

Evaluating the Impact of Ethiopia's Revised Family Code on Child Marriage and Women's Educational Attainment: Evidence from Generalized Difference-in-Differences and Instrumental Variable Estimation

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Abstract: Child marriage remains one of the most persistent barriers to women's educational attainment and socioeconomic empowerment in developing countries. To address this challenge, Ethiopia revised its Family Code in 2000, increasing the legal minimum age of marriage from 15 to 18 years. This study evaluates the causal impact of the Revised Family Code (RFC) on child marriage, age at first marriage, and women's educational attainment, and further examines the effect of child marriage on educational attainment. The analysis employs pooled data from the Ethiopian Demographic and Health Surveys (2000, 2005, 2011, and 2016), comprising approximately 171,000 observations. Exploiting the staggered implementation of the RFC across Ethiopia's regional states, the study applies a generalized Difference-in-Differences (DID) model with multiple groups and time periods to estimate the policy effect. To address the endogeneity between child marriage and educational attainment, Two-Stage Least Squares (2SLS) estimation is employed using the policy treatment indicator as an instrumental variable. The findings show that implementation of the Revised Family Code significantly reduced the probability of child marriage, increased the average age at first marriage, and improved women's educational attainment. The instrumental variable estimates further reveal that delaying marriage substantially increases years of completed education, whereas child marriage significantly reduces educational attainment. Robustness checks using restricted samples, falsification tests, and policy endogeneity assessments confirm the validity and consistency of the results. The findings demonstrate that legal reform can generate meaningful improvements in women's educational outcomes when effectively implemented. The study contributes to the literature by providing one of the first causal evaluations of Ethiopia's Revised Family Code using generalized DID and instrumental variable approaches, offering important policy evidence for countries seeking to eliminate child marriage and advance gender equality under the Sustainable Development Goals.

Keywords: Child marriage; Revised Family Code; Educational attainment; Generalized Difference-in-Differences; Instrumental variables; Two-Stage Least Squares; Legal reform; Ethiopia.

1. Introduction

1.1. Background of the study

International organizations recognize child marriage as a violation of children's rights and a major barrier to gender equality and sustainable development. The United Nations has consistently called for the elimination of child, early, and forced marriage through international commitments, including the Beijing Platform for Action and Sustainable Development Goal (SDG) Target 5.3. Despite these efforts, child marriage remains widespread, with an estimated 15 million girls marrying before the age of 18 each year. Without effective interventions, nearly 1.2 billion girls are projected to marry before reaching adulthood by 2050 (Tong & White, 2017).

Child marriage remains particularly prevalent in Sub-Saharan Africa. DHS data from 34 countries show that 54% of women

aged 20–24 were married before the age of 18, although substantial variation exists across countries, ranging from 16.5% in Rwanda to 81.7% in Niger (Yaya et al., 2019). Although several African countries have experienced gradual declines, progress has been uneven, with some countries recording stalled or even increasing rates of child marriage (Koski et al., 2017). UNICEF (2015; 2018a) further notes that population growth continues to increase the absolute number of child marriages despite declining prevalence rates. In Ethiopia, significant progress has been achieved, with child marriage declining from approximately 60% in 2005 to 40% in 2015. Nevertheless, four out of every ten women aged 20–24 still marry before the legal age of 18, indicating that child marriage remains a major social challenge (UNICEF, 2018; Mekonnen et al., 2018).

Child marriage has profound consequences for girls' education, health, and socioeconomic wellbeing. It violates fundamental human rights, limits educational attainment, increases school dropout, reduces employment opportunities, and perpetuates intergenerational poverty (Parsons et al., 2015; Jensen & Thornton, 2003; Malhotra, 2013). Child brides are more likely to experience early pregnancy, maternal health complications, social isolation, gender-based violence, and limited decision-making power within their households (Nour, 2009; Le Strat et al., 2011; Vogelstein, 2013; UNICEF, 2014). Empirical studies consistently demonstrate that delaying marriage significantly improves educational attainment, while early marriage substantially reduces girls' opportunities to complete schooling (Field & Ambrus, 2008; Lloyd & Mensch, 2008; Nguyen & Wodon, 2012).

In Ethiopia, the average age at first marriage remains below the legal minimum, at approximately 16.5 years, indicating that child marriage continues to affect a large proportion of girls (Ethiopian DHS, 2016). Existing studies largely attribute child marriage to religious beliefs, poverty, and entrenched social norms (UNICEF, 2016). To address this problem, the Ethiopian government enacted the Revised Family Code (RFC) in 2000, increasing the minimum legal age of marriage from 15 to 18 years. However, limited evidence exists on the causal impact of this legal reform on child marriage and women's educational attainment. Using the staggered implementation of the Revised Family Code as an exogenous policy intervention, this study evaluates its impact on child marriage, age at first marriage, and women's educational attainment, while also examining the causal effect of child marriage on educational attainment in Ethiopia.

1.2. Research questions of the study

This study is aimed to answer the following three research questions.

1. What is the impact of adopting the RFC on the age at marriage in Ethiopia?
2. What is the impact of adopting the RFC on women's educational attainment in Ethiopia?
3. What is the impact of the age at marriage on women's educational attainment in Ethiopia?

1.4. Hypotheses of the study

1. Adoption of the RFC significantly increases the age at marriage in Ethiopia.
2. Adoption of the RFC significantly increases the maximum years of completed education in Ethiopia.

