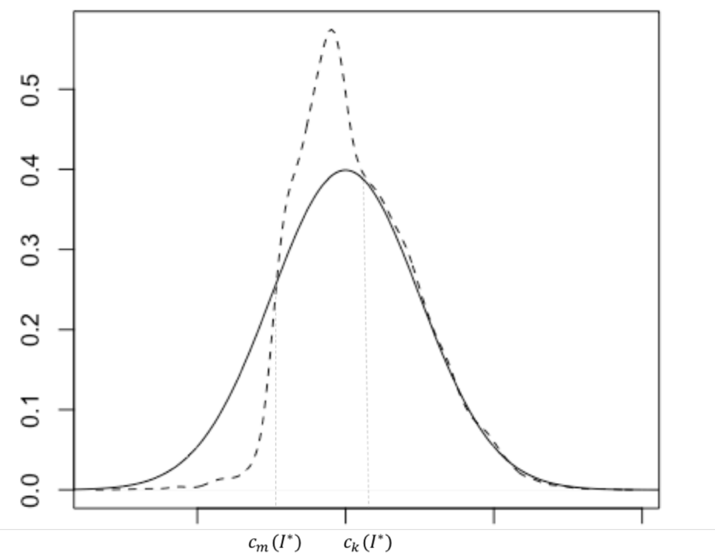


Figure 7 Demand and supply of brides of different qualities. (The full line is the density function of standard normal distribution that represents the supply of brides of different qualities and the dashed line is the demand of brides of difference qualities in case where bride kidnapping is allowed)

We can observe several interesting facts from Figure 7. First, we know there exists a cutoff level of income I^* at which a groom is indifferent between kidnapping a bride and not kidnapping a bride. Denote the quality of bride he would marry if he chooses not to kidnap as $c_m(I^*)$ and the quality of bride he would marry if he kidnaps as $c_k^*(I^*)$. From Figure 6, we have $c_m(I^*) < c_k(I^*)$. However, as his income increases, eventually he would choose to marry a wife with quality higher than $c_k(I^*)$. This implies that brides of quality higher $c_k(I^*)$ bear no risk of being kidnapping. As we can see in Figure 7, the demand and supply curves overlap if $c > c_k(I^*)$. Since we restrain Δc to be fixed, in other words, so long as the benefit of bride kidnapping decreases in income level, the brides from upper class not only have the power and ability to deter the bride kidnapping from happening, but also suffers lower (or no) risk of being kidnapped. Second, for brides of qualities in the range of $[c_m^*(I^*), c_k^*(I^*)]$, there are excess demand of brides. Anderson (2007) refers this phenomenon that the number of marriageable men and women are imbalanced as 'marriage squeeze'. The excess demand leads to rising bride price. From the perspective of bride or her family, this implies that in an institution where bride kidnapping is socially tolerated, they could receive a higher amount of bride price if she is lucky enough not to be kidnapped. Thus if the probability of being kidnapped is not unbearably high, brides in this middle range could benefit from an institution with bride kidnapping for higher bride price. This provides a possible explanation for why exposing to the risk of being kidnapped is somewhat rational for some young women and their families. Third, an excess supply of brides of low qualities happens as a result of excess demand in the middle class. This drives bride price of brides of quality lower than $c_m(I^*)$ down. This means that brides of quality in this range will receive less bride price not only because she is kidnapped but also due to the excess supply. The implication is that girls from the bottom of the society will be the group that suffers most.

But this is not the whole story. Grooms (both who kidnap and do not kidnap) who want to marry a wife of quality in the middle range of $[c_m^*(I^*), c_k^*(I^*)]$ would suffer a loss in their utilities as a result of rising bride price. Specifically, consider the groom who had been indifferent from kidnapping and not kidnapping. The rising bride price is equivalent to a decrease of the groom's actual income, in other words, the first-period budget constraint of groom will change to $I = s_1 + (c + \Delta BP) + \pi_y y_1$ (in case he does not kidnap) and $I = s_1 + (c - \Delta c + \Delta BP) + \pi_y y_1$ (in case he kidnaps). Consequently, U_m and U_k will change in terms of the expression y_m and y_k. Although the utilities in two cases both decrease, the utility of marrying through normal marriage, U_m decreases more fast than U_k[2]. Thus, the groom who had been indifferent from the choices will choose to kidnap now. This will change the demand again and lead to the next round of update. Similarly, as the bride price decreases in the bottom class (ΔBP is negative), the best strategy of grooms who wish to marry a bride of quality in this range may change to a normal marriage rather than bride kidnapping.

