

Marriage Traditions and Investment in Education: The Case of Bride Kidnapping

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- Bride kidnapping, called ala kachuu in Kyrgyz (literally: to take and run away), is the act of abducting a woman to marry her
- Extent of forced kidnapping: consensual (staged) vs. non-consensual
- Estimates of non-consensual kidnapping vary between 34% and 66% (Nedoluzhko and Agadjanian, 2015; Kleinbach et al., 2005)
- Bride Kidnapping is illegal (3-7 years of prison), but not enforced. Only 4,1% of women report kidnapping (Naumova, 2016)

- How does the threat of bride kidnapping affect the education of women?
- We are interested in the effect of the social institution of bride kidnapping on all young women at risk, not just those affected by kidnapping
- Highlight two opposing effects:
 - Expected returns to education are lower
 - Education reduces the probability of being kidnapped
- We also analyze how the enforcement of the law may affect traditional and non-traditional families differently

- ROI effect (Return on Investment)
There exists a high risk of kidnapping and an expectation that those who are abducted into marriage have less control within the household; investment in education will be reduced
- KNP effect (KidNapping Probability)
Young women may enroll in higher education to reduce their personal probability of being kidnapped:
 - women are less likely to be abducted while they are in school
 - migrating away from rural regions to urban centres (where kidnapping is rare) to attend universities
 - while in higher education, women may find a love match
 - the completion of higher education may signal her modernization to potential kidnappers

- We develop a simple two-period expected utility model to illustrate the two opposing effects of kidnapping risk on education investment:
 - When the ROI effect dominates, the risk of kidnapping reduces investment in education
 - When the KNP effect dominates, the risk of kidnapping increases investment in education
- We test the implications of the model using the Life in Kyrgyzstan (LiK) data
- The empirical results suggest that for the entire population, the ROI effect dominates
- Within the Kyrgyz community, there are identifiable groups for whom the KNP effect dominates.

Theoretical Model: Assumptions

We develop a simple two-period individual utility model

- The daughter is the decision maker in the household
- Households and regions are: traditional and non-traditional
 - traditional households in traditional regions;
 - non-traditional households in non-traditional regions;
 - traditional households in non-traditional regions;
 - non-traditional households in traditional regions.

Theoretical Model: Assumptions

Period 1: the daughter maximizes a life-time utility to choose whether to invest in education

Period 2: Following the first period, she is subject to a random kidnapping shock

- If she is not kidnapped, she enters a love marriage ($M=LM1$) for the second period
- If she is kidnapped, she must choose whether to accept or reject the kidnapping
- If she accepts, she spends her second period in a kidnapped marriage ($M=KM$)
- if she rejects, she spends her second period in a secondary love marriage ($M=LM2$)

Theoretical Model: Period 1

First period utility:

$$U_1 = U(C_i^1(E_i)), E_i = 0, 1$$
$$s.t. Y_{1i} + w_1(E_i)C_i^1 + p_e E_i$$
$$C_i^1 = \begin{cases} Y_{1i} + w_1 & \text{if } E_i = 0 \\ Y_{1i} - p_e & \text{if } E_i = 1 \end{cases}$$

where:

- $E_i = 0, 1$ is the education investment (choice variable)
- Y_{1i} = other household income
- w_1 = the first period wage
- p_e = the price of education

Theoretical Model: Period 2

- A random draw determines whether the daughter is kidnapped
- The daughters probability of being kidnapped:

$$\rho_{ij} = \begin{cases} \rho_T & \text{if } j = T, E_i = 0 \\ \rho_T(1 - \rho_E) & \text{if } j = T, E_i = 1 \\ \rho_{NT} & \text{if } j = NT, E_i = 0 \\ \rho_{NT}(1 - \rho_E) & \text{if } j = NT, E_i = 1 \end{cases}$$

where ρ_T and ρ_{NT} are regional probabilities of being kidnapped and ρ_E is a fixed proportion of decline in education if kidnapped

Theoretical Model: Period 2

Second period utility:

$$U^2 = U(C_i^2(E_i, r_j^M), K_i); M = LM1, LM2, KM$$

$$C_i^2 = \begin{cases} Y_{2i} + w_e & \text{if } M = LM1 \\ r_j^{KM}(Y_{2i} + w_e) & \text{if } M = KM \\ r_j^{LM2}(Y_{2i} + w_e) & \text{if } M = LM2 \end{cases}$$

where: The daughters control over second period household resources

- $r_j^{LM1} = 1$ in a love marriage
- $r_j^{KM} < 1$ in a kidnapped marriage
- $r_j^{LM2} < 1$ in a love marriage after rejected kidnapping
- in a traditional region $r_T^{LM2} < r_T^{KM} < 1$,
- in non-traditional region $r_{NT}^{KM} < r_{NT}^{LM2} < 1$

