A Note on Bride Kidnapping and Labour Supply Behaviour of Kyrgyz Women

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Abstract:

Using data from the 2011 and 2016 Life in Kyrgyzstan surveys, we examine Kyrgyz women's labour supply elasticities at the extensive margin. We use Heckman's two-step approach to predict earnings for the non-participating women and then use these predictions to estimate the participation equation. We find that women's labour supply decision is not influenced by their earnings. We also show that there exists a significant gap in employment propensities among ethnic Kyrgyz women in consensual or arranged marriages compared to women in kidnapped-based marriages. This finding suggests that the practice of bride abduction adversely affects women's probability of employment and might have negative consequences on their economic well-being.

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1. Introduction

Women's labour supply elasticities, both at the extensive (employment status) and intensive (hours worked) margins, have been the subject of several empirical studies and therefore are well-researched (e.g. Blundell et al., 2011). However, these efforts were mainly directed at analysing elasticities in higher-income countries where data is available and there have been limited attempts at evaluating women's labour supply responses in the poorest states of the Central Asia region where data has just recently becoming available.

The greater participation of women in labour markets has a broader importance for economic development, as it is closely related to women's empowerment and the benefits that women in employment bring to themselves and their families. In this respect, Kyrgyzstan makes an interesting case, since it is a country where marriage involving bride kidnapping is a widespread practice that still persists (Becker et al., 2017). This marriage custom may have a bearing on Kyrgyz women, in terms of their employment participation, and therefore, we wish to examine their participation elasticities in detail, using a Heckman correction procedure.

We rely on exclusion restrictions to achieve identification, including a variable – namely forced marriage through bride kidnapping – which we believe captures those women who come from more traditional families and in general may be more restricted in joining the labour force. Furthermore, we conduct a decomposition analysis which helps to explain the differences in participation propensities between Kyrgyz women in love or arranged marriages and women who were abducted for marriage. We hope to contribute to the understanding of individual and economic factors that shape the decision of women to enter employment in the poorer Central Asian economies. We wish to note, however, that there are wide inter-country variations in the magnitude of participation elasticities and there exists some debate over the size of elasticity used in the setting of economic policy (Bargain and Peichl, 2016).

The basic insight that we believe emerges from our research, is that the labour supply decision at the extensive margin does not depend on women's labour income, and that marriage practices come into play in this decision. For this reason, we argue that policy efforts aimed at increasing labour force participation (LFP) of ethnic Kyrgyz women need to focus especially on those women whose circumstances are not accommodating towards participation in the labour market. The paper is organised as follows: Section 2 gives a brief overview of the Kyrgyz economy and marriage customs, Section 3 reviews some of the literature on labour supply elasticities, Sections 4 presents details of the selected methodology, Section 5 describes the data, Section 6 reports the results, and Section 7 concludes the paper.

2. Background

Kyrgyzstan is a lower-middle-income country with a population of 6.2 million which heavily relies on remittances of its migrant workers – a third of the country's GDP in 2017 was comprised of such transfers; the headcount poverty rate averaged 33% between 2000-2016

(World Bank, 2019). Labour participation rate of women decreased from 55% in 2000 to 48% in 2018 and remains lower than in many transition economies (World Bank, 2019). The size of the gender gap in LFP significantly widened during the 2000s and remained well above the average for Eastern Europe and Central Asia after 2010 (EBRD, 2015: Figure 1). There are of course several possible explanations for this negative trend, including the persistence of discriminatory social norms (Muldoon and Casabonne, 2017), legal barriers (EBRD, 2015), and women's traditional roles that involve housework and caring for their family (Barrientos and Kudebayeva, 2015: 8).