What could be an equilibrium in the marriage market where bride kidnapping is allowed? Becker (1981) describes the equilibrium of marriage market as a market that maximizes the total output. We have shown that such a market with the pattern of positive assortative mating is not likely to exist in our settings. Alternative definitions can be borrowed from Tertilt (2002) and Ambrus *et.al.* (2010). Roughly speaking, groom chooses the marriage strategy of either kidnapping or not kidnapping and chooses the quality of wife he would like to marry to maximize his utility; at the equilibrium, bride price makes the demand and supply for bride equal in each market. Is this equilibrium possibly achieved? There are two different situations. First, consider a closed society where working opportunities outside the community do not exist. We know that so long as the quality of bride whom a groom would like to marry is not continuous in his income level, there would be excess demand and supply. In order to make the excess and supply disappear, only two equilibria are possible: either $\Delta c = 0$, which means no one kidnaps, or $\Delta c = \Delta BP$ and everyone kidnaps, but the net effect is as if there is no bride kidnapping. The current trend in Kyrgyzstan seems to the second case. On the one hand, there is only a small proportion of grooms report their incentive for abducting a bride as 'cannot afford the bride price' (Kleinbach, 2005); on the other hand, we witness a rising frequency of bride kidnapping. A possible economic explanation for these two seemingly contradicting observations could be that the institution of bride kidnapping is shifting from an imbalanced situation in which a small proportion of grooms uses it to lower the wedding cost like what shows in Figure 7 to a new equilibrium that everyone kidnaps but bride kidnapping only severs as a symbolic practice. That's how bride kidnapping is invented as a tradition. Meanwhile, in the equilibrium grooms maximize their utilities. But if $k > k^*$, we have proved that kidnapping is not rational for groom with income higher than I^*. Therefore, in this equilibrium that everyone kidnaps, we need to have $k < k^*$ (or all grooms' income are below I^*). This matches the reality in Kyrgyzstan, where the reputational concern of bride kidnapping is getting weaker and sometimes young people even believe that kidnapping a bride demonstrates their courage.

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[2] The proof is in Appendix C.

The second situation is when working opportunities outside the community is available. The rising bride price lowers the quality of brides the grooms could have married thus makes both a normal marriage and bride kidnapping less attractive. A proportion of grooms who demand a wife of quality in range $[c_m^*(I^*), c_k^*(I^*)]$ may choose to work abroad and exit the marriage market for a while. As observed in colonial Africa, higher bride price and excess demand of wives lead to outmigration of eligible grooms (Anderson, 2007). In this situation, bride kidnapping could exist in the marriage institution, but there is still excess supply of low-quality wives. They are still the victims of the bride kidnapping.

B. Marriage Types

Although we focus on bride kidnapping, different types marriages coexist in Kyrgyz society, including love marriage, arranged marriage and kidnapped marriage. In our model, if the elder and younger generation both agree to get married at $t = 1$, and if they are rich enough or they care enough about their reputation so that they would not implement bride kidnapping, the marriage can be categorized as an arranged marriage, since the elder generation has the rights to decide who he should marry. On the other hand, bride kidnapping can happen in two cases in our model. First, if the groom's family is relatively poor and cares less about its reputation while they want their son to get married at $t = 1$, they would implement a bride kidnapping. Second, we have proved in Proposition 1 that the elder generation has the incentive to coerce the younger generation for an early marriage and also proved in Proposition 2 that the elder generation is apt to initiate a bride kidnapping for their son to force him to marry. In this case, the elder generation uses bride kidnapping as a tool to force an early marriage for their son who would prefer working for an initial period. In other words, the younger generation groom wants to marry at $t = 2$ but the elder generation wants him to get married at $t = 1$. But there can be the third type of bride kidnapping, a pseudo-kidnapping which is used as a form of elopement, as addressed in Borbieva (2012). If the elder generation for some reason disapproves the young couple's marriage, the groom and the bride can connive a bride kidnapping to get married. It is straightforward to incorporate this situation into our model.