3. Age at marriage significantly increases Ethiopian women's maximum years of completed education.

2. Methods and Strategies of Research

3.1. Data sources and types

The main source of data for the study is the Ethiopian DHS. So far, Ethiopia has conducted DHS four times (2000, 2005, 2011, and 2016). Thus, this study used all existing results of the DHS data. Authors create pooled cross-sectional across time using all available Ethiopia's DHS data.

3.2. Identification strategy

In 2000, the Ethiopian government revised the 1960 Family Code. In 1960's Family Code, the minimum legal age for marriage was 15 years. However, the RFC increased the legal age for marriage to 18 years. The RFC has been implemented since 2000. This Family Code touches on different issues related to family-building, from marriage to divorce, including the legal age for marriage. This study focuses on the minimum age at marriage, which is declared by Article 7 sub-article one: "neither a man nor a woman who has not attained the full age of eighteen years shall conclude a marriage". To address identified research gaps, the Authors used this exogenous policy intervention.

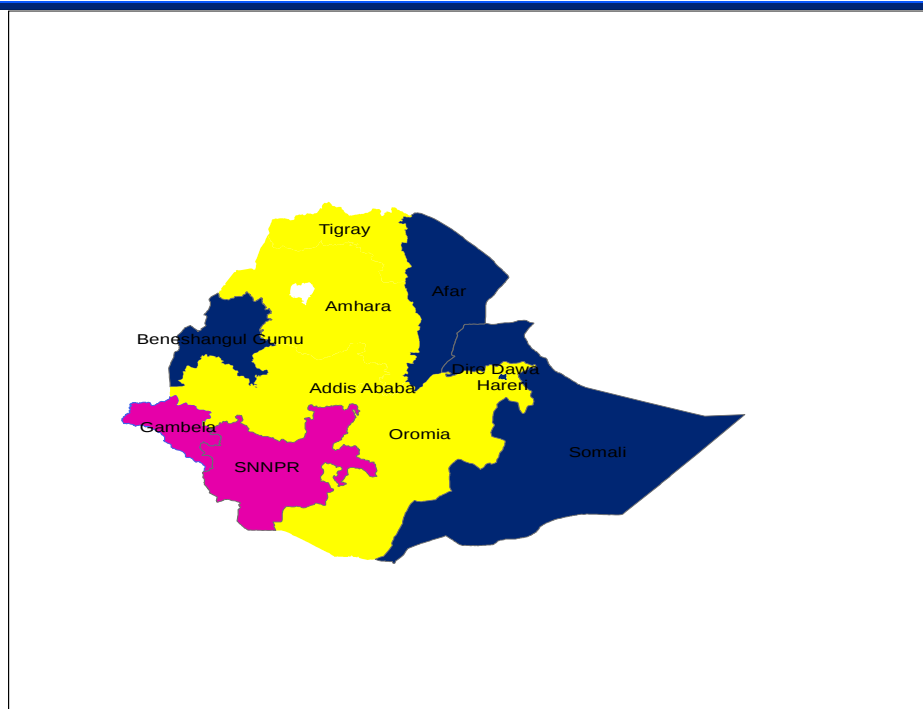
3.3. Econometric model

3.3.1. Generalized DID with multiple groups and time periods

Ethiopia is a federal country that has ten regions: Tigray, Amhara, Afar, Oromia, Somali, SNNP of Ethiopia, Gambela, Benishangul-Gumuz, Sidama, and Harari and Addis Ababa and Dire Dawa city administrations. Sidama regional state was established in 2019. Before 2019, Sidama regional state was part of the SNNP of Ethiopia. Thus, in this study, the authors consider the Sidama regional state as part of the SNNP of Ethiopia.

Once the federal government approved the RFC in 2000, there were geographic and time variations among the regional governments in the adoption of the program. These variations create multiple groups and time periods on the adoption of the program. It was immediately adopted by Tigray, Amhara, and Oromia and Addis Ababa and Dire Dawa City Administrations (Gajigo and Hallward, 2005). These immediate adopters of the policy are categorized under Group One. The other six regions delayed the adoption of the RFC. After 2005 two more regional states adopted the RFC (Gambela and SNNP of Ethiopia) and the remaining four regions (Benishangul-Gumuz, Afar, Somali, and Harari) were implementing the 1960 family code (Hombrados, 2017). These two regional states are categorized under Group Two. Lastly, after 2011, the outstanding four regional states adopted the program. The late adopters of the policy are categorized under Group Three.

Figure 1: Description of geographic variation on adoption of the RFC



Source: drawn by authors

For this study, all regions that adopted the RFC in the first phase (Tigray, Amhara, Oromia, Addis Ababa, and Dire Dawa) are categorized under Group One and marked in yellow color as shown above. The regions with Rose color (SNNPR of Ethiopia and Gambela) are categorized under Group Two. The other regions with Blue color (Benishangul-Gumuz, Somali, Afar, and Harari) are categorized under Group Three to run our generalized DID with multiple groups and time estimation techniques.

Depending on year of the marriage of our respondents, the authors identifies four time periods: pre-2000, 2001-2005, 2006-2011, and 2012-2016. The existence of time and geographic variations on the adoption of the RFC led to the adoption of a Generalized DID with multiple groups and time periods research design.