We can add another factor that might have contributed to the decline in the LFP of women, namely, bride kidnapping. In the post-Soviet era, the act of *kyz ala kachuu* (bride capture), as it is known in Kyrgyzstan, is a widespread practice and involves the ethnic Kyrgyz, even though it is prohibited by Kyrgyz criminal law and forbidden in Islam (Kleinbach and Salimjanova, 2007). Interestingly, the authors also report that the practice of kidnapping has little to do with Kyrgyz traditional customary law (*adat*) and that non-consensual kidnapping was an infrequent occurrence prior to the Soviet period. Some post-Soviet studies indicate that as many as half of marriages among the ethnic Kyrgyz involved bride abduction (Kleinbach, 2003), and often, as reported by Muldoon and Casabonne (2017: 6), the kidnapped brides were raped and, after being 'physically and psychologically coerced to submit', had little choice but to marry their abductor. The practice is perceived as 'a positive cultural identity marker denied under Soviet rule' (Handrahan, 2004: 208) and appears to be geographically widespread (Werner, 2009). Evidence presented in Nedoluzhko and Agadjanian (2015: 869) shows that one-third of all marriages of Kyrgyz women were the result of kidnappings, with considerable variations across marriage cohorts.

It should be acknowledged that the available data are not suitable for assessing the dynamics of bride kidnapping in Kyrgyzstan. For instance, the data set used by Nedoluzhko and Agadjanian (2015) is not nationally representative. Yet it is reasonable to suppose that the act of bride capture has evolved over time in a coercive direction, as opportunities for gender mingling that existed in the Soviet period (e.g. co-educational Komsomol activities) have narrowed in the post-Soviet period and as a result, more natural courtship has become less common. In other words, there was less kidnapping of strangers for marriage in the Soviet period, and when it occurred, it would likely have been relatively more consensual. It is also reasonable to argue that the practice of forcing a girl into a car with a group of young men also would have been less common due to the low density of private car ownership in the Soviet Kyrgyzstan.[1]

3. Literature Review

Estimations of women's labour supply responses to the changes in wages or income show considerable variations in terms of the size of the elasticities, ranging from 0.04 to 1.5 for married women across the EU countries (Bargain and Peichl, 2016: Table 1). Using data from

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[1] We are grateful to an anonymous referee for suggesting these possible explanations to us.

the Survey of Income and Program Participation, Kimmel and Kniesner (1998: Table 1) report employment elasticities, respectively, of 2.41 and 1.85 for single and married women in the US. Empirical evidence from transition economies show that participation elasticities for women are 0.06 percentage points in the Czech Republic (Bicáková et al., 2008: 26), between 0.01 and 0.02 in Russia (Klepikova, 2016: Table 3) and that the wage elasticities are larger for married (0.183) than single (0.113) women in Hungary (Benczur, 2014: Table 4), but not too dissimilar between single (0.125) and married women (0.104) in Slovakia (Siebertova et al., 2015: Table 3). And in Belarus, the elasticities of female labour supply with respect to their own wages were low in magnitude (less than 5% following an increase of 10% in wages), as reported by Pastore and Verashchagina (2008: 12).

For Kyrgyzstan, we observe from the related strand of literature that the presence of a seasonal (permanent) migrant in the household raises (lowers) the probability of female LFP (Paul, 2018), that women living in migrant-sending families tend to participate more in unpaid work, mostly in labour-intensive agricultural activities (Karymshakov and Sulaimanova, 2017), and co-residence with parents or in-laws has no significant effect on women's labour supply but raises the time spent on the care for the elderly (Landmann et al., 2018). Empirical evidence from Tajikistan concerning women's employment reported in Abdulloev et al. (2014), using data from the 2007 World Bank Living Standard Measurement Survey, shows that having a vocational qualification or a degree raises the probability of working for females and that being head of the household also has a positive effect on female participation whilst having a current migrant relative is statistically insignificant.

4. Empirical Framework

We apply a three-step estimation procedure to the data. We run the Heckman (1979) two-step procedure to estimate the LFP (first step) equation and the earnings (second step) equation for the working women only. We define working and non-working women based on their hours of work. Specifically, the latent earnings equation is:

$$w_i = X_i\alpha + \varepsilon_i \tag{1}$$

where earnings are observed for participating women only. Thus, $E(w_i|X_i, \text{employed}) = X_i\alpha + E(\varepsilon_i| \text{employed})$.