In our previous discussion, we regard differing preferences between the elder and younger generation as being reflected in their different weights on the utility of having offspring. This is the heterogeneous preference in the same period. Here we consider another type of heterogeneity: idiosyncratic preferences over time. Weighting less on offspring notwithstanding, when the younger generation becomes the elder generation, they will have the same preferences as their parents. The life cycle continues over the generations. Formally, we assume that people will be present-biased between adjacent periods while treat periods far way equally. The parents, as they are older, will make decision for their child as if they are one period prior. This discount structure is very similar to quasi-hyperbolic discounting suggested in Diamond and Köszegi (2003), so we call it intergenerational quasi-hyperbolic discounting. Figure 8 shows the idea.

younger generation				$\gamma\delta$		δ	
elder generation	0	$\gamma\delta$	1	δ	2	δ	3

Figure 8 Intergenerational Quasi-Hyperbolic Discounting

In Figure 8, δ is the discount factor as before, while γ represents the bias towards present. For simplicity, this time we will set equal weights to the utility from child for both the elder and younger generation while applying the intergenerational quasi-hyperbolic discounting. The younger generation's intertemporal utility maximization problem in this case is

$$\max_{y_1,y_2,y_3,c,q,s_1,s_2} u(y_1) + \gamma\delta[u(y_2) + v(1, qc)] + \gamma\delta^2[u(y_3) + v(1, qc)] + k \ln c$$

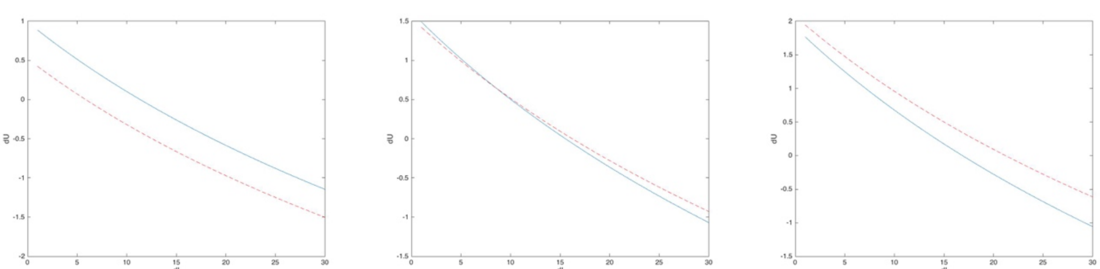
$$\begin{aligned} s.t.\ \ I &= s_1 + c + \pi_y y_1 \\ s.t.\ I + rs_1 &= s_2 + \pi_y y_2 + \pi q \\ s.t.\ I + rs_2 &= \pi_y y_3 \end{aligned} \tag{17}$$

if they choose to marry at $t = 1$ and

$$\max_{y_1,y_2,y_3,c,q,s_1,s_2} u(y_1) + \gamma\delta u(y_2) + \gamma\delta^2[u(y_3) + v(1, qc)] + \gamma\delta k \ln c$$

$$\begin{aligned} s.t.\ \ I &= s_1 + \pi_y y_1 \\ s.t.\ I + \Delta I + rs_1 &= s_2 + \mathrm{c} + \pi_y y_2 \\ s.t.\ I + rs_2 &= \pi_y y_3 + \pi q \end{aligned} \tag{18}$$

if they choose to marry at $t = 2$. $\gamma < 1$ represents the present biasness. These problems will yield similar solutions to (4). The solutions differ from (4) in that the younger generation will be less sensitive to the future utility change including the potential ΔI. Therefore, if the concern of family reputation is strong enough, the elder generation will hope that their son will work and earn more money so that they can have a better daughter in-law who reflects the wealth and power of the family. They may reject their child's request to marry an ordinary woman who he loves at $t = 1$. The young couple then have an incentive to use collusive bride kidnapping to avoid the elder generation's opposition. Figure 9 shows all possible situations with different level of concern in their family reputation.



(a) $k = 0$ (b) $k = 1$ (c) $k = 1.5$

Figure 9 Working decision under intergenerational quasi-hyperbolic discounting

Similar to Figure 1, the dashed line in Figure 9 represents the difference between the younger generation's utility of marrying at $t = 1$ and $t = 2$, while the full line represents the elder generation. If they do not care about family reputation, the younger generation will be more inclined to working opportunities. If family reputation does matter, however, as in Figure 9(b) and 9(c), the elder generation has an incentive to send their son to work against his will under intergenerational quasi-hyperbolic discounting. They may not agree with their son's desire to marry for love at $t = 1$. Bride kidnapping then becomes the young couple's option to defend their love from parental opposition.