To estimate the immediate impact of adopting RFC, the authors run the following Generalized DID with multiple groups and time period regression. The immediate impact of the RFC adoption is measured by rate of the prevalence of the RFC, age at marriage and women's educational attainments.

$$\begin{aligned}
 (\text{immediateimpactofadoptingRFC})_{igt} &= \beta_0 + \delta_1(\text{treatmentdummy})_{igt} \\
 &+ \beta_1(\text{wealthindexdummy})_{igt} \\
 &+ \beta_2(\text{urbanresidencydummy})_{igt} \\
 &+ \beta_3(\text{dummyforxposuretomedial})_{igt} \\
 &+ \beta_4(\text{setofreligiondummy})_{igt} \\
 &+ \beta_5(\text{workstatusdummy})_{igt} \\
 &+ \beta_6(\text{familysize})_{igt} \\
 &+ \beta_7(\text{femaleheadedhh})_{igt} \\
 &+ \beta_8(\text{partnerseducationinyears})_{igt} \\
 &+ \lambda_t + \alpha_g + \psi_g t + \varepsilon_{igt} - - - - - \\
 &- - - - (1)
 \end{aligned}$$

In equation one, $(\text{immediateimpactofadoptingRFC})_{igt}$ represent the immediate goal of adopting the RFC which includes its effect on prevalence of child marriage, age at marriage and maximum years of women's education attainments; $(\text{treatmentdummy})_{igt}$ is a dummy variable that represent whether RFC was active for woman 'i' in the group 'g' at time 't' when she got married; $(\text{wealthindexdummy})_{igt}$ represent wealth index of the individual; $(\text{urbandummy})_{igt}$ represent a dummy variable for an urban resident; $(\text{workstatusdummy})_{igt}$ represent a dummy for work status; $(\text{dummyforexposuretomedial})_{igt}$ dummy for the frequency of exposure to mass media per-week; $(\text{familysize})_{igt}$ shows number of family members and $(\text{orderofbirth})_{igt}$ shows the order of birth in the family; $(\text{partnerseducationinyears})_{igt}$ partners maximum years of completed education; λ_t time periods dummies; α_g groups dummies and $\psi_g t$ group specific linear time trends and ε_{igt} is an error term for woman "i" group 'g' at time 't'. δ is the parameter of interest, which

indicates the impact of the implementation of the RFC on outcome variables in Ethiopia.

One of the basic assumptions we need to test under generalized DID with multiple groups and time periods estimation techniques is whether the parallel trend assumption holds or not. To generate the pseudo treatment value, the authors create four pseudo time periods depending on the year of marriage of respondents: Pre-1985; 1985-1990; 1991-1995; 1996-1999. The authors also assume that group 1 adopted the policy in the time period 1985-1990, group two adopted the policy in the time period 1991-1995, and group three adopted the policy in the time period 1996-1999. Thus, the authors identify the pseudo treatment dummy value that represents whether RFC was active for individual 'i' from group 'g' at time 't' when she got married. Thus, we conducted the placebo test to know whether our outcome variable had the same trend before the adoption of the Revised Family Code in Ethiopia or not. The result is presented in the next chapter.

3.3.2. Test of policy endogeneity problem

To address potential policy endogeneity, the authors test whether RFC adoption was influenced by pre-existing trends in child marriage prevalence, age at marriage, and women's educational attainment. Since region fixed effects alone may

not eliminate this concern, they regress the post-adoption indicator on one- and two-year lags of these variables (Besley & Case, 2000; Hahn & Yang, 2016).

$$\begin{aligned}(post)_{gt} = & \beta_0 + \beta_1(lagoneearlymarriage)_{igt} \\ & + \beta_2(lagtwoearlymarriage)_{igt} \\ & + \beta_3(lagoneageatmarriage)_{igt} \\ & + \beta_4(lagtwoageatmarriage)_{igt} \\ & + \beta_5(lagoneyeducationinyears)_{igt} \\ & + \beta_6(lagtwoeducationinyears)_{igt} \\ & + \varepsilon_{igt} \text{-----}(2)\end{aligned}$$

Where, $(Post)_{gt}$ represent for whether group 'g' at time period 't' adopted the RFC or not; $(lagoneearlymarriage)_{igt}$ represent for lag one year of dummy for the prevalence of child marriage; $(lagtwoearlymarriage)_{igt}$ represent for lag two years of dummy for the prevalence of child marriage; $(lagoneageatmarriage)_{igt}$ represent for lag one year of age at marriage; $(lagtwoageatmarriage)_{igt}$ lag two year of age at marriage; $(lagoneyeducationinyears)_{igt}$ represent for lag one year of women maximum years of education attainment; $(lagtwoeducationinyears)_{igt}$ represent for lag two years of women maximum years of education attainment.

Table 1: Test of policy endogeneity problem

Variables	Post _{gt}	Post _{gt}	Post _{gt}	Post _{gt}
First lag of prevalence of child marriage	.001 (.003)			-.002 (.0003)
Second lag of prevalence of child marriage	.0002 (.0005)			.0002 (.0003)
First lag of age at marriage		-.001 (.0003)		-.001 (.0003)
Second lag of age at marriage		.0004 (.0001)		.0005 (.0001)
First lag of years of completed education			.0008 (.0006)	.001 (.0002)
Second lag of years of completed education			-.0003 (.0002)	-.0005 (.0001)
Observation	170,986	169,990	170,985	169,990
R-square	0.93	0.94	0.93	0.94
Source: Authors' estimation				
*, ** and *** represent for 10%, 5% and 1% significance level, respectively				

Table 1 presents a test for policy endogeneity problem on adoption of the RFC across the regional government of Ethiopia. All the coefficients are close to zero and statistically insignificant. We find no significant impact of previous prevalence of child marriage, age at marriage and education gender disparity on the timing of adoption of the RFC across the regional government of Ethiopia. This result implies that policy endogeneity is not a huge concern in this study.