Theoretical Model: Period 2

- Second period utility is also affected by a $K_i = -K, +K$ an indicator of parents beliefs
- If the daughter is kidnapped, her second period utility increases if her accept/reject choice is consistent with her parents values falls if she makes a decision counter to her parents values
- The daughter will accept the kidnapping if her parents are traditional
- The daughter will reject the kidnapping if her parents are non-traditional

Theoretical Model: Results

The daughter chooses her education investment $E_i = 0, 1$, conditional on her household and region type, to maximize her expected utility:

$$\begin{aligned} U_{ij} = & U^1(C_i^1(E_i)) \\ & + \delta(1 - \beta_{ij}(E_i))U_{ij}^{2,LM1}(C_i^2(E_i)) \\ & + p_{ij}(E_i)\text{Max}(U_{ij}^{2,LM2}(C_i^2(E_i), r_j^{LM2}), K_i), U_{ij}^{2,KM}(C_i^2(E_i), r_j^K M), K_i)) \end{aligned}$$

We use backwards induction to solve the model in a logarithmic form and compare the decisions of the four combinations of households and regions:
 $h, j = (T, T), (NT, NT), (T, NT), (NT, T)$

Theoretical Model: Results

The Decision to Accept or Reject the Kidnapping

Condition 1: Reject kidnapping if: $\ln\left(\frac{r_j^{LM2}}{r_j^{KM}}\right) > 2K_i$

- Case 1 If family tradition is irrelevant ($K_i = 0$), daughters would reject kidnappings in non-traditional regions and would accept kidnappings in traditional regions
- Case 2 In the two complementary cases, the daughter will always accept kidnappings in traditional family and reject kidnappings in non-traditional family
- Case 3
 - Traditional household ($K_i > 0$) resides in a non-traditional region ($r^{LM2} > r^{KM}$), the daughter will reject the kidnapping only if the higher control over resources in the secondary love marriage compensates for the disutility from rejecting the kidnapping
 - Non-traditional household ($K_i < 0$) resides in a traditional region ($r^{LM2} < r^{KM}$), a daughter will only reject the kidnapping if her disutility outweighs the lower resource control in a secondary love marriage

Theoretical Model: Results

Choosing Optimal Education

In the absence of kidnapping the decision maker would invest in education if $ROI \geq 0$

But in the presence of kidnapping:

- Condition 2a: If a kidnapping would be accepted, invest in education if $ROI \geq \delta\rho_j\rho_E \ln(r_j^{KM} + K_j)$
- Condition 2b: If a kidnapping would be rejected, invest in education if $ROI \geq \delta\rho_j\rho_E \ln(r_j^{LM2} - K_i)$

Theoretical Model: Implications

- The effect of reducing the probability of kidnapping on optimal education is ambiguous
- Very traditional and very non-traditional households have lower education investment, compared to neutral households, especially at high and low kidnapping probability

- Data from the Life in Kyrgyzstan (LiK) Survey (2010-2013)
- Sample: all unmarried 15-26-year-old daughters living with their parents in single- or two-parent households
- We chose the last year the daughter was observed to increase the proportion of daughters who respond to the individual interviews themselves
- The full sample includes 768 observations of Kyrgyz women and 152 observations of Uzbek women

Empirical Model

- We estimate :

$$E_i = f(X_i, Z_h, Q_j)$$

- Where E_i is either the probability of the daughters school enrollment or the last level of education observed for daughter i ,
- X_i is a vector of the daughters characteristics
- Z_h are household characteristics, including household traditionality and ethnicity
- Q_j are characteristics of the region j , including the prevalence of bride kidnapping
- We interact the regional prevalence of bride kidnapping with the indicator for Kyrgyz ethnicity to identify the effect
- Controls include: age and birth order of the woman, if parents have a university degree and if they work in agriculture, urban or rural residence, and house or apartment ownership dummies