IV. Conclusion

The preceding pages provide a set of economic explanations for bride kidnapping in Kyrgyzstan. Our explanation is based on Gary Becker's model of family fertility and consumption decision. In the paper, bride kidnapping is primarily viewed as a way of marrying a woman at lower cost. We have demonstrated that, the elder generation has the incentive to implement a bride kidnapping for their son in order to have grandson and granddaughter earlier, even if this may be against their son's will. This is a necessary condition for bride kidnapping to exist because in Kyrgyz society, especially in rural areas, it is the elder generation who controls the social norm. Thus bride kidnapping must be a rational choice for them. We have also shown the conditions under which bride kidnapping is rational for grooms. In case working opportunities outside the communities is not lucrative or scares, bride kidnapping provides a special marriage institute that allows grooms to marry a better wife without postponing his marriage.

Although bride kidnapping causes mental trauma and miserable life for some young Kyrgyz women, not all young women bear the risk of being kidnapped. Since men with high income would not kidnap a bride for marriage, women from upper class is not likely to be kidnapped – if the bride kidnapping does happen, she and her family would have ability to deter the inter-class marriage from happening. Furthermore, the institution of bride kidnapping generates excess demand for brides from the middle class, which pushes up the bride price. Brides from middle class would therefore possibly benefit from higher bride price, and thus have incentive to partially expose themselves to the risk of being kidnapped. On the contrary, excess supply of brides from the bottom of the society drives down the bride price while brides from the lower class is more likely to be kidnapped. They usually do not have the ability the prevent the bride kidnapping from happening. In Kyrgyzstan, most bride kidnapping occurs in countryside and 92% leads to marriage eventually.

The explanation as why bride kidnapping arose in Kyrgyzstan, but not in many other low-density nomadic societies, and has been preserved to this day, is beyond the scope of this paper. Since cultural tradition may appear as a mutation in some stage of history and will evolve over time, we regard many traditions as sustainable but not inevitable. The history of bride kidnapping is an instance of this kind of cultural tradition. It can be traced back to their nomadic ancestors while was forbidden in Soviet periods and then reemerged in its present form after the collapse of USSR. A cultural tradition, probably a trivial practice at the beginning, can be self-reinforced, as many Kyrgyz young people today become to believe bride kidnapping is their tradition since many people practice it. In our discussion, we provide a possible explanation of why bride kidnaping has been prevailing in the past twenty years while the real income of Kyrgyz people increases from the perspective of marriage market equilibrium. Bride kidnapping seems to transform from a way of lowering wedding cost to a symbolic practice. But this does not mean bride kidnapping is no longer a concern. Non-consensual bride kidnapping causes welfare loss of young women which we have not taken into account in out framework, but it does matter.

Future research of bride kidnapping may adopt a dynamic approach to analyze how bride kidnapping is invented in the past century. In a certain era people adopted this tradition to lower the wedding cost; but this institution persists even after financial concern is not a big issue. This suggests that the evolution of this special marriage institution is somewhat path dependent. Literature on technology and culture diffusion may shed lights on this direction, see David(1985), Ruttan (1997), Mahoney (2000). Also, a two-sided marriage market equilibrium may be preferable if both the groom's family and bride's family's utilities are taken into consideration. In studying the intergenerational conflict of marriage timing, a family bargaining model may be favorable, as in McElory (1980), Browning, Martin and Chiappori (1998).

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Appendix

A. Proof of Lemma 1

We have $\Delta U_k < 0$ when $\Delta c = 1$; meanwhile, as Δc goes to infinity,

$$\lim_{\Delta c\to\infty}\Delta U_k = \lim_{\Delta c\to\infty}[1+k+(1+2\alpha\beta)(\delta+\delta^2)]\ln\frac{\left(1+\frac{1}{r}+\frac{1}{r^2}\right)I}{\left(1+\frac{1}{r}+\frac{1}{r^2}\right)I+\Delta c}+k\ln\Delta c$$
$$=[1+k+(1+2\alpha\beta)(\delta+\delta^2)]\ln\left(1+\frac{1}{r}+\frac{1}{r^2}\right)I$$
$$+\lim_{\Delta c\to\infty}\ln\frac{(\Delta c)^k}{\left[\left(1+\frac{1}{r}+\frac{1}{r^2}\right)I+\Delta c\right]^{[1+k+(1+2\alpha\beta)(\delta+\delta^2)]}}.$$