3.3.3. Two-Stage Least-Squares (2SLS) estimation methods

■ Issues and requirements

Women's educational attainment and child marriage are jointly determined, creating endogeneity through reverse causality, omitted variable bias, and measurement error. Consequently, OLS estimates are likely to be biased and inconsistent (Heanue & O'Donoghue, 2014). To address this, the study employs an instrumental variable (IV) approach. A

valid IV must be correlated with the endogenous explanatory variable (relevance) but uncorrelated with the outcome and error term (exogeneity/exclusion restriction), thereby producing consistent estimates (Card, 1999; Cawley & Meyerhoefer, 2012; Murray, 2006).

■ Functional form of the model

The authors created the exogenous IV 'the treatment dummy' that shows whether the RFC was active for individual 'i', from group 'g' at time 't' when she got married. As explained in the analysis and discussion part, this instrumental variable fulfills exogeneity and exclusion restriction requirements (Wooldridge, 2013).

First-stage regression equation:

$$\begin{aligned} (\widehat{earlymarriage})_{igt} &= \delta_0 + \delta_1(treatmentdummy)_{igt} \\ &+ \beta_1(wealthindex)_{igt} + \beta_2(urban)_{igt} \\ &+ \beta_3(mediaexposure)_{igt} \\ &+ \beta_4(religion)_{igt} + \beta_5(workstatus)_{igt} \\ &+ \beta_6(familysize)_{igt} \\ &+ \beta_7(femaleheadedhh)_{igt} \\ &+ \beta_8(partnerseducationinyears)_{igt} \\ &+ \beta_9(birthorder)_{igt} + \lambda_t + \alpha_g + \psi_g t \\ &+ \varepsilon_{igt} - - - - - \\ &- (3) \end{aligned}$$

Second-stage regression equation:

$$\begin{aligned} (educatt)_{igt} &= \alpha_0 + \delta_1(\widehat{earlymarriage})_{igt} \\ &+ \delta_2(wealthindex)_{igt} + \delta_3(urban)_{igt} \\ &+ \delta_4(religion)_{igt} + \delta_5(workstat)_{igt} \\ &+ \delta_6(partnerseducationinyears)_{igt} \\ &+ \delta_7(mediaexp)_{igt} + \delta_8(famsize)_{igt} \\ &+ \delta_9(birthorder)_{igt} \\ &+ \delta_{10}(femaleheadedhh)_{igt} + \lambda_t + \alpha_g \\ &+ \psi_g t + \varepsilon - - - - - (4) \end{aligned}$$

$(treatmentdummy)_{igt}$ represent treatment dummy whether the RFC was active for individual 'i' from group 'g' at time 't' when she got married; $(Eduatt)_{igt}$ is women's maximum years of completed education; $(earlymarriage)_{igt}$ is the dummy variable for early marriage; $(wealthindex)_{igt}$ is the dummy for wealth index of the individual; $(urban)_{igt}$ is the dummy variable for an urban resident; $(workstat)_{igt}$ is the partner's work status; $(parteduc)_{igt}$ is the partner's education in years; $(media)_{igt}$ denotes the frequency of exposure to mass media; $(famsize)_{igt}$ shows the number of family members and $(birthorder)_{igt}$ shows the order of birth in the family.

■ Specification tests

For the validity of the constructed instrumental variable, it should fulfill exogeneity and exclusion restriction requirements. For the validity of the exclusion restriction requirement, Wald 'F' statistics must exceed 10 to ensure that the instrument is not weak (Wooldridge, 2013). The exclusion restriction condition will be checked through the theoretical justification of the absence of any relationship between IV and variables in the error terms.

4. Results and Discussion

The study evaluates the impact of adopting the RFC on early marriage, age at marriage, and women educational attainment and to analyze the impact of early marriage on women educational attainment in Ethiopia. To answer these objectives, the authors designed mainly two estimation techniques: Generalized DID with multiple groups and time periods and 2SLS.

4.1. Summary statistics

This study uses pooled cross-sectional data from all four waves of the Ethiopian Demographic and Health Survey (DHS), comprising approximately 170,000 observations, to examine the impact of the Revised Family Code (RFC) on early marriage and women's educational attainment. The main outcome variables are age at marriage, early marriage (dummy), and years of completed education, while the analysis controls for household, demographic, and socioeconomic characteristics.

Table 2: Summary statistics

Variables	Summary for Major data file			Summary for treated observations		Summary for untreated observations	
	Observations	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Place of residence (1 if urban)	170,987	.178	.382	.234	.424	.171	.377
Religion dummy							
Orthodox	65,958	.386	.487	.381	.485	.381	.486
Catholic	1,518	.009	.094	.006	.079	.010	.099
Muslim	71,396	.418	.493	.426	.494	.414	.492
Protestant	27,933	.163	.370	.009	.093	.010	.099
Traditional	2,890	.017	.129	.016	.124	.020	.138