Data: Descriptive Statistics

	Total sample		Kyrgyz only	
	Kyrgyz	Uzbek	Traditional	Non-Traditional
Dependent variables:				
School enrollment	0.74 (0.44)	0.55 (0.50)	0.74 (0.44)	0.75 (0.43)
Level of education:				
Below Secondary	35.27	52.67	37.21	32.63
Secondary	50.74	43.33	50.13	51.58
Technical	6.10	2.00	6.98	4.91
University	7.89	2.00	5.68	10.88
Observations	768	152	541	317

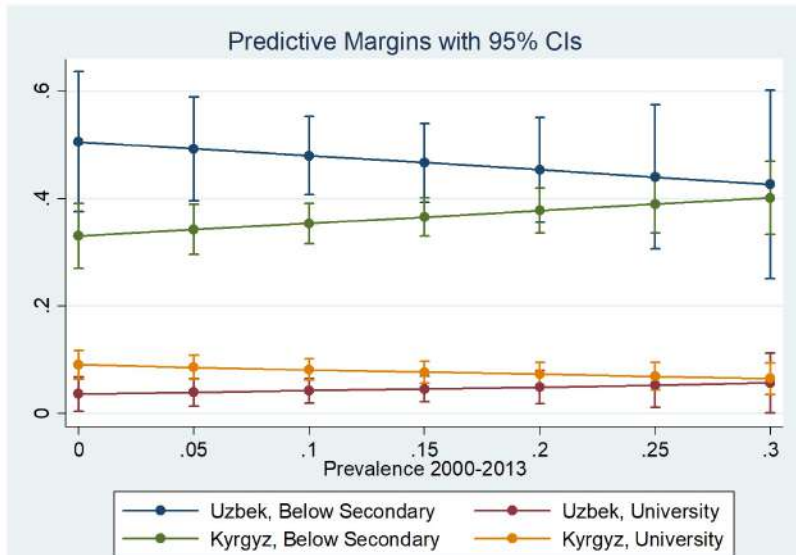
Data: Descriptive Statistics

	Total sample		Kyrgyz only	
	Kyrgyz	Uzbek	Traditional	Non-Traditional
Independent variables:				
Prevalence 2000-2013	0.13 (0.09)	0.12 (0.08)	0.14 (0.09)	0.11 (0.09)
Prevalence 1980-1990s	0.15 (0.11)	0.10 (0.05)	0.17 (0.12)	0.12 (0.09)
Bride Kidnapping Index	-2.38 (1.62)	-1.72 (2.05)	2.27 (0.87)	-2.92 (1.04)
Age	19.52 (3.12)	19.13 (3.06)	19.43 (3.11)	19.65 (3.12)
Birth order	1.99 (1.01)	1.88 (0.91)	2.00 (1.05)	1.97 (0.96)
Urban	33.85	42.11	25.72	45.54
Mother university education	20.18	5.51	17.11	24.52
Father university education	17.45	2.33	14.14	22.76
Mother in agriculture	39.12	51.33	42.73	34.38
Father in agriculture	42.71	38.88	47.01	36.00
House ownership				
not own	1.56	1.32	0.22	3.47
own: inherited	21.48	15.79	22.39	20.19
own: bought or built	76.95	82.89	77.38	76.34
Observations	768	152	541	317

The impact of kidnapping prevalence on the probability and the level of education enrollment, Kyrgyz vs. Uzbek

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	Probability of Enrollment		OLS	Logit		Level of Education	
	Estimated Coefficients	Marginal Effects	Logit	Estimated Coefficients	Marginal Effects	Logit	Estimated Coefficients	OLS
		Uzbek	Kyrgyz		Uzbek	Kyrgyz		
Kyrgyz	0.23*** (0.08)	–	0.18*** (0.04)	0.38*** (0.11)	–	0.14*** (0.04)	0.31** (0.13)	0.15 (0.18)
Prevalence 2000-2013	0.50 (0.53)	0.50 (0.58)	-0.00 (0.20)				0.24 (0.86)	
Kyrgyz × Prevalence 2000-2013	-0.48 (0.57)						-0.83 (0.92)	
Prevalence 1980-1990s				1.70* (0.96)	1.50* (0.83)	-0.17 (0.14)		-1.26 (1.55)
Kyrgyz × Prevalence 1980-1990s				-1.85* (0.97)				0.68 (1.56)
Observations	547	547	547	547	547	547	483	483