Selection equation is expressed as follows:

$$p_i = Z_i\beta + u_i \tag{2}$$

We observe only an indicator variable (employment status) and hence earnings are observed if employment status satisfies $p_i \geq 0$. Selection into employment depends on Z_i and u_i. Hence, if the woman is employed, we can rewrite: $E(w_i|X_i, u_i > -Z_i\beta) = X_i\alpha + E(\varepsilon_i|u_i > -Z_i\beta)$.

The second stage estimation is expressed as follows:

$$E(w_i|X_i, u_i > -Z_i\beta) = X_i\alpha + \frac{\sigma_{\varepsilon u}}{\sigma_u}\frac{\phi(Z_i\beta)}{\Phi(Z_i\beta)} \tag{3}$$

where the $\frac{\phi(Z_i\beta)}{\Phi(Z_i\beta)}$ is the inverse Mill's ratio.

For the non-working women and for women who have positive hours but for whom there is no earnings data, we obtain the predicted level of earnings.[2] We use two variables to achieve identification (that is, used in Z_i but excluded from X_i), including forced marriage through kidnapping – which we believe captures those women who come from more traditional families and in general may be more restricted in joining the labour force. The other variable used for identification is mother's marriage history. That is, we identify whether a woman's mother was kidnapped to marry – a proxy for conservative attitudes towards women's employment outside the home. Such a variable is a useful conservatism indicator, allowing us to identify the social forces by which women's labour force participation may be affected.

In the final third step, the structural probit is estimated both for working and non-working women to obtain participation elasticities for all women. We then use Yun's (2008) method to decompose the difference in the average likelihood of participation between the two groups of married women (non-kidnapped and kidnapped, denoted as *NK* and *K* respectively). That is, we decompose the difference in the average likelihoods of LFP (supressing individual subscripts) as follows:

$$\overline{LFP}_{NK} - \overline{LFP}_K = \left[\Phi(X_{NK}\beta_{NK}) - \overline{\Phi(X_K\beta_{NK})}\right] + \left[\overline{\Phi(X_K\beta_{NK})} - \overline{\Phi(X_K\beta_K)}\right] \qquad (4)$$

$$\overline{LFP}_{NK} - \overline{LFP}_K = \sum_{v=1}^{k} W_{\triangle X}^v \left[\Phi(X_{NK}\beta_{NK}) - \overline{\Phi(X_K\beta_{NK})}\right] + \sum_{v=1}^{k} W_{\triangle \beta}^v \left[\overline{\Phi(X_K\beta_{NK})} - \overline{\Phi(X_K\beta_K)}\right] \qquad (5)$$

where the gap is decomposed in terms of differences in endowments (the first term in square brackets) and characteristics (the second term in square brackets).

The coefficient weights, $W_{\triangle X}^v = \frac{(\bar{X}_{NK}^v - \bar{X}_K^v)\beta_{NK}^v}{(\bar{X}_{NK} - \bar{X}_K)\beta_{NK}}$ and $W_{\triangle \beta}^v = \frac{\bar{X}_K^v(\beta_{NK}^v - \beta_K^v)}{\bar{X}_K(\beta_{NK} - \beta_K)}$, are obtained from the normalised equation for LFP and reflect the contribution of the *v*th variable to the linearisation of the two portions (see Powers et al., 2011: 560). It is important to note that the supports of the distributions of the observable characteristics might not completely overlap. Thus we use the exact matching procedure in order to select two sub-samples of non-kidnapped and kidnapped married women and then apply the non-linear decomposition method described above to the matched sample. The matching algorithm follows the method proposed by Nopo (2004: 10).

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[2] We thank an anonymous referee for bringing the latter category of women to our attention.