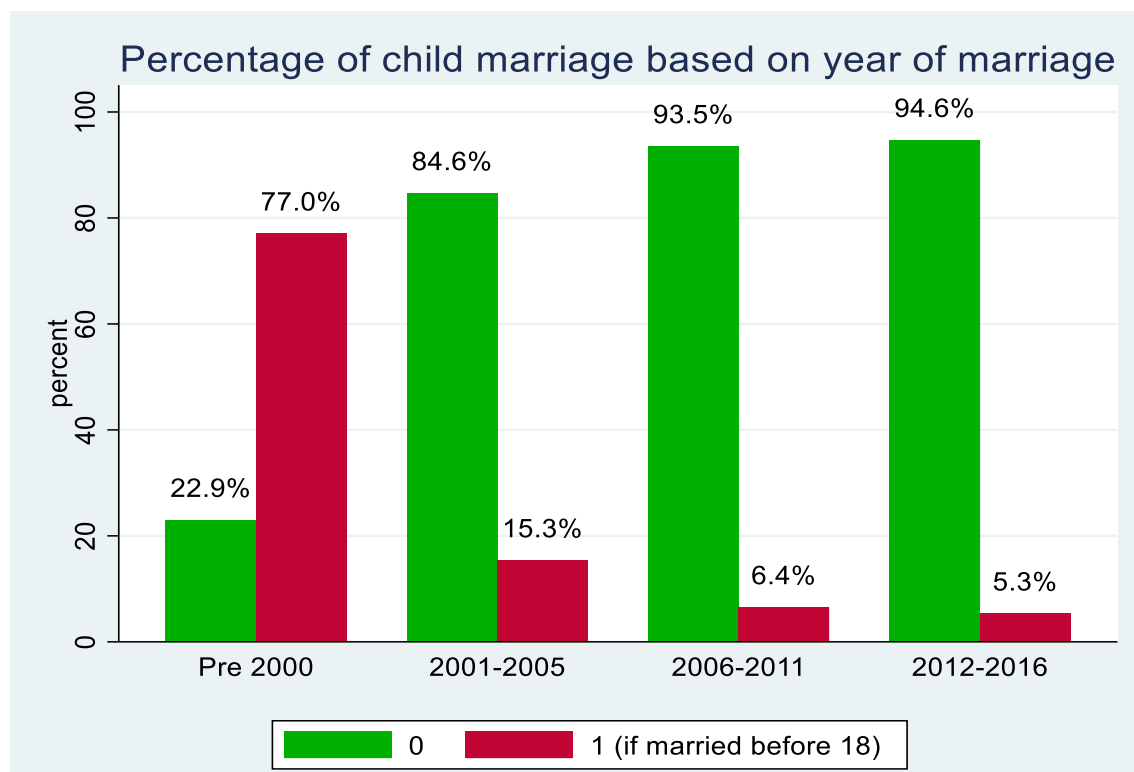
Other	461	.003	.052	.005	.067	.002	.045
Wealth index	126,813	.528	.499	.571	.495	.521	.500
Employment status	170,891	.387	.487	.453	.498	.362	.480
Female headed household	170,987	.219	.413	.218	.413	.220	.414
Age at marriage (Years)	170,401	15.96	3.484	18.108	4.262	15.708	3.288
Number of family members	170,987	6.398	2.354	5.410	2.174	6.515	2.346
Education (in Years)	170,987	1.161	2.863	2.688	4.104	.981	2.621
Early marriage (1/0)	170,987	.726	.446	.524	.499	.750	.432
Media exposure (1/0)	170,778	.164	.370	.261	.439	.153	.359
Group one dummy	170,987	.506	.500	.279	.448	.721	.448
Group two dummy	170,987	.205	.404	.249	.432	.751	.432
Group three dummy	170,987	.269	.443	.265	.442	.734	.442
Partner's education (Years)	165,998	3.266	10.175	4.843	9.426	3.083	10.242
Modern contraceptive usage	170,987	.156	.363	.299	.457	.139	.346

Source: Authors' estimation

The descriptive statistics show that the average age at marriage is 15.96 years, below the legal minimum of 18 years. More than 72% of women married before age 18, and the average educational attainment is only 1.16 years. Compared with the control group, treated women marry later (18.11 vs. 15.71 years), are less likely to marry early (52.4% vs. 75.0%),

and attain more education (2.69 vs. 0.98 years). Treated households also exhibit relatively better socioeconomic characteristics, including higher wealth, employment, media exposure, partner's education, and land ownership, although most respondents in both groups are male-headed, rural households.

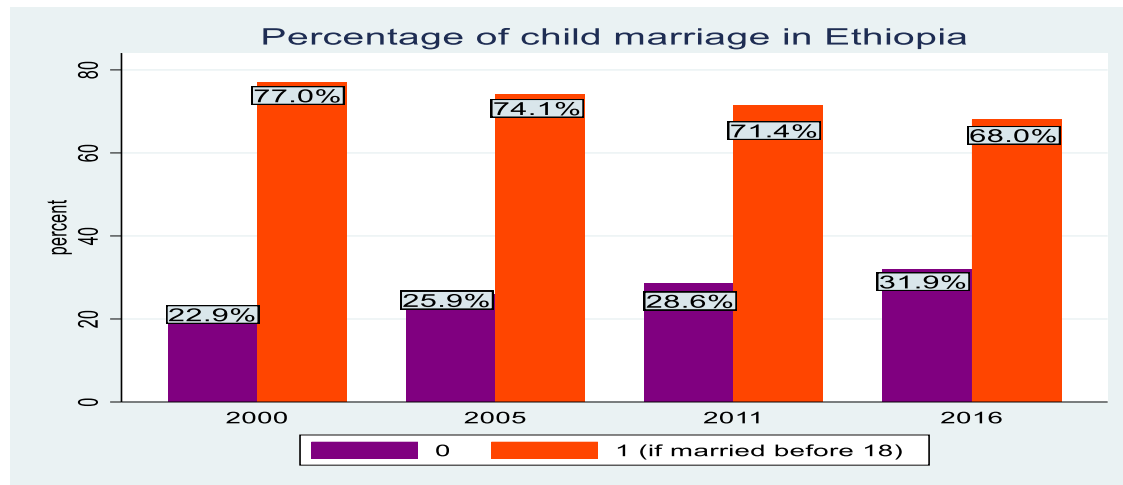
Figure 2: prevalence of child marriage based on year of marriage



Source: Drawn by authors

Figure 2 shows the prevalence of child marriage for individual 'i' from group 'g' at time 't' when she got treatment. Before the approval of the RFC, 77 percent of our respondents

married before the legal age of marriage. After adoption of the RFC the prevalence of child marriage continuously decline for observations that got treatment.