The first term is a constant, and the second term goes to minus infinity due to the fact that $k<1+k+(1+2\alpha\beta)(\delta+\delta^2)$, so $\lim_{\Delta c\to\infty}\Delta U_k\to-\infty<0$. Therefore, if the maximum value of ΔU_k is greater than zero, by Mean Value Theorem, there exists two cross points of ΔU_k and the horizontal axis. To prove ΔU_k^* can be greater than zero as long as k is larger enough, notice the derivative of ΔU_k^* with respect to k:

$$\frac{\partial\Delta U_k^*}{\partial k}=\ln\frac{\left(1+\frac{1}{r}+\frac{1}{r^2}\right)Ik}{1+k+(1+2\alpha\beta)(\delta+\delta^2)}.$$

Since $\left(1+\frac{1}{r}+\frac{1}{r^2}\right)I>1$, this derivative is increasing in k and $\frac{\partial\Delta U_k^*}{\partial k}>0$ when $\mathrm{k}>\frac{1+(1+2\alpha\beta)(\delta+\delta^2)}{\left(1+\frac{1}{r}+\frac{1}{r^2}\right)I-1}$. Let $\mathrm{k}\to\infty$, we have

$$\lim_{k\to\infty}\Delta U_k^* = \lim_{k\to\infty}[1+k+(1+2\alpha\beta)(\delta+\delta^2)]\ln\frac{1+(1+2\alpha\beta)(\delta+\delta^2)}{1+k+(1+2\alpha\beta)(\delta+\delta^2)}+k\ln\Delta c^*$$
$$=[1+(1+2\alpha\beta)(\delta+\delta^2)]\ln[1+(1+2\alpha\beta)(\delta+\delta^2)]+\lim_{k\to\infty}k\ln\left(1+\frac{1}{r}+\frac{1}{r^2}\right)I$$
$$+\lim_{k\to\infty}\ln\frac{k^k}{[1+k+(1+2\alpha\beta)(\delta+\delta^2)]^{1+k+(1+2\alpha\beta)(\delta+\delta^2)}}.$$

The first term is a constant; the second term goes to infinity; and the third limit

$$\lim_{k\to\infty}\ln\frac{k^k}{[1+k+(1+2\alpha\beta)(\delta+\delta^2)]^{1+k+(1+2\alpha\beta)(\delta+\delta^2)}}$$
$$<\lim_{k\to\infty}\frac{k^k}{[1+k+(1+2\alpha\beta)(\delta+\delta^2)]^k}$$
$$=\lim_{k\to\infty}\frac{1}{\left[1+\frac{(1+2\alpha\beta)(\delta+\delta^2)}{k}\right]^k}\to e^{-(1+2\alpha\beta)(\delta+\delta^2)}.$$

Therefore, as $\mathrm{k}\to\infty$,$\Delta U_k^*\to\infty$ as well. The proves the lemma.

B. Proof of Lemma 2

Let $k \to \infty$ in

$$\Delta U_k = [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)] \ln \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I}{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c} + k \ln \Delta c,$$

we have

$$\lim_{k\to\infty} \Delta U_k = [1 + (1 + 2\alpha\beta)(\delta + \delta^2)] \ln \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I}{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c} + \lim_{k\to\infty} k \ln \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I \cdot \Delta c}{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c}.$$

Because $\frac{\left(1+\frac{1}{r}+\frac{1}{r^2}\right) I \cdot \Delta c}{\left(1+\frac{1}{r}+\frac{1}{r^2}\right) I + \Delta c} > 1$, then $\lim_{k\to\infty} \Delta U_k \to \infty$.

C. Proof of the Claim in Section IIIA

With the rising bride price ΔBP, the solution to the two maximization problems remain the same form but differ in the expression of y_1^m and y_1^k, where

$$y_1^m = \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I - \Delta BP}{\pi_y [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]}, \qquad y_1^k = \frac{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c - \Delta BP}{\pi_y [1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]}.$$

Therefore,

$$\frac{\partial U_m}{\partial \Delta BP} = \frac{\partial U_m}{\partial y_1^m} \cdot \frac{\partial y_1^m}{\partial \Delta BP} = -\frac{[1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]}{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I - \Delta BP},$$

$$\frac{\partial U_k}{\partial \Delta BP} = \frac{\partial U_k}{\partial y_1^k} \cdot \frac{\partial y_1^k}{\partial \Delta BP} = -\frac{[1 + k + (1 + 2\alpha\beta)(\delta + \delta^2)]}{\left(1 + \frac{1}{r} + \frac{1}{r^2}\right) I + \Delta c - \Delta BP}.$$

Clearly, $\left|\frac{\partial U_m}{\partial \Delta BP}\right| > \left|\frac{\partial U_k}{\partial \Delta BP}\right|$. This proves the claim.