5. Data

We use data from the second wave of the nationally and regionally representative Life in Kyrgyzstan (LIK) survey, collected between September and November of 2011. This wave interviewed 8,066 adults in 2,863 households and covers a very wide range of topics, but it was carried out principally for the purpose of providing data for the analysis of well-being and behaviour of individuals and households. The 2011 LIK is the most comprehensive wave in terms of women's background and fertility; no new sample has been added in the subsequent waves. We use two dependent variables for our estimations: log of hourly earnings and LFP (a binary categorical). The sample is restricted to ethnic Kyrgyz women of working age (17 to 58), and we also exclude some of the non-working women (e.g. retirees, students, and sick). Women who reside in Bishkek were also excluded, since there is almost no kidnapping in that city.[3] Using information from the 2016 LIK we identify women whose mothers were also kidnapped. Our final sample consists of 1,673 ethnic Kyrgyz women, 933 of whom are participating and among these women, 624 women report both positive hours worked and earnings and 309 report positive hours but no earnings. Table 1 details our final sample.

Table 1 here

6. Results

The marginal effects of estimating the first stage (probit) regression of the Heckman model are shown in Table 2. We find a strong negative relationship between the two marriage practice identifiers (*Kidnapped* and *Mother kidnapped*) and probability of working. For example, women who were kidnapped as brides have a 10% lower probability of participation, whilst mother's kidnap-based marriage augments the probability of not working by 8%. We now examine the estimated results of the earnings equation, that is, the second stage of the procedure. Only a woman's education and age were found to have a significant (at the 5% level or above) effect on her labour earnings.

Table 2 here

Our estimates of the structural probit are set out in Table 3. The results show that the responsiveness of female labour supply at the extensive margin, with respect to labour earnings, is not significant. As argued by Bargain and Peichl (2016), the size of participation elasticities varies significantly across countries and time periods, with methodology also having an impact, and hence we do not attempt to weigh our results on a comparative scale. Yet, for Kyrgyz women, we observe both a low LFP rate as well as an insignificant employment elasticity. We also find that the probability of working is lower for married women and that the presence of a family member working abroad (*Migrant*) does not significantly affect female labour supply. More educated (at secondary technical and university levels) women are more likely to be working, whereas the age–participation relationship does not display the

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[3] We wish to thank an anonymous referee for this suggestion.

usual concave pattern. We also find positive regional effects, except for Naryn and Chuy oblasts, and that living in a large town positively affects participation.

Table 3 here

We now analyse the participation gap between women who were kidnapped before marriage and women who were married without kidnapping (love or arranged marriage). These estimates are given in Table 4. The gap in the average mean participation probability is 13 percentage points and is not in favour of those women who were kidnapped as brides – a result which had been expected, given strong causal influences of traditional values and social norms which prevent women from taking up employment (see EBRD, 2015). We find that differences in characteristics explain around 17% of the overall gap, whilst the rest is explained by the differences in returns to those characteristics (behavioural responses) – in other words, the participation gap between non-kidnapped and kidnapped married women is to a lesser extent driven by the group differences in endowments.

Table 4 here

We present the contribution of different variables to the explained part of the gap in Table 4. Our results show that the share of the explained part attributable to human capital (namely, university degree) is as much as 49%. It is worth emphasising that our detailed estimates of the endowment effect are invariant with respect to the choice of omitted category and the order in which we introduce our covariates – in other words, our results are path independent (see Fortin et al., 2010: 40-42). Finally, the weighted sum of each covariate's contribution to the overall coefficient component is significant at the 5% level.

We now restrict our decomposition analysis to the common support.[4] This is done by using the matching technique to create the control group of non-kidnapped married women who match the treated (kidnapped) group of married women. Decomposition based on the two sub-samples of married women is presented in Table 5. The two groups of women were matched, and yet we find that the factors that determine the unexplained part are still present in our decomposition estimates based on matching.