Figure 3: prevalence of child marriage in Ethiopia

Source: Drawn by authors

The above clustered bar chart shows the prevalence of early marriage across different time periods. In pre-2000, 77

percent of our observations married before the legal age of marriage. This value slightly declined to 68 percent in 2016.

4.2. Immediate impact of adopting the RFC

4.2.1. Impact of adopting the RFC using full sample

The Revised Family Code (RFC) raised the legal minimum age of marriage to 18 years and was adopted at different times across regions. Adoption occurred in three phases: Group 1 (2000–2005), Group 2 (2005–2011), and Group 3 (after 2011). This staggered implementation enables the use of a

generalized difference-in-differences (DID) design with multiple groups and time periods. The following table reports the immediate effects of RFC adoption on early marriage, age at marriage, and women's educational attainment using the full sample.

Table 3: Immediate impact of adopting the RFC using full sample

Variables	Child Marriage(1 if married before 18)		Age at marriage (Years)		Education Attainment (Years)	
	(1)	(2)	(3)	(4)	(5)	(6)
Group-time ATET (1/0)	-.074*** (.009)	-.074*** (.009)	.591*** (.069)	.165*** (.033)	.0181 (.030)	.124*** (.032)
Urban Residence (1/0)		-.024*** (.004)		.034** (.014)		1.988*** (.032)
Employment Status (1/0)		-.004* (.002)		.011 (.009)		.275*** (.014)
Media Exposure (1/0)		-.025*** (.003)		.050*** (.013)		1.452*** (.025)
Size of HH		.006*** (.0005)		-.006*** (.002)		-.089*** (.003)
Modern contraceptive (1/0)		-.0009 (.003)		.042*** (.011)		.568*** (.021)
Dummy for time period 2006-2011	.148*** (.014)	-.051*** (.005)	.267*** (.038)	.062*** (.018)	.052** (.023)	.062*** (.020)
Dummy for time period 2012-2016	.104*** (.011)	-.028*** (.004)	-.069*** (.029)	.165*** (.021)	.070** (.032)	.256*** (.029)
Dummy for second group	.148*** (.014)	.147*** (.014)	-1.331*** (.107)	-.346*** (.051)	-.072 (.047)	-.223*** (.062)
Dummy for third groups	.104*** (.011)	.104*** (.011)	-.836*** (.085)	-.167*** (.040)	-.069 (.061)	-.123*** (.044)

Constant	29.1*** (1.528)	28.7*** (1.533)	-208.1 *** (11.679)	-40.2*** (6.784)	-138.1*** (10.021)	-69.3*** (8.860)
Group specific- linear time trend	Yes	Yes	Yes	Yes	Yes	Yes
Individual and household variables	Yes	Yes	Yes	Yes	Yes	Yes
Observation	170,987	170,682	170,401	148,148	170,987	147,880
R-Square	0.07	0.07	0.11	0.82	0.20	0.41
Source: Authors' estimation ***, **, * one, five, and ten percent significance level, respectively						

Table 3 presents the impact of the Revised Family Code (RFC) on child marriage, age at first marriage, and women's educational attainment. The results indicate that adoption of the RFC significantly reduced the probability of child marriage by about 7 percentage points while increasing the age at first marriage and women's educational attainment. Urban residence, employment, and media exposure were also associated with lower child marriage and better educational outcomes.

These findings support human capital theory, which suggests that delaying marriage allows girls to invest more time in

education and accumulate skills that improve their future socioeconomic outcomes. The results also align with institutional theory, which argues that legal reforms can influence individual behavior by changing formal rules and social norms. The findings are consistent with previous studies showing that raising the legal age of marriage reduces child marriage and improves girls' educational attainment (Field & Ambrus, 2008; Lloyd & Mensch, 2008; Nguyen & Wodon, 2012; Parsons et al., 2015). Overall, the evidence suggests that the Revised Family Code has been an effective policy instrument for promoting girls' education while reducing child marriage in Ethiopia.

4.2.2. Impact of adopting the RFC using restricted sample

Treated observations are those for whom the RFC was in effect at the time of marriage. To test the robustness of the results, sensitivity analyses were conducted using women aged over 30 and those who had lived in their place of

residence for more than 20 years, addressing potential bias from age and migration. The following table presents the results for these restricted samples.