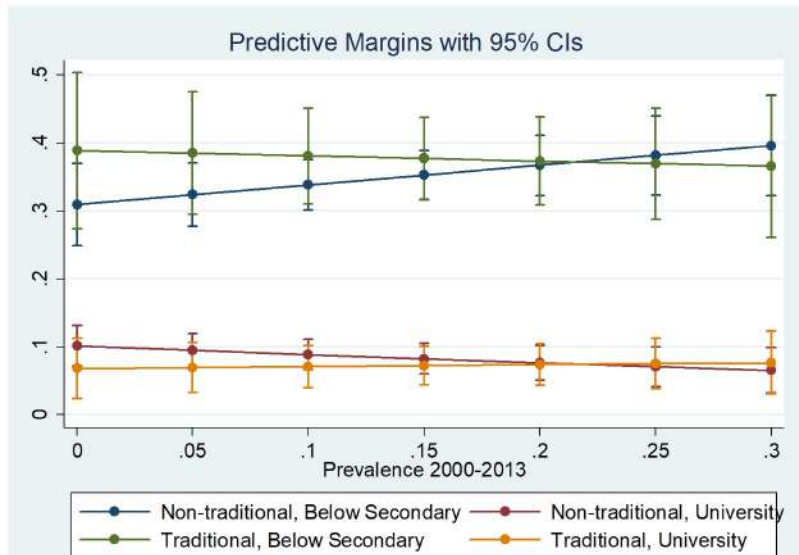
Predictive Probabilities of High and Low Education by Kidnapping Prevalence, Kyrgyz and Uzbek



The impact of family traditionality on the probability and the level of education enrollment, Kyrgyz only

	(1)	(3)		(4)	(5)	(6)	(7)	(8)
	OLS	Probability of Enrollment		OLS	Logit		Level of Education	
	Estimated Coefficients	Marginal Effects	Marginal Effects	Estimated Coefficients	Marginal Effects	Marginal Effects	Estimated Coefficients	OLS
		BKI=0	BKI=4		BKI=0	BKI=4		
BKI	0.02 (0.02)	0.02 (0.01)	0.02* (0.01)	0.03 (0.02)	0.02 (0.01)	0.02* (0.01)	0.05* (0.03)	0.03 (0.03)
Prevalence 2000-2013	0.22 (0.35)	0.18 (0.36)	0.05 (0.29)				0.25 (0.59)	
BKI × Prevalence 2000-2013	-0.04 (0.12)						-0.33* (0.20)	
Prevalence 1980-1990s				0.09 (0.27)	0.09 (0.27)	-0.25 (0.22)		-0.12 (0.47)
BKI × Prevalence 1980-1990s				-0.08 (0.10)				-0.17 (0.17)
Observations	459	459	459	459	459	459	396	396

Predictive Probabilities of High and Low Education by Kidnapping Prevalence, Kyrgyz only



The impact of family and regional traditionality on the probability and the level of education enrollment, Kyrgyz only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Probability of Enrollment			Level of Education			
	OLS	Logit	OLS	Ordinal Logit Predicted Probabilities			
	Coeff.	ME	Coeff.	Below Secondary	Secondary	Technical	University
Low trad HH in medium BK (base)							
Low trad HH in low BK	0.10 (0.08)	0.08 (0.07)	0.16 (0.14)	-0.05 (0.07)	0.02 (0.03)	0.01 (0.01)	0.02 (0.03)
High trad HH in low BK	0.15 (0.09)	0.09 (0.07)	0.24 (0.15)	-0.11* (0.07)	0.05* (0.03)	0.01 (0.01)	0.05 (0.04)
High trad HH in medium BK	-0.05 (0.05)	-0.06 (0.04)	-0.06 (0.08)	0.02 (0.04)	-0.01 (0.02)	-0.00 (0.00)	-0.01 (0.02)
Low trad HH in high BK	0.13* (0.06)	0.11* (0.06)	-0.09 (0.11)	0.01 (0.05)	-0.01 (0.03)	-0.00 (0.01)	-0.01 (0.02)
High trad HH in high BK	0.00 (0.06)	-0.02 (0.05)	-0.02 (0.10)	0.02 (0.05)	-0.01 (0.02)	-0.00 (0.01)	-0.01 (0.02)
Observations	459	459	396	396	396	396	396

- Overall, the effect of kidnapping risk on education is negative
- There is evidence that for some groups of women, increasing years of daughters education provides a hedge against the probability of forced kidnapping and the relationship between kidnapping risk and education is positive
- Policies aimed at improving the legal enforcement of the kidnapping laws should be coupled with policies aimed at maintaining investment in the education of young women
- Our research suggests that these policies will be most effective if aimed at traditional households in non-traditional regions, and non-traditional households in traditional regions