Table 5 here

6. Conclusion

Labour supply elasticity of ethnic Kyrgyz women was analysed in this paper. The findings are relevant to understanding the obstacles to gender equality and may be helpful for policy

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[4] We are grateful to an anonymous referee for this suggestion.

analysis. Our empirical findings show that the young and less educated are less likely to work and that having a migrant member of the household working abroad doesn't affect married women's participation. These results are similar to the evidence reported in Tajikistan, although we must note that our analysis cannot be directly compared because first we only looked at married women, since we are interested in kidnapping, and second, there is no evidence of kidnapping in Tajikistan.

We also find that the extensive margin of labour supply is positive, although in our case the relationship is not statistically significant. Hence, lowering income tax, which currently stands at 10%, would not encourage greater participation by Kyrgyz women. The effect of bride kidnapping on female labour supply is strongly negative. Moreover, the participation decision of a woman is also influenced by the nature of her mother's marriage. Therefore, we conclude that forced marriage is a major obstacle to enhancing women's access to the labour market. In our view, this practice represents the very traditional attitudes in Kyrgyzstan, which tend to constrain female work outside the family environment. More than 80% of the participation gap between non-kidnapped and kidnapped married women based on the unmatched sample remains unexplained.

The unexplained part is still present even after we restrict the decomposition to the matched sample of kidnapped and non-kidnapped married women. In other words, our estimates show that there is still a significant unexplained component of the participation decision. This implies that other factors not included in this participation equation are likely to be determining this behaviour. We propose that traditional views might be one of the important factors explaining this outcome. Marriage customs as well as marital status, it appears, all play an important role in determining women's participation in the labour market. We suggest that these results have to be considered, if possible, when it comes to setting government's economic policies and, more broadly, distribution of public resources.

References

Abdulloev, Ilhom, Gang, Ira and Myeong-Su Yun. "Migration, Education and the Gender Gap in Labour Force Participation". *European Journal of Development Research*, vol. 26, 2014, pp. 509-526. https://doi.org/10.1057/ejdr.2014.27.

Barrientos, Armando, and Alma Kudebayeva. "Social Transfers and Women's Labour Supply in Kyrgyzstan". Brooks World Poverty Institute Working Paper No. 215, 2015. http://dx.doi.org/10.2139/ssrn.2704450

Bargain, Olivier, and Andreas Peichl. "Own-Wage Labor Supply Elasticities: Variation Across Time and Estimation Methods". *IZA Journal Of Labor Economics*, vol 5, no. 1, 2016. doi:10.1186/s40172-016-0050-z.

Becker, Charles M., Mirkasimov, Bakhrom, and Susan Steiner. "Forced Marriage and Birth Outcomes". *Demography*, vol 54, no. 4, 2017, pp. 1401–1423. doi:10.1007/s13524-017-0591-1.

Benczur, Peter, Katay, Gabor, Kiss, Aron, and Oliver M. Racz. "Income Taxation, Transfers and Labour Supply at the Extensive Margin". Banque de France Working Paper No. 487, 2014. http://dx.doi.org/10.2139/ssrn.2451016

Bicakova, Alena, Slacalek, Jiri, Michal Slavik. "Labor Supply after Transition: Evidence from the Czech Republic". ECB Working Paper No. 887, 2008. https://ssrn.com/abstract=1105388

Blundell, R., Bozio, A., and G. Laroque. "Labor Supply and The Extensive Margin". *American Economic Review*, vol 101, no. 3, 2011, pp. 482–486. *American Economic Association*, doi:10.1257/aer.101.3.482.

EBRD. "Legal Barriers to Women's Participation in the Economy in the Kyrgyz Republic". October 2015. https://www.ebrd.com/documents/admin/legal-barriers-gender.pdf

Fortin N, Lemieux T, and Firpo S. "Decomposition Methods in Economics". NBER Working Paper No. 16045, 2010. http://www.nber.org/papers/w16045

Handrahan, Lori. "Hunting For Women". *International Feminist Journal Of Politics*, vol 6, no. 2, 2004, pp. 207–233. doi:10.1080/1461674042000211308.