Table 4: Immediate impact of adopting the RFC using restricted sample

Variables	Child marriage dummy		Age at marriage (years)		Women educational attainment (years)	
	Sensitivity for marriage at later age	Sensitivity check for migration	Sensitivity for marriage at later age	Sensitivity check for migration	Sensitivity for marriage at later age	Sensitivity check for migration
	(1)	(2)	(3)	(4)	(5)	(6)
Group-time ATET (1/0)	-.087*** (.009)	-.072*** (.011)	.165** (.080)	.161*** (.046)	.127** (.056)	.132** (.055)
Urban Residence (1/0)	-.004 (.008)	-.152*** (.020)	.001 (.0008)	1.748*** (.165)	2.085*** (.065)	1.921*** (.045)
Dummy for time period 2006-2011	.260*** (.019)	-.093*** (.013)	1.324*** (.075)	.831*** (.110)	-.504*** (.127)	.047* (.028)
Dummy for time period 2012-2016	-.271*** (.012)	-.083*** (.014)	.862*** (.046)	.913*** (.082)	1.632*** (.107)	-96.558*** (33.504)
Dummy for group two	.075*** (.015)	-34.734*** (9.346)	-.383*** (.053)	-.742*** (.070)	.860*** (.213)	1.164*** (.085)
Dummy for group three	-.152*** (.014)	29.517*** (6.184)	.394*** (.048)	-198.134*** (41.304)	.795*** (.106)	.8002*** (.076)
Constant	2.195*** (.018)	10.117*** (1.171)	4.655*** (.091)	-71.004*** (10.074)	.764*** (.084)	-67.206*** (6.096)
Group specific linear time trend	Yes	Yes	Yes	Yes	Yes	Yes
Individual and household variables	Yes	Yes	Yes	Yes	Yes	Yes

Observation	27,524	92,438	27,524	92,440	31,418	90,904
R-Square	0.47	0.10	0.87	0.23	0.41	0.43
Source: authors' estimation ***, **, * one, five and ten percent significance level, respectively						

Table 4 presents robustness checks using restricted samples. The results remain consistent with those obtained from the full sample, indicating that the Revised Family Code (RFC) continued to reduce child marriage while increasing the age at first marriage and women's educational attainment. The

4.2.3. Falsification test

A key assumption of the generalized DID approach is the parallel trends assumption. To test this, the study conducts a placebo test using only pre-RFC data and pseudo treatment Table 5: Falsification test

consistency across different sample specifications confirms the robustness of the findings and supports the reliability of the estimated policy effects (Angrist & Pischke, 2009; Wooldridge, 2013).

periods and groups based on the actual adoption sequence. The resulting coefficients assess whether the outcome variables followed similar pre-adoption trends across groups.

Variables	Child marriage (1 if married before 18)		Age at first marriage (years)		Education Attainment in years	
	(1)	(2)	(3)	(4)	(5)	(6)
Pseudo Group-time ATET (1/0)	.665 (.459)	.004 (.006)	-.066 (.044)	-.024 (.043)	.155 (.276)	.039 (.261)
Urban Residence		-.037*** (.004)		.334*** (.035)		2.603*** (.311)
Media Exposure		-.009** (.004)		.161*** (.031)		1.670*** (.234)
Female headed household		-.026*** (.003)		.144*** (.025)		.076* (.039)
Constant	-52.898*** (6.816)	43.486*** (3.636)	14.460*** (.538)	14.394*** (.093)	-136.6*** (6.611)	-69.369*** (9.028)
Dummies for groups	Yes	Yes	Yes	Yes	Yes	Yes
Dummies for time periods	Yes	Yes	Yes	Yes	Yes	Yes
Group specific linear time trend	Yes	Yes	Yes	Yes	Yes	Yes
Individual and household variables	Yes	Yes	Yes	Yes	Yes	Yes
Observation	123,526	123,804	123,963	123,367	123,963	123,804
R-square	0.16	0.08	0.06	0.10	0.22	0.36
Source: authors' estimation ***, **, * one, five and ten percent significance level, respectively						

Table 5 shows the placebo test value of the impact of the Revised Family Code on different outcome variables before adoption of the Revised Family Code. Column 1 and 2 show the placebo impact of adopting the Revised Family Code on the probability of Child marriage. The coefficient on pseudo treatment shows the insignificant placebo test value of the impact of adopting the program on the probability of Child Marriage in Ethiopia. Column 3 and 4 show the placebo test value of impact of adopting the Revised Family Code on age at first marriage. The coefficient on pseudo treatment shows

a statistically insignificant placebo test value of the impact of adoption of the Revised Family Code on age at first marriage before the implementation of the program. The last two columns show the placebo impact of adopting the program on women's maximum years of completed education using the pseudo treatment value. The coefficient on pseudo treatment shows insignificant placebo test value of the impact of adopting the Revised Family Code on women the maximum years of completed education before the adoption of the program.

4.3. Impact of child marriage on women's educational attainment in Ethiopia

4.3.1. Relevance and exclusion restriction conditions

Table 6 shows the first-stage regression result for 2SLS's instrument which fulfilling the instruments' relevance requirement. To successfully overcome Endogeneity problem

caused by reverse causality, measurement error, and omitted variable problems, the IV should fulfill the relevance and exclusion restriction requirements.

Table 6: First-stage regressions

Variables	Child Marriage(1 if married before 18)	Age at marriage (Years)
	(1)	(2)
<i>Adoption of the RFC (IV) (1/0)</i>	-.074*** (.009)	.165*** (.033)
<i>Urban Residence (1/0)</i>	-.024*** (.004)	.034** (.014)
<i>Media Exposure (1/0)</i>	-.025*** (.003)	.050*** (.013)
<i>Size of HH</i>	.006*** (.0005)	-.006*** (.002)
<i>Head of HH (1/0)</i>	-.010*** (.003)	.072*** (.012)
<i>Dummy for time period 2006-2011</i>	-.051*** (.005)	.062*** (.018)
<i>Dummy for time period 201-2016</i>	-.028*** (.004)	.165*** (.021)
<i>Dummy for second group</i>	.147*** (.014)	-.346*** (.051)
<i>Dummy for third groups</i>	.104*** (.011)	-.167*** (.040)
<i>Constant</i>	28.660*** (1.533)	-40.153*** (6.784)
<i>Group specific- linear time trend</i>	Yes	Yes
<i>Individual and household variables</i>	Yes	Yes
<i>Observation</i>	170,682	148,148
<i>R-Square</i>	0.07	0.82
<i>F-statistics</i>	65.78	24.77
Source: Authors' estimation ***, **, * one, five, and ten percent significance level, respectively		

Table 6 reports the first-stage results for the instrumental variable estimation. The findings show that adoption of the Revised Family Code (RFC) significantly increased the age at first marriage and reduced child marriage, confirming the relevance of the treatment dummy as an instrumental variable. The first-stage F-statistics exceed the conventional threshold

of 10, indicating a strong instrument (Wooldridge, 2013). The instrumental variable also satisfies the exclusion restriction, supporting its validity for addressing the endogeneity arising from the bidirectional relationship between child marriage and educational attainment.

Table 7: Impact of early marriage on women's maximum years of completed education

Variables	Educational Attainment (Years)			
	Pooled OLS	2SLS	Pooled OLS	2SLS
	(1)	(2)	(3)	(4)
<i>Age at marriage</i>	.109*** (.002)	.592*** (.038)		
<i>Child Marriage (1/0)</i>			-.672*** (.014)	-1.388*** (.409)
<i>Work Status (1/0)</i>	.354*** (.016)	.331*** (.024)	.351*** (.012)	.369*** (.013)

Urban (1/0)	1.839*** (.033)	1.627*** (.161)	2.218*** (.026)	2.164*** (.041)
Exposure to Media (1/0)	1.361*** (.026)	1.712*** (.041)	1.686 (.024)***	1.655*** (.026)
Size of HH	-.049*** (.003)	-.011*** (.004)	-.054*** (.003)	-.049*** (.004)
Age	-.090*** (.006)	-.208*** (.012)	-.087*** (.007)	-.110*** (.015)
Age square	.0006*** (.00009)	.002*** (.0002)	.0006*** (.00009)	.0009*** (.0002)
Constant	1.216*** (.143)	-4.871*** (.472)	3.190*** (.112)	4.088*** (.550)
Dummies for groups	Yes	Yes	Yes	Yes
Dummies for time periods	Yes	Yes	Yes	Yes
Group specific linear time trend	Yes	No	Yes	No
Individuals and households variables	Yes	Yes	Yes	Yes
Observations	126,083	170,036	170,616	170,616
R-square	0.41	---	0.38	0.38
Source: Authors' estimation ***, **, * one, five, and ten percent significance level, respectively				

Table 7 presents the impact of child marriage on women's educational attainment using OLS and 2SLS estimation. The results show that a higher age at first marriage significantly increases women's years of schooling, whereas child marriage significantly reduces educational attainment. The larger 2SLS coefficients compared with the OLS estimates suggest that failing to account for endogeneity understates the true effect

of child marriage on education. These findings support human capital theory, which argues that delaying marriage enables greater investment in education, and are consistent with previous studies reporting that child marriage substantially reduces girls' educational attainment (Field & Ambrus, 2008; Lloyd & Mensch, 2008; Nguyen & Wodon, 2012; Klasen & Pieters, 2012; Parsons et al., 2015).

5. Conclusion and Policy Implications

5.1. Conclusion

Early marriage remains a major global concern due to its adverse effects on girls' education, health, labor market participation, and decision-making power (Parsons et al., 2015; Jensen & Thornton, 2003; Malhotra, 2013). In Ethiopia, about 40% of women aged 20–24 were married before age 18 (EDHS, 2016). To address this, the Ethiopian government revised the 1960 Family Code in 2000, raising the legal minimum age of marriage from 15 to 18 years.

This study evaluates the impact of the Revised Family Code (RFC) on early marriage and women's educational attainment, and the effect of early marriage on educational attainment. It uses pooled cross-sectional data from the four Ethiopian Demographic and Health Surveys (2000, 2005, 2011, and 2016), comprising approximately 170,000 observations. Because the RFC was adopted at different times across regions, the study exploits this staggered implementation using a generalized difference-in-differences design with multiple groups and time periods.

The results show that RFC adoption significantly reduced early marriage, increased the age at marriage, and improved women's educational attainment. After controlling for other factors, RFC adoption reduced the probability of early marriage by 7 percentage points, increased the age at marriage by 0.17 years, and increased completed education by 0.12 years. Urban residence, employment, media exposure, and female-headed households were also associated with lower early marriage and better educational outcomes.

To address endogeneity between marriage timing and education, the study employs instrumental variable estimation. The findings indicate that delaying marriage by one year increases women's completed education by 0.59 years, while marrying before age 18 reduces educational attainment by 1.38 years. These results confirm that strengthening and enforcing the Revised Family Code can substantially reduce child marriage and improve women's educational attainment in Ethiopia.

5.2. Policy implications of the study

The findings indicate that effective implementation and enforcement of the Revised Family Code should remain a government priority to further reduce child marriage and improve women's educational attainment. This requires adequate financial and human resources, supported by strong monitoring and evaluation systems.

The positive effect of delayed marriage on education also highlights the need for community awareness programs promoting the benefits of delaying marriage and investing in

girls' education. Special attention should be given to rural communities and collaboration with religious leaders to address social norms that perpetuate early marriage.

Since wealth, employment, urban residence, family size, and media exposure significantly influence educational attainment, policies should expand educational opportunities for rural households, improve access to family planning services, and strengthen educational media programs to support girls' education.

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