Heckman, James J. "Sample Selection Bias as a Specification Error". *Econometrica*, vol 47, no. 1, 1979, p. 153–161. doi:10.2307/1912352.

Kimmel, Jean, and Thomas J. Kniesner. "New Evidence On Labor Supply". *Journal Of Monetary Economics*, vol 42, no. 2, 1998, pp. 289–301. doi:10.1016/s0304-3932(98)00023-3.

Karymshakov, Kamalbek, and Burulcha Sulaimanova. "Migration Impact on Left-Behind Women's Labour Participation and Time-Use". WIDER WP 2017/119, 2017.

Kleinbach, Russ. "Frequency of non-consensual bride kidnapping in the Kyrgyz Republic". *International Journal of Central Asian Studies*, Vol 8, no. 1, 2003, pp. 108–128.

Kleinbach, Russ, and Lilly Salimjanova. "Kyz Ala Kachuu and Adat: Non-Consensual Bride Kidnapping and Tradition In Kyrgyzstan". *Central Asian Survey*, vol 26, no. 2, 2007, pp. 217–233. doi:10.1080/02634930701517466.

Klepikova, Ekaterina. "Labor Supply Elasticity in Russia". *Voprosy Ekonomiki*, no. 9, 2016, pp. 111-128. doi:10.32609/0042-8736-2016-9-111-128.

Landmann, Andreas, Helke Seitz, and Susan Steiner. "Patrilocal Residence and Female Labor Supply: Evidence From Kyrgyzstan". *Demography*, vol 55, no. 6, 2018, pp. 2181–2203. doi:10.1007/s13524-018-0724-1.

Muldoon, Ryan Patrick, and Ursula Casabonne. 2017. Gender norms in flux: bride kidnapping and women's civic participation in the Kyrgyz Republic (English). Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/609321512627138423/Gender-norms-in-flux-bride-kidnapping-and-women-s-civic-participation-in-the-Kyrgyz-Republic.

Nedoluzhko, Lesia, and Victor Agadjanian. "Between Tradition and Modernity: Marriage Dynamics in Kyrgyzstan". *Demography,* vol 52, pp. 861–882. https://doi.org/10.1007/s13524-015-0393-2

Nopo, Hugo. "Matching as a Tool to Decompose Wage Gaps". IZA Discussion Paper No. 981, 2004.

Pastore, Francesco, and Alina Verashchagina. "The Determinants of Female Labour Supply in Belarus". IZA Discussion Paper No. 3457, 2008.

Paul, Saumik. "The Effect of Emigration on Household Labor Supply: Evidence from Central Asia and South Caucasus". ADBI Working Paper 822, Asian Development Bank Institute, 2018.

Powers, Daniel A., Yoshioka H, and MS Yun. "Mvdcmp: Multivariate Decomposition for Nonlinear Response Models". *The Stata Journal: Promoting Communications On Statistics And Stata*, vol 11, no. 4, 2011, pp. 556–576. doi:10.1177/1536867x1201100404.

Siebertova, Zuzana, Matus Senaj, Norbert Svarda, and Jana Valachyova. "To Work or Not to Work? Updated Estimates of Labour Supply Elasticities". CELSI Discussion Paper 32, Central European Labour Studies Institute, Bratislava, 2015.

Siegelbaum, Lewis H. "On the Side: Car Culture in the USSR, 1960s-1980s." *Technology and Culture*, vol. 50, no. 1, 2009, pp. 1–23.

United Nations Population Fund in Kyrgyz Republic (UNFPA). Gender in Society Perception Study: National Survey Results. Bishkek, Kyrgyzstan: National Statistical Committee of the Kyrgyz Republic, 2016.

Werner, Cynthia. "Bride Abduction in Post-Soviet Central Asia: Marking a Shift Towards Patriarchy through Local Discourses of Shame and Tradition." *The Journal of the Royal Anthropological Institute*, vol. 15, no. 2, 2009, pp. 314–331. www.jstor.org/stable/20527710.

World Bank. Kyrgyzstan Country Profile. World Bank, Washington, D.C., 2019. https://data.worldbank.org/country/kyrgyz-republic

Yun, Myeong-Su. "Identification Problem And Detailed Oaxaca Decomposition: A General Solution And Inference". *Journal of Economic And Social Measurement*, vol 33, no. 1, 2008, pp. 27–38. doi:10.3233/jem-2008-0296.

Table 1. Summary statistics

	Participating		Non-participating	
	Mean	*Std. Dev.*	*Mean*	*Std. Dev.*
Age	38.152	0.356	32.36	0.378
Age^2	1574.02	27.19	1152.51	27.03
Jalal-Abad oblast (=1)	0.155	0.012	0.162	(0.014)
Naryn oblast (=1)	0.036	0.006	0.062	(0.009)
Batken oblast (=1)	0.100	0.010	0.061	(0.009)
Talas oblast (=1)	0.073	0.009	0.031	(0.006)
Chuy oblast (=1)	0.087	0.009	0.132	(0.012)
Osh oblast (=1)	0.284	0.015	0.243	(0.016)
Issyk-Kul (omitted)	0.075	0.009	0.115	(0.012)
Large town (=1)	0.149	0.012	0.134	(0.013)
Small town (=1)	0.006	0.003	0.004	(0.002)
Village (=1)	0.810	0.013	0.807	(0.015)
Urban-type village (omitted)	0.034	0.006	0.055	(0.008)
Primary tech (=1)	0.035	0.006	0.055	0.008
Secondary tech (=1)	0.143	0.011	0.107	0.011
University (=1)	0.215	0.013	0.138	0.013
Secondary or less (omitted)	0.607	0.016	0.700	0.017
Married (=1)	0.747	0.014	0.807	0.015
Widowed (=1)	0.058	0.008	0.024	0.006
Single (=1)	0.116	0.010	0.126	0.012
Divorced (omitted)	0.079	0.009	0.043	0.007
Migrant (=1)	0.166	0.012	0.141	0.013
Kidnapped (=1)	0.166	0.012	0.228	0.015
Mother kidnapped (=1)	0.180	0.013	0.205	0.015
Log of hourly earnings	3.442	0.021	3.330	0.010
N	933		740	

Source: Authors' estimations based on 2011 LIK data.

Notes: (i) We use SOATE (State Classification of Administrative and Territorial Units) codes to create dummy variables for urban settlements. (ii) Oblasts exclude towns and urban-type villages. 'Large town' consists of oblast-level towns and city of Osh. Rayon-level towns form our 'Small town' dummy variable. Urban-type villages (*poselki gorodskogo tipa*) form our reference category.

Table 2. Heckman two-step estimates of selection and earnings equations

	First stage		Second stage	
Age	0.0296**	(0.011)	0.0490*	(0.026)
Age^2	-0.0001	(0.0001)	-0.0007**	(0.0003)
Jalal-Abad oblast	0.104	(0.067)	0.259*	(0.152)
Naryn oblast	0.206**	(0.082)	0.304	(0.189)
Batken oblast	0.154*	(0.082)	0.197	(0.180)
Talas oblast	0.372***	(0.087)	0.312	(0.193)
Chuy oblast	0.126*	(0.070)	0.241	(0.156)
Osh oblast	0.150**	(0.064)	0.167	(0.146)
Large town	0.134*	(0.073)	0.0425	(0.150)
Small town	0.231	(0.193)	0.223	(0.332)
Village	-0.0934	(0.085)	-0.0707	(0.184)
Primary Tech	-0.0101	(0.071)	0.274*	(0.157)
Secondary Tech	0.172***	(0.043)	0.259**	(0.095)
University	0.302***	(0.038)	0.641***	(0.108)
Married	-0.292***	(0.060)	-0.0551	(0.116)
Widowed	-0.0889	(0.093)	-0.135	(0.149)
Single	-0.0986	(0.073)	-0.127	(0.135)
Migrant	0.0118	(0.042)	-0.0505	(0.080)
Kidnapped	-0.100**	(0.039)		
Mother kidnapped	-0.0862**	(0.041)		
λ			-0.0086	(0.186)
Constant			2.383***	(0.629)
N		1364		

Source: Authors' estimations based on 2011 LIK data.
Notes: (i) For the first-stage participation equation, we report marginal effects at the means. (ii) The non-kidnapped group is the sum of love and arranged marriage. We have formed this (reference) group based on the result of the likelihood-ratio Chow test which tests whether it is statistically legitimate to separate these two groups against whether we should combine them for the model. We use the 'lrtest' command in Stata to obtain the p-value (0.319) for this test. The result indicates that the two groups should be combined. We have also applied the same test to confirm that the generating function is different between kidnapped married women and the rest of married women (the p-value obtained was 0.016). These estimates are available from the authors upon request. (iii) Standard errors are in parentheses. *** $p<0.01$; ** $p<0.05$; * $p<0.1$.

Table 3. Probit estimates of women's LFP

Age	0.0205**	(0.010)
Age^2	-0.00009	(0.0001)
Jalal-Abad oblast	0.122**	(0.054)
Naryn oblast	0.0234	(0.072)
Batken oblast	0.251***	(0.063)
Talas oblast	0.332***	(0.073)
Chuy oblast	0.0028	(0.057)
Osh oblast	0.175***	(0.049)
Large town	0.146**	(0.070)
Small town	0.233	(0.189)
Village	0.0481	(0.074)
Primary Tech	-0.0738	(0.063)
Secondary Tech	0.0827**	(0.041)
University	0.169***	(0.040)
Married	-0.175**	(0.054)
Widowed	-0.0718	(0.087)
Single	-0.0241	(0.066)
Migrant	-0.0208	(0.037)
Log of earnings	0.0028	(0.029)
N	1673	

Notes: We report marginal effects at the means. Standard errors are in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.

Table 4. Decomposition of participation differences (unmatched sample)

	Coefficients	Standard errors	Share
Endowments	0.0226**	(0.010)	17%
Coefficients	0.1095**	(0.034)	83%
Overall	0.1321***	(0.032)	100%
Endowments:			
Age	-0.027***	(0.008)	
Age^2	0.013**	(0.006)	
Jalal-Abad oblast	-0.004**	(0.002)	
Naryn oblast	-0.005	(0.006)	
Batken oblast	0.011***	(0.003)	
Talas oblast	-0.005**	(0.001)	
Chuy oblast	-0.001	(0.002)	
Osh oblast	0.019***	(0.005)	
Large town	0.002	(0.005)	
Small town	0.003	(0.002)	
Village	-0.002	(0.005)	
Primary tech	0.007**	(0.003)	
Secondary tech	0.001	(0.002)	
University	0.011**	(0.005)	
Migrant	0.00045	(0.0002)	
Log of hourly earnings	0.0002	(0.002)	
N		1307	

Source: Authors' estimations based on 2011 LIK data.
Notes: (i) Married women only. We compute decomposition estimates using the 'mvdcmp' command in Stata (see Powers et al., 2011). (ii) *** p<0.01; ** p<0.05; * p<0.1.

Table 5. Decomposition of participation differences (matched sample)

	Coefficients	Standard errors	Share
Endowments	0.0136	(0.0111)	10%
Coefficients	0.1278***	(0.0366)	90%
Overall	0.1415***	(0.0347)	100%
N		942	

Source: Authors' estimations based on 2011 LIK data.

Notes: (i) Married women only. Matching (with replacement) is based on age, education and rural location. We use the 'nopomatch' command in Stata to obtain the matched sample. The non-kidnapped married women form the control (untreated) group. The same woman in the non-kidnapped group was used more than once to form the control group. (ii) *** $p<0.01$; ** $p<0.05$; * $p<0.1$.